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THE BUILDING NEWS

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HISTORICAL ROOFS.

THE Temples of the Pantheon and of Vesta, at Rome, were roofed with bronze; that of the Lacinian Juno with bronze; one of those at Pæstum with a species of porcelain. A glance at this subject will show the marvellous variety of materials employed, and of forms selected, in ancient and modern times, for the covering-in of structures, whether sacred, palatial, or domestic. From the former point of view the variety is, perhaps, even more remarkable than in the latter: metals, clay, coal-tar, cement, slates, enamelled tiles, wood, marble, ordinary stone, indiarubber, guttapercha, and almost every conceivable substance, down to thatch. To this day the French peasant thinks himself never so well protected from the weather as by a double layer of thatch, soaked in tar, just as the workman of the Parisian suburbs trusts in tablets of hemp, similarly treated, which he regards as infinitely better than either tiles or clinker-laid planks of timber. But, of late, the French have popularised, for their farms and cottages, an almost flat roof composed of clay mixed with other substances, such as tan and tar, seaweed and moss, factory refuse, yellow-oak bark, cow-dung, and coal-dust, combinations which to antiquity were, of course, unknown, mixed into a thick, impermeable paste, of no use in architecture, but very valuable for the purposes in which it is employed. The next popular class of roofs in France are composed of terra-cotta, otherwise tiles, as distinguished from slates; but these latter have a history which is not always remembered, apart from that which belongs to them geologically, and with which we have nothing to do. Jean-Jacques Rousseau thought them the most melancholy materials for roofing that could be conceived; but he had never seen the green and violet qualities of Anjou and the Ardennes, which give shelter to the "Church of the Chapel," at Paris, the Baths of Plombières, the Prefecture of Nancy, the Theatre of Bruges, the Cathedral of Amiens, and the oldest edifices of Strasbourg. We do not find them in use among the ancients, however, with whom, on the other hand, the tile was a most favourite adjunct to building—flat or hollow, square, oblong, round, or lozenge-shaped, rough or polished, and in numerous varieties f colour, though usually in one shade or nother of red, depending, for the most part, n the district where the material was dug. or grand public structures, no doubt, they were considered too coarse and humble, as they naturally would be by architects who aspired to cover in their temples and palaces with slabs of marble, lined, at all events, with bronze, or gold, or ivory; but in Rome and at Pompeii we discover these humble and durable appliances to have been very largely, and even generally, resorted to, as they have been also in more recent ages, being infinitely more susceptible of ornamentation of every kind proper to a roof than slates, which, as already suggested, were unknown to antiquity, though recent discoveries have pointed out inexhaustible quarries of them in both Italy and Greece. In the matter of enamelled tiles, the taste of the Middle Ages went a great way, as numerous edifices of the period testify, and there was a project long favoured for roofing, in this meretricious style, the venerable and hoary Cathedral of Troyes, with the Church of St. Nizier, and the Town-Hall, in the same historical city, as if they had been mere wooden chalets of the nineteenth century, with decorated floors and walls, fan-shaped eaves, and miniature Swiss gables. The Romans had larger resources. Since they were ignorant of slate, disdained tiles for their nobler buildings, and were not always able to command marble, they sometimes fell back upon slabs of lava from the south of the peninsula, or gypsum, varying their materials, too, according to whether the roof intended was to be flat or sloping, lofty or low, and, as do the modern Swiss, according to the situation in which it was destined to stand. There could, of course, be no doubt upon any of these points when such structures as the bronze-roofed shrines of Vesta and Juno had to be considered; but antique Italy possessed myriads of edifices, in addition to temples, and they all had, in one fashion or another, to be roofed in. Still, the deepest historical interest naturally attaches to the more historical structures. A long and elaborate argument has been maintained upon the question whether the great Temple of Pæstum ever had any roof at all, and whether it was not designed by its architects to be hypæthral, or open to the sky. Such edifices there were, we know, and multitudes of them, in the classic times; but in this particular instance the point has not been settled to the satisfaction of archæologists. The pavement is composed of huge stone blocks, admirably wrought and exquisitely fitted together; but without the slightest apparent provision for carrying off whatever might have fallen upon it. Therefore, it is argued, there must have been a covering of some sort as a protection against the weather — not seldom raining in that latitude—and the conjecture is on the one side that this was of wood, while on the other it is believed to have been of stone. The Temple of Pæstum, consequently, throws no distinct light upon the general subject, although, as we have said, an idea has been hazarded that the Great Exhibition novelty was, in a different shape, anticipated here, by a roof of semi-transparent porcelain. The subject remains in obscurity. It is almost universally agreed that if, in the attempts which have been theoretically made to restore the Palace of Khorsabad and other Assyrian monuments, the roofs were omitted, it was probably because they were constructed of wood, as numbers of the pillars were also supposed to be; but these roofs in the ancient, as indeed in the modern, Oriental sense, were and are different from the Western European idealisms of them; they were rather eaves, or pent-houses, than perfect coverings—*i.e.*, running round interior courts or quadrangles in gallery form, and, upon this supposition, the amount of *débris* discovered at Khorsabad itself would have been amply sufficient for the purpose. Examples justifying this suggestion, though belonging to a far later date, have been met with in the pagan Temple of Egeria, near Rome—now converted into a Christian chapel—though the roof part of the structure there was unquestionably of wood; while from deep below the foundations of St. Peter's at the Vatican have been excavated tiles of extreme antiquity, which, on account of their peculiar ridge-and-furrow shape, could never have been used as flooring. To this day, indeed, among French manufacturers especially, tiles are classified under two separate heads —the Roman and the Greek.

But the Greeks found a better satisfaction of their genius for art and luxury in cutting the tiles for the roofing of their temples from the solid marble, laying these with such exquisite exactitude as to make them look like an unbroken surface, with all the appearance of solidity. It was from them that the French took their lessons when they roofed with thin slabs of stone the Panthéon and the Arch of Triumph at Paris; and with slices, as it were, of lava, the beautiful structures which abound so in Lorraine, Champagne, Burgundy, Savoy, Guerchy, and Brittany. This material, however, so largely used in the architecture of the

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country, must not—it should be remarked by the way—be confounded with the semi-vitrified substance thrown up from the craters of volcanoes in a state of eruption, and which assumes the same name when cooled and consolidated; it is a flat stone, produced in different thicknesses, which is easily detached, layer from layer, and frequently forms, as it were, the "lid" of a quarry containing treasures far more valuable. In the Departments of Puy-de-Dôme and the Upper Loire it is not uncommon to find "tiles" of this material arranged like fish-scales on the roof, and nailed, like slates, upon the timber framework. But there is no illustration remaining, unfortunately, of those Roman roofs spoken of by Seneca, formed of crystallised gypsum, the transparent yellow scales of which brilliantly reflected and broke the light, transforming it into a profusion of rich colours, which, seen from a distance, in the sun of an Italian day, produced dazzling effects. They were called "peacock roofs," because, says the author, they emulated the radiance of the peacock's plumage. We seek in vain for similar classic associations in connection with lead, so favourite a modern material for roofs, although it is affirmed that the poems of Hesiod were engraven on that substance, so that the ancients must have been familiar with it. It was employed, indeed, for roofing, in the Rome of the Cæsars, and by the early Gauls, when they began to be builders at all. The roofs of Notre Dame and of the Invalides at Paris are principally of this material, as are those of several Parisian markets, though it has, in a large degree, in France as in other countries, been superseded by zinc, though to an even greater extent by glass and galvanised iron, as in the United Magazines, the Market of Saint-Maur-Saint-Germain—the Hospital of Berck-upon-the-Sea, the foundries of the Val d'Osne, and many extensive establishments in Russia; which, however, cannot claim to be historical, except in the sense that the progress of every art and usage constitutes a history by itself. The paving of open terraces with lead or zinc, whether left bare, or covered with marble or stone, or mosaic, has been a practice, especially with Italian fanciful artists, from immemorial days. But, in the strict sense of the term, it can hardly be regarded as more than mechanical, although it is a little surprising to be told, by those who have travelled, that this substance often enters into the composition of such structures as Chinese pavilions and Turkish and Persian domes, less to exclude wet than heat, being occasionally encased in wood, or tarred cloth, or even tarred paper, of an extraordinary thickness, rendered comparatively uninflammable by processes which are, it is pretended, hereditary secrets among those who practise them. But, with reference to the ancients, classically so regarded, though lead, tin, and wrought iron are asserted to have been known to their builders, it is hardly sought to be proved that they were largely in use for the construction of roofs. Still, they are heard of, though the authorities, and their application must, therefore, to a certain extent, be taken for granted. It is much more interesting, however, to turn to the temple of the Lacinian Juno, with its splendid gable, more magnificent than that of Metapontis, which, we know, upon indubitable testimony, was covered in with marble tiles, "in conformity," says the classic writer, "with Grecian customs." Under the Roman domination, Fulvius Flaccus, desiring to cover in an edifice—a palace, probably, which he had erected at Rome — appropriated a roof from the Crotonian Temple of Juno. The Crotonians complained, and the roof was restored, though it never was replaced, while the fragments of marble, sawn in small squares, remaining, testify at once to the truth of the history and the fashion of architecture at that time. The Temple of Diana, at Magnesia, was also thus roofed in with slabs of marble, each of them with a sculptured ornament running along its edges, to conceal the line of junction. A plenitude of decorative work and wealth and luxury was lavished upon this structure, parts of which, if archæologists are to be believed, may still be studied, in admirable imitations, in the roof of the ancient palace of the Princes of Bologna. It was then, we are told, that the sides and ends of roofs were first adorned with sculptured figures; but this is more than doubtful, notwithstanding that we have the unreserved assurance of M. Littré—whose knowledge none can question—to the contrary. The images of fanciful "Victories" and idealised "slaves," however, could never have been very much in true accordance with the notions of the purer Greeks and Romans when they constructed a roof, no matter whether for a palace or a temple. We look in vain to the textbooks for instructions on the point, but the gatherings of recent investigators are worth, perhaps, after all, the whole body of the textbooks put together. A good deal more natural, perhaps, was the Middle Age predilection for brilliant colours in the roofing of their churches and castles, not less common then with them than they are with the cottagers of the provinces now. The passion which led them to illuminate their books and paint their furniture—where they did not embroider it—brilliantly, also led them to colour their roofs gorgeously, so far as was possible, and to pitch them high, so that they might be seen of men. In France, Germany, and England, there are yet extant numerous specimens of this peculiar taste, that rapidly revived, to perish, for a time, more rapidly still. Perhaps the roof of Beauvais was among the earliest declarations of this idea—that a roof should not be sombre, slate-coloured, or only a part of the edifice intended to keep out the rain. An Arab feeling, in this respect, crept into Europe, though it was born in Assyria long before Greece or Rome wrote a page of history, and improved by Rome and Greece long before the Saracens came out of their deserts. The most characteristic features of nearly all old edifices, whether in Europe or Asia, are, it may be said, their roofs, and these, when they date so far back as to justify us in regarding them as historical, depend for their character very much upon their colour.

HIGHWAYS AND ROAD LOCOMOTIVES.

THE rules and regulations under which the traffic of locomotives on common roads is at present carried on will continue only for about six months longer. The Highways and Locomotives (Amendment) Act of 1878 will come into force in respect of locomotives on the 31st of December of this year.

At present every locomotive propelled upon a turnpike-road or public highway by steam, or any other power than that of animals, must be worked by three persons at least, one of whom must precede the engine on foot at a distance of not less than 60 yards, and must carry a red flag, and warn the riders and drivers of horses of the approach of the engine, and he is to signal the driver when it is necessary to stop, and is to assist horses and carriages to pass. The drivers of locomotive engines on common roads are to give as much space as possible for the passing of other traffic. The whistle is not to be sounded for any purpose whatever, nor are the cylinder taps to be opened within sight of any person riding, driving, leading, or in charge of a horse upon the road; and the steam is not to be allowed to attain a pressure greater than the limit fixed by the safety-valve, so that no steam shall be blown off when the engine is upon the road. Every engine is to be instantly stopped when the person preceding it puts up his hand as a signal to the driver; and the same regulation holds good if any other person who may be with a horse puts up his hand in like manner. The speed is not to be greater than 4 miles an hour on any turnpike-road or public highway, or 2 miles an hour through a town or village. A light is to be fixed on each side of the engine in front, during the time between one hour after sunset and one hour before sunrise.

A locomotive may run upon a turnpike-road or public highway until the 31st December next if it does not exceed 9ft. in width or 14 tons in weight, and if the tires of the wheels are not less than 3in. wide for a weight of 3 tons, and an inch wider for every ton or part of a ton more than that weight. But although an engine alone may run under these regulations, the wheels must, if it draws a load, be not less than 9in. wide; and they are to be cylindrical and smooth soled, or used with shoes or other bearing surface of a width of 9in. at the least. As to the wheels being "cylindrical" the meaning appears to be, that the opposite ends of the axles of each pair of wheels, so far as they pass through the naves of the wheels, shall be horizontal; the wheels thus being vertical when upon a level road, and the same distance apart at the top as at the bottom. The wheels of ordinary carts and waggons are not set upon the axles in the same manner; they are farther apart at the top than at the bottom, each end of the axle being bent downwards.

As to "shoes" there have been numerous contentions about the meaning of the word, as applied to the wheels of road engines. Those who framed the Act of Parliament could never, one would think, have intended it to mean the strips of iron placed obliquely on the face of the wheel, as it has been thought it might mean. Mr. Glen, whose book on the Highway, Locomotive, and Turnpike Acts, 5th Edition, 1879, we have consulted for the facts we required, refers to two cases which have been adjudicated upon in respect of the "shoes" of road locomotives.

"A locomotive engine was used on a turnpike road, the tires of the hind wheels of which were 18in. wide, and had bars, known by the names of shoes, bolted obliquely across them. These bars were, 4½in. broad, and were placed 3in. apart. It was contended before the justices that each shoe must have a continuous bearing width of 9in., and on the other hand that the wheels had a bearing surface of more than 9in., taking the measurement across the wheels, as it was shown that never less than 9in.—either of one shoe or of two shoes taken together, was bearing on the ground at one time. The justices having convicted the owner of the locomotive, the conviction was affirmed by the Exchequer Division of the High Court of Justice." (Stringer *v.* Sykes.)

"In a later case the tires were also 18in. in width, but upon them were strips or shoes 9¾in. in width, measured the tire parallel to the axis of the wheels, 3in. broad and 1in. thick. These shoes were placed alternately on each edge of the tire, and in the centre they touched and overlapped one another by about 1¼in., so that there was always a bearing surface of at least 9in. in one continuous width on the road. The owners of the engine were convicted by the justices, and on a case stated it was held that the shoes or bearing surfaces must be uniform, continuous, unbroken, smooth-faced bands, of the width of 9in. at least, round the whole circumference of the wheels; and the conviction was affirmed." (Body *v.* Jeffrey.)

As to the weight which may be drawn by locomotive engines on turnpike roads or public highways, in waggons having cylindrical wheels, they are as follow, over and above the weight of the waggon:—

WEIGHT UPON EACH PAIR OF WHEELS.

Width of Tires of the Wheels.	Weight.
Under 4 inches	1½ tons.
4 inches or more	2 ,,
6 ,, ,,	3 ,,
8 ,, ,,	4 ,,

And the weight of the load is to be made to bear equally upon both wheels.

These weights are for waggons or carts without springs. With springs the weights may be one-sixth more. But if the weight consists of one piece, as a tree, a log of timber, a block of stone, a cable or rope, or a plate or vessel of iron in one piece, the above limits of weight do not apply to it.

If the wheels of a waggon or cart are not cylindrical, the weights to be carried are the same as those fixed by the General Turnpike Act, viz.:—

	Summer.		Winter.	
	Tons	cwt.	Tons	cwt.
For every waggon with 9in. wheels	6	10	6	0
,, ,, ,, 6in. ,,	4	15	4	5
,, ,, ,, 4½in. ,,	4	5	3	15
,, ,, less than 4½in. ,,	3	15	3	5
For every cart with 9in. wheels	3	10	3	0
,, ,, ,, 6in. ,,	3	0	2	15
,, ,, ,, 4½in. ,,	2	12	2	7
,, ,, less than 4½in. ,,	1	15	1	10

It being deemed summer from the 1st day of May to the 31st day of October, both days inclusive.

A road locomotive must not be taken over any suspension bridge, nor over any bridge on which a conspicuous notice is placed by the authority of those who are liable to repair the bridge, without previously obtaining the consent of those persons; and in case the owner of the locomotive and the surveyor of the road or bridge, or the bridgemaster, differ in opinion as to the sufficiency of a bridge to sustain the transit of the locomotive, the question is to be determined by the Local Government Board, on the application of either party.

A locomotive working upon a turnpike-road or highway must consume its own smoke until the end of this year, under a penalty of £5 for every day during which default is made; but when the Act of 1878 comes into force it will be sufficient that the locomotive be constructed so as to be capable of consuming its own smoke, and if the smoke be not consumed as far as practicable the person using the locomotive will be liable to the same penalty. And instead of one of the persons in charge preceding the engine with a flag at a distance of 60 yards, he need then only go 20 yards in advance, without a flag; and he will not be required expressly to warn riders and drivers of horses of the approach of the engine, nor to signal the driver to stop it; but in case of need he is to assist horses and carriages passing. If more than two waggons be drawn, an additional person must be employed to take charge of them. The locomotive on and after the next 31st day of December is to be constructed in accordance with the following provisions:—Not drawing any carriage, and not exceeding 3 tons in weight, it is to have the tires of the wheels not less than 3in. in width, with an additional inch for every ton or fraction of a ton above the 3 tons. A locomotive drawing any waggon or carriage is to have the tires of the driving wheels not less than 2in. in width for every ton in weight of the locomotive, unless the diameter of those wheels exceed 5ft., when the width of the tires may be reduced in the same proportion as the diameter is increased, but in such case the width of the tires is not to be less than 14in. in all locomotives constructed after the passing of the Act of 1878 (August 16), but any locomotive constructed before that time in accordance with the provision of the Act of 1861, which required that the wheels be not less than 9in. in width, may still be used, although it does not comply with the new requirements. The new locomotives are to be, as before, not more than 9ft. in width, or 14 tons in weight; but as to the driving-wheels, the description of their construction is a little different, and certainly plainer, as, indeed, it need to have been. The dubious word "shoes," as applied to any part of the tire of a wheel, is omitted, and it is enacted as follows:—"The driving-wheels of a locomotive shall be cylindrical and smooth-soled, or shod with diagonal cross-bars of not less than three inches in width nor more than three-quarters of an inch in thickness, extending the full breadth of the tire, and the space intervening between each such cross-bar"—meaning the space between every two cross-bars—"shall not exceed three inches."

If an engine be required for any special purpose to be wider or heavier than is specified, provision is made for an application for the consent of the authorities interested. The Act of 1878 also amends the law relating to highways in England. Since the year 1862 the repair and maintenance of parish roads have been much facilitated and improved by the formation of Highway Districts. From time to time since then certain parishes have been combined for the management of the highways under a Highway Board. The surveyor of highways, when confined to his own parish, is beset with difficulties in repairing and maintaining the roads properly and economically, but where parishes are combined for this purpose many of the difficulties cease, and under the Highway Acts of 1862, 1864, and 1878, the incidence of rating falls more justly upon the inhabitants. When a number of parish vestries agree to combine to form a Highway Board—and, indeed, in some cases, whether they agree or not—any five or more justices of the peace of a county may give notice that at the next quarter sessions a proposal will be made to form a highway district. The justices at the quarter sessions may entertain the proposal and make a provisional order to that effect, but to make it valid it must be confirmed by a final order of the justices at some subsequent court. The justices of the peace for the county are "the county authority" in respect of highway districts, and they are directed by the Act to have regard to the boundaries of the rural sanitary districts, so that these and the highway districts may, as far as practicable, be coincident in area, and the rural sanitary authority may be constituted the Highway Board, but not necessarily so. When a highway district is formed, each parish appoints a way-warden—one or more—and these and the justices acting for the county and residing within the district constitute the Highway Board, unless the rural sanitary authority be so constituted, in which case no way-wardens are elected by the parishioners.

The Highway Board takes over from the parishes all rights and property belonging to the parish surveyors, whose office then ceases. The Board must appoint a surveyor for their district, a clerk, and treasurer, and they may appoint an assistant surveyor if need be. The district surveyor acts as the agent of the Board in carrying into effect all the works and performing all the duties required by the Highway Acts, and the assistant surveyor performs such duties as the Board may require, under the direction of the District surveyor.

Until the 25th of March of this year, the expenses of maintaining and keeping in repair the roads of each highway parish within the district were charged separately on each parish, but since that date all expenses incurred by a highway board in maintaining and keeping in repair the highways of each parish are deemed to be incurred for the common use or benefit of the several parishes within the district, and are charged on the district fund, which is contributed by the parishes in proportion to the rateable value of the property in the parish, provided that if the Highway Board think it just, by reason of natural differences of soil or locality, or other exceptional circumstances, that any parish within their district should bear the expense of maintaining its own highways, they may (with the approval of the county authority) divide the district into two or more parts, and charge exclusively on each part the expenses of maintaining its own highways and keeping them in repair.

Any road which has, since the 31st December, 1870, ceased to be a turnpike road, and any road which being a turnpike road may hereafter cease to be such, is deemed to be a *Main Road*, and one half of the expenses incurred by a highway authority in the maintenance of a main road within their highway area is to be paid to them by the county authority out of the county rate. Besides roads which have ceased to be turnpike roads, any highway between towns, or a road to a railway station, or other road or part of a road much used by persons in general, may be declared by the county authority to be a main road, on application being made to them by a Highway Board. On the other hand, where it appears to a county authority that a road which has become a main road ought to cease to be such and become an ordinary highway, the county authority may apply to the Local Government Board for a provisional order to that effect.

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THE KILBURN SHOW.

THE Royal Agricultural Society's Show at Kilburn this year will be long remembered for the unpropitious weather which marred its prospects. Surpassing all former exhibitions in size and completeness, the partial failure of the undertaking is the more disappointing, if we consider that a little more engineering and a little extra preparation of the land surfaces, might have rendered the avenues between the sheds and standings at least passable. Though great efforts were made to render the land drainage perfect, the rains and traffic have so completely cut up the ground, that access to half the standings is impossible to those not provided with top-boots or mud-pattens. To make matters worse, the soil is a retentive clay, which has been kneaded into a putty-like consistency and slipperiness by the vehicular traffic, that renders comfortable walking quite out of the question. It is rather a pity the Society's officers, in view of the rainy prospects in store for them, did not form gravelled paths along the sides of the main avenues, or even plank a sufficient width of the thoroughfares for the use of the public. Dry absorbent refuse, such as ashes or brick rubbish, might have been laid down. The under-surface drainage also is quite inadequate to carry away the surplus water. It is, however, of little avail to make suggestions now, though we are inclined to believe that with very little increased outlay these exhibitions might be rendered a little more independent of the uncertainty of our English climate. If along every thoroughfare a canvas lean-to or shelter were provided for the protection of visitors, and a fairly dry footpath formed upon which to walk, the number of visitors to the show would become less fluctuating than they are at present, and we are sure the Society would be amply recouped by public patronage.

We have already given our readers some idea of the arrangements of the ground at Kilburn. There are many exhibits of interest to the architect, engineer, and builder, and these mainly occupy the central cross avenue running north and south. Entering from Salusbury-road, and passing down the main avenue, our attention is directed to a few excellent specimens of stable fittings manufactured by the St. Pancras Ironwork Company. This firm exhibits a series of seven stalls and two loose-boxes, in which every fitting is shown. Each stall is 6ft. by 9ft. The ventilating ramps and stall divisions are excellent, the lower portion is of pitch-pine varnished, while the ironwork is composed of plain wrought-iron upright bars cast into top and bottom rails. In the bottom rails barrier bars draw out for the complete division of the spaces. The grooved clinker paving and the wrought-iron surface drains are better in many respects than the common clinker, the grooves helping to drain the surface in a thorough manner. The mangers, halter-ties, and stall linings appear to comply with the essential conditions to health—comfort and cleanliness, and we like the olive-green tiles to the head of stalls. The loose boxes are 12ft. square, and are finished with every requisite. Our attention was drawn to this firm's enamelled brackets for harness, and to a capital harness-room table, with folding leaves and drawers, besides a portable harness horse. The fittings for agricultural buildings have much that is new and well deserving the attention of the agriculturist and builder on sanitary grounds. Messrs. Musgrave and Co., No. 84, exhibit also an improved and convertible loose-box arrangement convertible into stalls, and some good harmless stall and angle fittings, cow-house fittings, gates, &c. Messrs. Bayliss, Jones, and Bayliss, of Wolverhampton, show some capital tubular fencing, in which the uprights are of T-section, the bars being either round or rolled flat and ribbed at the edges to give stiffness. The price of an ordinary fence of this sort is 2s. 6d. per yard for 3ft. 9in. high, the standards being about 3ft. apart. The 5-bar fence with round bars have socket joints with a rivet through the ends of bar, the price being 3s. 3½d. a yard.

The stands interesting to the profession will be found in the north portion of the transverse avenue behind the members' club, though the state of the ground is so cut up that many are inaccessible. The sheds of the "machinery in motion" are well worth a visit. Messrs. Chas. Powis, Carter, and Morris, of Gracechurch-street, in Stand No. 474, have some admirable steam-engines, cranes, grinding-mills, &c., but we call particular attention to their "universal joiner" for performing a variety of operations, many of a special kind, for grooving, moulding, tenoning, tongueing, &c. The "estate carpenter," the wood-planing and "truing-up" machine, which will plane and "true-up" scantlings, and the new patent vertical moulding machines will especially interest builders and manufacturers. Some of these machines are very moderate in price. Messrs. F. W. Reynolds and Co., of Southwark-street, in the last-named class of machines, have a very interesting display. We notice two new machines, one a "combination circular and band sawing machine," price £35, and another the patent multiple-action mortising, boring, and tenoning machine, called the "Southwark," price £21. This firm's work is well known to the trade. The "Pulsometer" Engineering Co., in stands 293 and 414, exhibit their excellent steam-pump in a great many forms. One at £20 is capable of delivering 2,000 gallons of water per hour; another at £150, suitable for sewage and irrigation purposes, delivers 52,000 gallons per hour. Mechanical appliances abound. Messrs. Ransome and Co., of Essex-street, Strand, exhibit some patent differential pulley-blocks of self-sustaining power, and some hoisting-gear and lifting-jacks, and their stand (No. 247) is well worth a visit for its many useful appliances. Waygood and Co. also, in stand 421, have a number of hand, gas, and steam lifts at work. Those in want of economical steam-engines, from 1 to 5 horse-power, will find the stand of Mr. Edmund S. Hindley (533), of Bourton, Dorset, worth inspection. These machines are well turned out, are constructed on the vertical principle, and the prices are very moderate. The patent stone-dressing machine of T. Robinson and Son, of Rochdale, will be found extremely serviceable. Gas-engines are plentiful, but the best are those of Messrs. Crossley, Brothers, of Manchester, in stand 571. For pumping, household requirements, lifts, and farm purposes the "Otto" is a capital substitute for steam. We notice some machines for drilling, riveting, and forge purposes; of these, Messrs. Rownson, Drew, and Co., of Upper Thames-street, exhibit a large number, under the trade mark of "Cyclops," stand 564. The manufacture of clay goods is not unrepresented in the Show, and the patent "Albert" of Messrs. John Whitehead and Co., of Preston (Stand 469), must be mentioned, as a machine for making solid and perforated bricks, tiles, and pipes. The action is simple and direct. One of the machines, called the combined 4-process brick and drain-pipe-making machine, hoists the clay, crushes it, pugs it, and manufactures about 20,000 bricks per day. Its cost is £280. The "double-process" is a very useful and economic brick-making machine.

Building appliances are numerous. We can only in the present article mention a few of the more conspicuous stands. Messrs. Dennis and Co., whose horticultural buildings we have lately referred to, exhibit one or two interesting structures. We particularly remark an octagon conservatory already sold, in which the wood framing is massively treated, and the design is noticeably superior to the ordinary run of these buildings. At the angles cast-iron pilasters are introduced, and the lights above transom are made ornamental by the introduction of iron panels. This firm has just introduced new patent brass furniture for doors, a clever and simple means of screwing and unscrewing the handles, instead of the present clumsy and unsatisfactory method. Their registered adjustable spindle for bath cocks is exhibited, and we have every confidence in saying it is a useful expedient in saving labour, and may be applied to all ordinary bath cocks. The new "wall tree cover," by Rivers, is another speciality introduced by Messrs. Dennis and Co., affording admirable ventilation as well as protection of fruit-trees. Those who pay a visit to stand No. 677, will be interested in other exhibits pertaining to horticultural and sanitary purposes. New kinds of roofing are numerous. Mr. W. E. Rendle has a large model roof (stand 670), showing a specimen of his patent system of glass-roofing, which is too favourably known to our readers to need comment. This system does away with all putty, and has been successfully applied to many recent buildings and is now adopted by the Government. The "combination system" is certainly a good one for flat roofs and skylights. Messrs. Cranston and Luck (672) exhibit one of their well-known conservatories with open roof. The size is 25ft. by 14ft., and the price is £60. The glazing and ventilation are perfect. In the same group of exhibits we may mention W. Richardson and Co.'s (Darlington) Patent Horticultural Buildings, the most noteworthy feature of which consists in the mode of ventilation adopted. The ventilators are narrow panels or widths of the glass roof, which are acted upon by levers. These ventilators are placed about 5ft. apart, and may be regulated with a nicety. The section of bars is cleverly arranged to allow all leakage to flow away by the grooves upon each side. In addition to the roof ventilators, there are louvres below the upright lights, which can be opened for the admission of fresh air, the whole being acted upon by a rod and lever. Messrs. Peirce, Horley, Rosser and Co., Parham, &c., are also exhibitors in this department. In roofing, we must note Messrs. Major's exhibit of roofing-tiles, made with an angular corrugation. The red tiles look well, and are 140s. per thousand. They are manufactured at Bridgwater. Messrs. Morton and Co., Dixon, Colthurst, Matthews, Croggon, Treggon, Unite, and others show specimens of roofing and felts. In concrete construction, we find a model of a house, and for barn-flooring Wilkinson and Co.'s specimens will be found suggestive. The granite concrete floor at 3s. to 5s. 6d. per foot super. laid complete is suitable for all farm buildings. We are surprised to find concrete construction confined to so few competitors, as the material has indubitable claims for agricultural works.

For ironwork and fittings generally the stand of Messrs. Barnard, Bishop, and Barnards, of Norwich, No. 95, is particularly deserving attention. Garden implements, such as barrows, tanks on wheels, chairs and stools, umbrella canopies, lawn-mowers on an improved plan, are too numerous to mention. We may draw particular notice to some improved hurdles with T iron top and ends, continuous fencing, slow combustion stoves, stall and box fittings. The latter are to be obtained in sets or separately. Messrs. Ewart and Sons' "Empress" ventilators, stand 35, are particularly worth a look, and are suited for stables, shops, and buildings generally; the prices vary from 14s. to £16. For ornamental ironwork the Coalbrookdale Company maintain their well-deserved reputation. The stand 694 is at once seen in the north avenue, for the light blue fountains and ornamental castings it contains. The centre fountain is a masterpiece of casting, and the design is not unworthy of this Company's work; the price is £597 10s. There is a drinking-fountain and five naiads in basin. A small fountain for a suburban garden may be had at from £3 15s. to £8. The vases, flower-stands, candelabra, entrance gates, &c., are in great variety. Agriculturists and others may find a capital specific for horses in Elliman's Sons and Co.'s (of Slough) Royal embrocation for horses (stand 680); automatic measuring and weighing machines of new construction enlist our attention in the stall, No. 78, of Messrs. J. and E. Hall, of Dartford; Mr. C. L. Hett, Brigg, Lincolnshire (452), contributes some useful specimens of 2½-horse-power horizontal steam-engines that may be turned to use in various ways, besides some centrifugal pumps, a self-acting hydraulic ram in action, all of reasonable prices. Amongst sanitary appliances, Moule's earth-closets in various forms are to be seen in stand 328. The closet receptacles of white earthenware and galvanised iron are all that can be desired, so are the earth-sifters—a very useful contrivance for separating ashes from cinders. Sanitarians would do well to make themselves acquainted with this stand, also the next (329), of the Sanitary Appliance Company, Salford. Mr. Isaac Shone's sewage ejector may be seen at work in stand 565. Messrs. A. Ransome and Co., of Chelsea (No. 506), send some useful machines for jointing staves for butter firkins, turning and bevelling their heads, trussing, &c.; and we must not forget among the building appliances a capital stone-moulding and planing machine, exhibited by Messrs. Western and Co., of Lambeth (No. 463). We may here mention in connection with the ground that Messrs. Nicks and Co. were the contractors for the supply of the timber.

Those interested in farm architecture, should visit the building set apart in the main avenue for plans of homesteads. The

Society offered four £50 prizes as follows:—For arable farms above 300 acres; for arable farms not exceeding 300 accres; for dairy farms above and not exceeding 100 acres. The plans are on an eighth scale, and are furnished with specifications and priced quantities. In our hasty visit we were astonished to find a very numerous collection of designs for these four classes. In the main the plans are generally based upon the arrangements we lately illustrated in the Building News, which were exhibited in the Dairy Show at Islington. Class I. comprises a few admirable plans and architectural arrangements. "Practice with Economy" has four yards, and the buildings are arranged so as to fence themselves in forming their own roadways. The food-preparing sheds are placed in one range on the north side with three transverse rows inclosing the yards, which are for eight to ten beasts. The section shows the yard covered with timber and iron-tied roofs, well ventilated. "Under the Harrow," for a farm of 900 acres, the arrangement is similar, but there are five parallel blocks, the fattening-boxes being central and the yards adjoining covered. The plans are neatly drawn. "Invicta" is the motto of an admirably conceived and drawn arrangement, shown by a pen-and-ink bird's-eye-view in an old English style, simple and suitable. The plan is arranged on three sides of a square, on the north being the barn, machine-room, engine-house, granary, &c., on the east, the cart-horse stables and cattle byres, and on the west side, cow-shed; a roadway is formed inside, surrounding the yards and fattening stalls. The yards are open, but an economical distribution of the apartments is one of the features of the plan. The buildings are of white bricks, relieved by red dressings and tile roofs. Another noticeable plan is that of "Colonicus," shown by a coloured perspective; the plan is a parallelogram with seven parallel roofs inclosing the yards. The mixing-room and tramways are well planned and the stalls for twenty beasts. The yards are divided by pillars. The estimate is £2,686. "Ingenuas didicisse fideliter artes emollit mores nec sine esse feros," is a rather complex plan with covered yards, but not without merit. In the same class we note several other designs of a practicable kind, displaying skilful arrangements. "The Eye of Master is Necessary to the Economy of Labour" endeavours to carry out the motto. Open and covered yards are provided, the latter forming three parallel roofs in centre. The stable and cow-houses are well arranged on the north side. We may name also "Experience with Economy," "O Forunata Agricola," &c., "Progress," "Speed the Plough," "Perseverance," "Utility," "Palmam qui Meruit," "Sero sed Serie," as others deserving notice. The latter is a cleverly-treated brick design, with suitable brick elevations, and with well-disposed offices and roadway round three sides of a square. Class 2, for farms not exceeding 300 acres, contains some economical plans, among the best of which we must place "Colonicus." The plan of buildings forms the usual letter ⊓, the stalls and feeding-passage being the centre block, and the stable and piggeries the two lateral wings, covered yards, 37 by 30ft., being between. This arrangement, for a farm of 95 acres, has certainly the merits of simplicity and economy in its favour. The design, "Ingenuas Didicisse Fideliter," &c., by the same author as that in Class I. is a sensibly-treated red brick homestead, Gothic in detail. Covered yards are provided on each side of the cattle stalls, and a tramway gives access to the surrounding buildings. "Labour," "Royal Oak," "A. One," are all clever modifications of the compact system. The last shows some well-treated brick elevations. For the dairy farms we must note "Cheddar," "Nil Sine Labor," a curious octagonal arrangement of sheds and dung-pit, "Utility and Economy," "Cheshire," very artistically handled in the elevations of red brick and timber framing; "Conjuncte," "Palmam qui Meruit Ferat," "Colonicus," "Pressi Vaccinia Copia Lactis," and "Buttercup." Most of the authors of these adopt a three-block arrangement, with covered yards between. The plans of the next class are based upon the same system. Of these we may mention "Palmam qui Meruit Ferat," the cattle-yards of which are excavated; "Colonicus"; "Agellus"; "Royal Oak"; "Stilton Cheese"; "Method and Regularity"; "Good Food and Warmth"; and "Pro Bono Publico," as the most meritorious arrangements.

THE PARKES MUSEUM OF HYGIENE.

A MUSEUM of a thoroughly practical kind, having a more than ordinary claim upon the public and the profession, was formally opened last Saturday afternoon by the Home Secretary, the Right Hon. R. A. Cross. The proceedings, though of the usual character, were marked by the presence of several eminent men, distinguished in the promotion of sanitary science. Of the addresses, though many did not rise above the commonplace and the congratulatory, a few dealt with the practical bearings of sanitary knowledge. The report read by Dr. Poore, the hon. secretary, gave a sketch of the history of the museum, the initial steps of which were taken directly after the death of Dr. Parkes, in the spring of 1876. At a meeting held at Mr. Erichsen's residence it was resolved to give the memorial a practical shape and at a subsequent meeting, under the presidency of Sir William Jenner, it was decided to establish a museum of hygiene. An executive committee was formed, consisting of gentlemen of various professions, and among them the professors of hygiene, architecture, engineering, and chemistry of the University College, besides a fair proportion of physicians and surgeons, and with the modest sum of £520 in hand the committee set about the work. We observe the names of Sir William Jenner, Bart., M.D., chairman; W. H. Corfield, Esq., M.D., Professor of Hygiene; J. E. Erichsen, Esq., F.R.S., Professor of Clinical Surgery; A. B. W. Kennedy, Esq., C.E., Professor of Engineering; T. Hayter Lewis, Esq., Professor of Architecture; and several medical professors. The difficulty of finding a suitable locality for the museum was, at least, temporarily overcome by the offer of the the Council of University College, who placed the present rooms at the disposal of the committee. These rooms form the upper floor of one of the wings, and the chief obstacle, doubtless, to the success of the museum is the inconvenience of having to ascend two flights of staircases. Notwithstanding these preliminary difficulties, the report speaks encouragingly of the support that has been received from various departments, such as books and material from the Admiralty and War Office, sanitary reports from the Secretary of State for India, the Lords of the Council of Education, Local Government Board, Registrar-General, besides contributions from the Government of the United States, City of Brussels, &c., and many private individuals. Mr. Cross's address dwelt upon the general objects of the museum and the value of the diffusion of a practical knowledge of sanitary science among the working classes. He spoke of the degrading circumstances in which some of them lived, and justly condoned much of their drunkenness from the want of education and the miserable condition of their habitations. In proposing one of the resolutions, Viscount Cranbrook very fairly intimated that the education of these classes in sanitary matters must begin from above, that the upper classes must set the example before the working man could be expected to follow. To attempt to teach the lower orders when the classes above them are themselves indifferent to what constitutes healthfulness, is perfectly futile, and is like the blind leading the blind. Sir W. Jenner, in proposing the vote of thanks, showed that the upper were not far in advance of the working classes in sanitary matters. In a speech of much fervour, Sir William severely dealt with those who were engaged in looking after sanitary works, saying they knew nothing of them, an allegation that unhappily applies to architects among others. One sentiment we certainly think every sanitarian will echo, namely, that if we could pay more practical attention to sanitary matters and less to war, there would be an improvement—an opinion that was heartily shared by the assembly. Professor Huxley also, in a few observations, lamented the inattention of Government to educational matters, and hoped the Home Secretary would use his influence to stay the unfortunate movement which has set in, and which appeared to dam back the tide of education and prevent the very classes which science ought to reach from profiting by it. Education must commence at home, but where the home is uncomfortable we cannot expect outward agencies to have effect. Cardinal Manning's aphorism, that nothing cripples more than bad dwellings, may be well laid to heart by all reformers; and we believe the museum inaugurated in Gower-street can do much in showing how intimately connected health and comfort is to the house and its surroundings.

The museum—at present a mere skeleton, a bare outline—is arranged under the following six classes or groups:—1, Engineering and Local Hygiene; 2, Architecture; 3, Furnishing; 4, Clothing; 5, Food; 6, Preservation and Relief; and the aim of the committee has been wisely limited to the attempt to illustrate visually the various branches of practical hygiene as treated of in Dr. Parkes' work on that subject. As a very necessary addition, a library is contemplated. Every appropriate means is intended to be taken to promote the general and practical knowledge of hygienic science, and the committee invite the contribution of books, pamphlets, statistical tables, models, maps and charts, drawings, plans, elevations, and sections of buildings and sanitary improvements, appliances of a mechanical and sanitary nature, articles and specimens of food. We may congratulate the committee upon the first fruits of their labours. Hygienic science is so indissolubly connected with construction and architecture that it is not surprising to find the exhibits under classes I. and II. occupy the largest space in the embryo museum. Class II. is even more numerous than we expected to find. Town drainage and water supply is at present but meagrely represented, though we find several valuable contributions towards these branches of engineering. Thus, for example, the complete set of drawings illustrative of the main drainage of the metropolis, by Sir J. W. Bazalgette, C.B., is a most important donation. These comprise the contract drawings and details of the low level sewer and the southern outfall works, the north side and low level sewer with outfalls and reservoir, and works at the Abbey Mills and the Western Pumping Stations. Sir J. W. Bazalgette also has sent a complete set of contract drawings of the Thames Embankment. In this class many desirable objects might be laid under contribution. Charts showing the average rainfalls of districts, their watersheds and geological structure, the averages of temperature, the death-rate of various towns, topographical information, maps and models of drainage works of towns, paving and road-making, processes of precipitation, deodorisation, irrigation works, and everything bearing on sanitary improvement might be usefully included. Local hygiene, as promoted by engineering works, would naturally form a very large class of exhibits. Another not less important group relates to house arrangement, construction, sanitary appliances, and class II. is as fairly representative of them as can be expected. We are glad to find that the planning and construction of dwellings occupies a conspicuous part of the museum set apart at Gower-street. Mr. T. Twining, of Twickenham, has presented a series of drawings arranged in groups, saved from the Economic Museum of that town. These embrace urban dwellings on the external gallery and internal corridor systems, urban dwellings on the "flat" system with two or more tenements on each floor, mixed dwellings, adapted town houses, model lodging-houses, suburban and rural dwellings, &c. The Metropolitan Association for Improving the Dwellings of the Industrious Classes have presented various plans and models of blocks of their buildings erected in London. We notice, for instance, a model of 4 dwellings in 2 cottages (semi-detached) with separate streetdoor entrances to the two floors; and Dr. Dobell's model of cottages with roof gardens. Hospitals, asylums, homes, and mortuaries are represented in a few drawings; while buildings for educational uses, factories, dairies, markets, slaughter-houses, eating-houses, &c., including many kinds of construction to which sanitary science has been applied, are illustrated. It is rather necessary that care should be exercised in the selection of typical models of these classes of buildings, and we hope this department will be placed under supervision. As supplementary, we might suggest the publication of statistical data and regulations for buildings, and that models or drawings be added periodically exemplifying recent scientific methods of construction.

Mr. T. Chatfeild Clarke, F.R.I B.A., Mr. H. A. Darbishire, F.R.I.B.A., and Mr. Mark H. Judge, surveyor, exhibit some interesting designs for model dwellings. Hospital-construction will, we hope, be largely developed in this class of the museum. One contribution of some interest in this rank is presented by Mr. H. Greenaway, M.R.C.S., of Plymouth. The drawings and models illustrating this arrangement show a long ward or block of twenty compartments, having a longitudinal centre partition with nurse's room, scullery, bath, lavatories, &c., at each end. The peculiarity of the plan consists in side and end corridors forming a lobby to each compartment by which each patient is surrounded with an uncontaminated air, and separated from his fellow-patients. The inner partitions are made of glass, or enamelled sheet-iron and glass with iron framing, and each compartment has a separate supply of fresh air introduced through a grating in the floor, the foul air being extracted by a flue in the centre partition. A model of a one-story building is exhibited. Stoneware damp-proof courses and air bricks, manufactured by Messrs. Doulton and Co., who also send other specimens of their sanitary goods, are to be noticed. We may draw attention to Field's flushing tank, Stanford's joint, channel pipe coping for irrigation, and other improvements introduced by this firm, which are well known to our readers. Mr. Ernest Turner, F.R.I.B.A., sends specimens of defective sanitary work a highly useful and instructive mode of teaching the public the imperfections of their houses, and we hope that this kind of exhibit will be made a feature in the museum. In this category we notice an old-fashioned D-trap of lead, completely corroded through by the action of sewer gas, a contrivance we trust the agency of the museum will aid in consigning to the limbo of the past. In this department of construction, of course, the collection is very imperfect yet, but we would suggest to the committee that unsanitary contrivances which have been discarded should be placed near those improved forms which have superseded them for the sake of public instruction. With this object in view, plainly printed labels should be attached to each specimen, and concise headings and descriptive particulars be prefixed to each sub-class. For example, it would make the improved stoneware traps and ventilating w.c. apparatus more intelligible if, to those specimens already added to the museum the old-fashioned gully and drain connection with the house were placed in convenient juxtaposition; and this method might be extended with considerable advantage to other classes of exhibit. Another suggestion we think might be acted upon with advantage, namely, that the specimens in each class should be arranged in somewhat scientific order; for instance, in the details of house-construction, the methods of drainage, the modes of arresting dampness, ventilation, and general arrangement should be kept as distinct sub-classes and be made to form a connected series.

Of course, sanitary appliances, such as valve closets, ventilating traps, lavatory apparatus, drain-pipes, ventilating arrangements, stoves, gas-burners, &c., make a large show in the collection, and we may casually refer to a few of them. Dr. G. H. Heron presents a model showing an ingenious arrangement by means of which a disconnection of the closet from the sewer can be insured. It consists of a cylinder which fits into the soil-pipe outside the house whenever the closet is in use, allowing the escape of gas to take place above the window. When the flap of closet is closed the cylinder rises and allows the sewer air to escape below, while the cylindrical plug, if we may so call it, being raised, permits the air to enter at its lower end and so pass through and cleanse it. The objection we have to the plan is that a mechanical action is required. Messrs. Wadmore and Baker's ventilating windows, consisting of pivoted sashes top and bottom, are useful for workhouses, schools, and hospitals; in the same class we observe models presented by Mr. P. Hinckes-Bird, F.R.C.S., of his "costless ventilation" already described in our pages; also Currall's "inlet ventilator." Some excellent models of an improved kind of Arnott's valve-ventilators have been presented to the museum by Mr. David Crossley, of Brighouse. These consist of self-acting valves balanced by a kind of weight that can be adjusted to the draught, and applicable to any room where a smoke-flue exists; also screens of a similar construction where flues do not exist. Mr. W. P. Buchan, of Glasgow, has sent models of his "self-acting induced-current ventilator"; we also notice Howarth's Archimedean screw-ventilator, and Messrs. Banner's system. Mr. C. R. Steven's exhaust cowl, and Messrs. Hart, Son, and Peard's contrivances, together with the Sanitary Engineering and Ventilating Company's vertical tube ventilators, Ellison's conical ventilators, and Faraday's ventilating gas pendant, make this branch of sanitary applications tolerably complete and representative. Ventilating firegrates constitute another mode of artificial contrivances. We see Captain Galton's presented by Yates, Haywood and Co.; Mr. Saxon Snell's thermhydric hot-water open firegrate, in which upright coils of hot-water pipe are placed on each side of an open fire, the patent "convoluted" stove, the "gas calorigen," the Gurney, and other forms of heaters. Messrs. Barnard, Bishop, and Co., present their slow combustion stove, and Messrs. D. O. Boyd their "hygiastic firegrate."

Valve and other closets occupy a large space. The specimens exhibited include presentations from Beard, Hellyer, Capper, Son, and Co., Tyler and Sons, Geo. Jennings, D. T. Bostel, Bolding and Sons. The peculiarities of most of these closets are too well known to need description, and we simply draw attention to the "trapless twin-basin watercloset" in one piece of earthenware, Jenning's "trapless Bramah" for preventing waste of water, and improved slop-sink, D. T. Bostel's valveless closet, as combining some economical features in sanitary construction. In furnishing details many improvements are exhibited, such as Messrs. Faraday and Son's gas bracket, Messrs. Tonks' sash opener, and Mr. Saxon Snell's duplex ventilating lids, and some capital school-desks, &c. One word of advice may be offered to the committee in the arrangement of these gifts, namely, the desirability of giving prominence to appliances of simple rather than complex construction. No doubt the committee, in their present position, will find it rather invidious to make distinctions; but they have to consider at the same time that their endeavour is to establish a museum rather than a bazaar.

We have no space left to say anything of the other classes. Class III., devoted to furnishing, is a very interesting group, on which we may have something to record on another occasion; heating-stoves, caloriferes, cooking utensils, filters, lamps, and wall decorations naturally fall under this head, and we should like to see a few well-arranged methods of preventing dampness and of lining walls. Wall-papers, as regards the colours injurious to health and those desirable in certain affections, ought to be represented. Both the last described groups commend themselves especially to architects and engineers, and we hope, when the resources of the museum are more developed, to see such things as walls, floors, staircases, chimney construction, roofs classified upon a scientific basis as regards their fire-resisting, health-promoting, and æsthetic capabilities. Floors and wall surfaces offer a large field for a combination of conditions favourable to hygiene in its widest sense; the effects of wood, concrete, marble, and other floors are deserving of especial study by the promoter of hygienic science, and this establishment cannot better promote the ends it has in view as an educational work than by the exhibition of the every-day objects that administer to our heath, cleanliness, and comfort, aided by a series of demonstrations delivered by competent teachers, so that the public and the working classes may be enlightened upon many things that they look upon now with indifference and neglect, not unmixed with a kind of contemptuousness for their very commonness.

SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS.

THE annual meeting of this Society was held on Saturday afternoon, at Willis's Rooms. The Hon. Percy Wyndham, M.P., occupied the chair, and in opening the proceedings, remarked that the Society had now been in existence for more than two years, and they were beginning to see what their aim ought to be—to change the standpoint from which the general public regarded the question of restoration, so that the burden of proof should lie not upon those objecting to restoration, but upon those who sought to interfere with a building. Too often in church restorations the first expenditure was on choir stalls, cathedral glass, and other unnecessary additions, and then, when the liberality of the people was exhausted, repairs were undertaken, and the decayed oaken roofs were replaced by others in weaker materials. In their endeavours, he claimed that the Society had the public with them. The number of people who cared about architecture in itself was not large, but those interested in the preservation of links connecting us with past history were very numerous. No better proof of the greater value set upon old buildings than upon merely architecturally fine ones could be required by any one than the close fidelity with which restorers endeavoured to imitate ancient work. Till this restoration movement sprang up, those who altered a building never thought of levelling all in a church up or down to the style just then in fashion, and they simply added in the current mode of building, and did not attempt to restore. The Society's aim should be to prevent any alteration of an historic building to suit passing ideas.

Mr. William Morris, hon. secretary, read the second annual report of the committee. It stated that the Society has on the whole no cause to be disappointed with the results of its work, and that the general tone of the public is decidedly more favourable to its principles than when it was first started, while the public Press has of late been unequivocally in favour of the Society. As much of the work undertaken is of a negative character, is preventive rather than creative, it is not easy to show obvious signs of success. The greater part of the work consists in protesting and advising in cases in which there is not much hope of direct success, since such schemes have already gone far before the Society can get to know of them. Nevertheless these protests cannot be regarded as useless, for even where unsuccessful, they breed doubt in some minds that have not hitherto thought of the subject, and dispose those already inclined to treat ancient buildings with reverence, to more thorough care and forbearance in their practical dealings with them. Sub-committees have been formed during the year to carry on the Society's work—these include a restoration and a foreign committee. The latter takes notice of the condition of ancient buildings abroad, and has put itself in communication with archæological societies in France, Germany, Italy, Belgium, and Holland. Inquiries have been set on foot respecting the state of ancient buildings in India, and also in Spain, where restoration is commencing. Steps have been taken to appoint corresponding members in foreign countries, and hon. correspondents in various parts of England, and a quarterly report will be issued to members in future. Reference is next made to the threatened demolition of City churches, and to the necessity for vigilance to prevent a surprise. First of importance amongst the buildings which have been threatened with restoration, is St. Alban's Cathedral, and regret is expressed that the protests of the Society against the scheme for replacing the roof have not been successful; it is mentioned that in their opposition to this scheme, the Society can count amongst those agreeing with its views, many of the most distinguished architects and antiquarians of England. The buildings of Blundell's School, at Tiverton, dated 1599, and among the very best specimens of the school architecture of a school-founding age were threatened with demolition; but the Committee pointed out to the Charity Commissioners and others, the great value of the buildings, and claim to have influenced the decision arrived at that in any case the buildings shall be respected and preserved. "Grasmere Church, Westmoreland, where the poet Wordsworth constantly attended, was threatened with restoration; but a well-timed protest, and a letter written to the patron, had the desired effect. The work of destruction which was just commencing was stopped, the patron having vetoed the whole scheme." Other work of similar character is referred to in detail, and a list given of cases in which protests against alterations have been made by the Society. Instances have occurred where clergymen and patrons have written, asking that a report might be furnished them as to the condition of their churches, and to suggest what repairs were absolutely necessary. In every instance the committee have sent down responsible members to view and report upon the buildings in question. In conclusion, an appeal is made for increased funds.

Mr. Leonard Courtney, M.P., said he had great satisfaction in moving the adoption of this report, as it seemed to him to be a record of good work done and of a great deal of bad work prevented. Even where they had not been successful in stopping mischief being wrought to a building, the remonstrance would prevent other work of similar character being undertaken elsewhere. The City churches had for some years been the prey of a body of people, actuated by the best of motives, who thought it necessary to pull them down in order to provide funds for erecting other churches in the suburbs. He should be sorry if this age could not provide as ample accommodation for worshippers as earlier ones had done. In other cases there were large restoration funds at the disposal of City churchwardens which were applied to alter the character of the buildings in a manner totally opposite to the original designs, and in both cases the vigilance of the Society was called for. While Londoners were in the habit of going to the Continent for holidays, and visiting every church in each town, it was a matter for shame and reproach that they so seldom looked at the fine series of churches erected at their very doors by Sir Christopher Wren, a group of buildings unsurpassed in interest by any in Europe, except, perhaps, those in Rome. The society had been accused of wishing things to go to ruin. He was not in all things a Conservative; he felt it was well that many things should come to an end, otherwise men's lives would be overburdened and crushed down by the accumulation of things of the past. He would say, let dead things go, and let living things be kept as they came from the mind of their creators and not in a fashion totally alien from the minds that gave them birth. There were three things against which the society contended—renovation, transformation, and restoration. In the sister art of painting this was at once felt. If any one copied or painted over a picture, and then presented it as original, the action would be branded as false and immoral. Was it not equally a forgery to alter the character of historic buildings handed down to future generations? He was delighted to find that the views of the society were to be promulgated beyond this country. In France restoration had been carried to a far worse extent than in England, and he feared similar work was being begun in Spain. In India some of the most exquisite and wonderful buildings of the Moguls were being injured by this process. Let them contrast the condition of the temples and other buildings at Futtyporesickwa, where they had been left as ruins for centuries under a kindly climate, with the similar buildings at Delhi and Agra, where the Public Works Department had been at work. They would see that the latter edifices, amongst the loveliest ruins of Moslem art, had been debased and falsified. He was sure they would be able to stop much destructive work of this character by the stir they would make. Most people had erred more from ignorance than design, and even the other class of people, if they found that a large section of the public considered them as Philistines, would be a little abashed.

Mr. Cavendish Bentinck, M.P., seconded the adoption of the report, and said he wished to indicate how the éfforts all desired to make could be most successfully carried out. The first mode was by practising what we preached, and being consistent ourselves. Those who had been loudest in crying down restoration had not themselves done what the Society considered right. He did not wish to allude to one who had passed away, Sir Gilbert Scott, but would confine attention to two gentlemen whose names were mentioned in the report as having joined in the protest against the alterations to St. Alban's Abbey roof, namely, Mr. Street and Mr. Blomfield. He had been that afternoon to the Wellington Chapel, at the barracks, which till recently was a very respectable classical building. Inside it had been slid in, so to speak, a building in the Byzantine-Lombard style, and it had been filled in the rudest possible way with forms of Norman decoration, with goggled-eyed saints and bandy-legged prophets. These had been produced by the firm of Burke, which described itself as a company artistic, Venetian and Roman. He would go a little further west and refer to St. Peter's, Eaton-square, which was built by the late Sir Robert Smirke. Over £20,000 had been spent in turning this into a bastard Lombardic structure. If the two gentlemen referred to had been imbued with the spirit of the report they would not have done anything of this kind; they would have confined themselves to what in the last century would have been called good work. Many in that meeting were affiliated members of the Royal Institute of British Architects. Now he did not think that body had done what it ought. It was very fond of discussing the subject of restoration, but there its members ended. He was glad to see such a strong plea put forth in the report for the City churches. He was himself one of the earliest movers in the matter, for 21 years ago he opposed the Union of Benefices Bill, and though he could not prevent its passing he succeeded in hamstringing it. True, St. Mary at Hill had just been saved by the Society, but the beautiful church of St. Margaret Pattens, in Rood-lane, stood in great danger of being demolished.

The adoption of the report was unanimously agreed to.

Professor Bryce moved the first resolution, "That this meeting, recognising the value of ancient buildings to the student of history, whether general or local, deprecates all alterations in, and restorations of, such buildings which may obliterate their historical character and features." He wished to examine the subject of restoration from the possibly dull but somewhat useful standpoint of the student of history. Among all arts nothing was so certain in their indications of the condition of a people as the ancient buildings. Traditions might alter, chronicles differed, and documents might be falsified, but until recently, within the last thirty years, the character of the buildings could be relied on as a guide in history. Those who had studied the buildings of Continental cities, in which the play of different circumstances had been more marked than in England, must have noticed the marked influence of the architecture of one country on others with which it had intercourse. In France they had architectural evidence of the streams of literary and artistic influence which poured into it throughout the Middle Ages. To some extent this could be seen in England. Our buildings derived their historic value from the artistic symmetry which pervaded them throughout their gradual changes of detail and style. But modern restorers came full of zeal, a zeal not according to knowledge, and reformed away all that the 16th, 17th, and 18th centuries had engrafted on our buildings, putting in their stead what never existed before. When the restorer simply destroyed old work a great loss was inflicted on us, but when he introduced new windows and fresh mouldings, substituted modern sedilia for older work or for walling, two evils were perpetrated: the historic record was partially destroyed and rendered of less interest, and, worse than this, a forgery was introduced into the document. The builder of the 16th or 17th century in altering a building rendered it a register of his taste, either good or bad, but we interfered with an ancient building and sent it down to posterity with a lie in its mouth. In conclusion Professor Bryce spoke of the historical value of the churches, old houses, and companies' halls in the City, and expressed a hope that the Society would be successful in preserving many of these for the edification of future generations.

Mr. William Morris, in seconding the resolution, said the very short-sightedness of the sculptors and artists of the middle ages in depicting all scenes in the fashions and habits of the day had been instrumental in preserving to us most interesting evidences of the mode of living during the periods of English life prior to the diffusion of printed and engraved publications. Not only were these records in danger of being damaged by restorations, but the old schemes of decoration were debased and altered in the process, and the architectural features of the buildings were changed. He also alluded to the useful work carried out by the Society.

The resolution was carried unanimously.

Earl Cowper moved the second resolution: "That the work which the Society has carried out during the past year has been both important and useful, and that in the opinion of this meeting the Society is deserving of continued and energetic support." He referred with expressions of regret to the alteration of the pitch of the roof of St. Alban's Cathedral now being carried out.

The resolution was seconded by the Rev. Stopford H. Brooke, and carried unanimously, and a cordial vote of thanks to the chairman closed the proceedings.

CHIPS.

A new wing has been added to the Convalescent Home, Moretonhampstead, at a cost of £246. Messrs. Parker and Dymond, of Moreton, were the contractors.

Memorial-stones for a new Wesleyan chapel were laid at Hounslow on the 26th ult., with sitting accommodation for 650. Mr. James Weir is the architect, and Mr. Hiscock, of Hounslow, the builder.

The memorial-stone of a new Wesleyan chapel was laid at Barnet on the 30th ult., with sitting accommodation for 1,000. Mr. James Weir is the architect; Messrs. Dove Bros., the builders.

A new swimming-bath was opened on Tuesday at Huddersfield. The plans have been prepared by Mr. Arthur Smith, architect, of Queen-street, Huddersfield.

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ILLUSTRATIONS.

ST. GERMAIN'S CATHEDRAL, ISLE OF MAN.—ROYAL HOSPITAL FOR INCURABLES, PUTNEY.—"BARROW POINT," PINNER.—COTTAGES AT PINNER.—COFFEE TAVERN AT STREATHAM.—ALMSHOUSES AT GUILDFORD.—HOUSE AT KINTAIL.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ST. GERMAIN'S CATHEDRAL, ISLE OF MAN.

The Cathedral of St. Germain's, in former days the actual Cathedral of the Diocese of Sodor and Man, is situated on an island of about 5 acres in extent at the entrance to Peel Harbour, and is connected with the mainland by a modern causeway. This small island is entirely surrounded by fortifications, probably erected during the fifteenth century. Besides the cathedral there is, within the walls, a roofless building of very early date, known as the Church of St. Patrick, and, beside it, a round tower similar to those in Ireland and Scotland; also the remains of the residence of the Earls of Derby, once the Lords of Man, from whose hands the sovereignty of the island passed by marriage into the Athol family, who sold their rights to the Imperial Government at the end of last century. The oldest part of the cathedral is the choir, which was erected by Bishop Simon, 1229, or thereabouts. The other parts are of a much later character. The cathedral consists of the choir, with crypt under it, a central tower, north and south transepts, and a nave with south aisle. With the exception of the foundations the south aisle is entirely gone. The other parts are fairly complete, but the hewn stone dressings are much decayed, chiefly from their not having been laid on their natural bed. Two years ago considerable repairs were made to the arches supporting the central tower and some other portions of the work where it was found to be in a shaky condition. As the diocese has at present no cathedral, His Excellency the Lieutenant-Governor, H. B. Loch, Esq., assisted by the bishop and a committee of Manx gentlemen are making exertions to raise the necessary funds of £10,000 to put the whole building into a proper state of repair, and restore it once more to its original purpose. Mr. R. Anderson, of Edinburgh, is the architect. The drawings we illustrate have been hung in this year's exhibition of the Royal Scottish Academy.

NEW WING TO THE ROYAL HOSPITAL FOR INCURABLES, WEST HILL, PUTNEY.

This building, of which a view and plan are given, is 260ft. in length, and placed at right angles to the present hospital towards the north end. The first stone is to be laid on Monday next, 7th inst., by the Prince of Wales. The accommodation provided upon the ground-floor is shown on the plan—on the basement-floor are the men-servants' and porters' living-rooms and dormitories, and extensive storage and warming apparatus rooms, &c. The upper floors are utilised for patients' wards, and will provide accommodation for about 100 more inmates, the allowance being about 100 superficial feet to each bed, and not less than 1,200 cubic feet of air space. The corridors throughout are to be of fire-proof construction in iron and concrete, finished on the surface with patent Victoria stone and red-tile borders. The upper floors will be approached by a hydraulic lift as well as spacious staircases, and ample provision against fire will also be made. The new buildings have been planned with a view to further extension at some future time, at the end farthest from the present building and to correspond with the same—so that the new wing may be considered as the central block of what the complete Institution will it is hoped eventually become—the proposed new frontage being towards the high road. The contract has just been taken by Mr. Goodman, builder, of Barnsbury, for the sum of £19,988. The architects are Messrs. Searle, Son and Hayes, of 66, Ludgate-hill, E.C.

BARROW POINT, PINNER.

We illustrate this week the drawings by Messrs. Ernest George and Peto, architects, now exhibiting in the Royal Academy Exhibition. The first of these is Barrow Point, Pinner, designed for Mr. Barber to occupy the site of his present house. A characteristic of this house is that it abuts upon the road instead of having the unprofitable front garden of a suburban villa. The road frontage is occupied by the offices, porch, and hall. The latter is carried up through the first-floor, and is lighted by long bay windows above panelled walls, while a gallery running round the upper portion of the hall leads to the bedrooms.

THE STREATHAM COFFEE-HOUSE TAVERN.

Is just being completed and is to be formally opened in a few days by the Lord Chancellor. The architects have succeeded in giving to the building the aspect of a quiet old red-brick tavern. It has a long and quaint bar window above which is a wooden balcony approached from the club-room on the first-floor; on the same floor is a reading-room and a bagatelle-room. Behind the bar is a bar-parlour. The basement is used for storing grocery and other heavy provisions from which a lift carries them to a kitchen, which is at the top of the house; an arrangement that finds favour in modern eating-houses. A smaller lift is provided for conveying speedily chops or other light comestibles. On the second-floor are arranged dormitories to be let as lodgings to working men. At the back of this house is a large hall with separate approaches, and a retiring room for lecturer. The room is lighted by a row of dormers in the roof, and at night by sunburners. A complete scheme of heating and ventilating is provided. The contract for the whole building was £3,838.

ALMSHOUSES AT GUILDFORD.

These houses are being erected for the Earl of Onslow on a site next to the County Hospital. They will form a quaint and pleasant group round three sides of a neat grass plot. Red brick paths inclosing the grass will lead to the twelve doors, a sundial being a feature in the centre of the quadrangle. Each house consists of a good-sized living-room with a long bay window, and a recessed chimney-corner, having in it a settle and a small window. There are also a bedroom, scullery, and outhouses, all being arranged on the ground-floor. Roomy porches are provided with seats where the old ladies may sun themselves. There is a garden behind each cottage for vegetables, and a border in front for flowers.

COTTAGES AT PINNER.

These eight cottages, to be built at the bottom of the old-fashioned village of Pinner, are for Mr. Barber. They consist of a living-room, scullery, and three bedrooms, also the usual outhouses. Each one consists of a living-room, scullery, and three bedrooms, also the usual outhouses. The external timber-work is of oak. The perspective and the plan which we give explain the treatment of the building which, when weather stained, will pass for a bit of the quiet old English village.

KINTAIL, ROSS-SHIRE.

This illustration is of a house for J. T. Mackenzie, Esq., of Kintail, designed for the picturesque neighbourhood of Loch Dinch, in Ross-shire. The house occupies three sides of a court-yard, in the centre of which is the entrance door. The stables forming one side. Owing to the difficulty of obtaining skilled labour in this remote locality the design is kept studiously plain. A large ball-room at one end of the building is for entertainments to the tenants.

COMPETITIONS.

City of London School Competition.—We are glad to hear that a meeting is to be held on Tuesday next, at 3 p.m., at the Cannon-street Hotel, of competitors for the erection of the new City of London School. It is intended to memorialise the Court of Common Council to publicly exhibit the drawings before confirming the award of the Committee, and we trust this most reasonable request will be complied with.

Ipswich New Corn Exchange.—As we anticipated would be the case, the Town Council of Ipswich have decided not to carry out the scheme for adapting the public hall for use as a corn-exchange, and for which the plans of Mr. Horace Cheston were awarded the £50 premium, the reasons assigned being those we suggested in the Building News for April 18th (p. 428 last vol.), that, as lengthened, the hall would be too narrow in proportion to width to meet acoustic requirements, and insufficiently lighted—spoiled, in fact, as a public hall, and not good enough for an exchange. At their last meeting the Town Council decided, by 17 votes to 10, to adopt a comprehensive scheme for building a new corn exchange in King-street, at the side and rear of the Town Hall, with shops and offices on the street frontages. The estimated cost of site is £12,000, and of buildings £17,000, reckoned at 6½d. per foot (surely an insufficient estimate, judging from the post-office and museum competition prices) on the area of 532,236 cubic feet. The committee were authorised to "purchase the site and to order the preparation of a plan of the proposed corn exchange for the approval of the council."

Ipswich New Post-office.—At the meeting of the Ipswich Town Council on Wednesday week the question of the new post-office and municipal offices was considered. Mr. C. Barry's report stated that none of the designs could be carried out for £6,000, the sum stipulated in the conditions; and as to absolutely comply with it the accommodation must be largely lessened or the outlay increased, he believed no injustice would be done to those who said they believed the designs could be carried out at or under £6,000, as he must advise the committee that those who say so were, in his judgment, mistaken. He thought the best design, the one shewing most mastery of architectural treatment with much dignity, and best treating the differing levels of the floors in the two portions of the building, was that of "Well-Considered." The report, on the recommendation of the committee, was unanimously adopted, and the committee were instructed to confer with the author on his plans, and to obtain specifications and tenders. As we announced last week, the successful competitor, who takes a premium of £50, is Mr. John Johnson, 9, Queen Victoria-street, E.C. The payment of £63 was ordered to be made to Mr. Barry for his report.

◆

Professor Virchow, Dr. Schliemann's companion and coadjutor in the latest excavations in the Troad, has written to the eminent Homeric archæologist, informing him of a concurrence of geological opinion at Berlin in the conclusion that all the building stones, fragments of which the Professor brought home from Hissarlik, are of fresh-water formation. This conclusion is thought to be decisive against those who affirm the impossibility of identifying Hissarlik with the Homeric Troy, on the ground that at the time of the great epic war the site must have been covered by the sea.

The survey of Cyprus, which had been intrusted to Lieut. H. H. Kitchener, R.E., who surveyed Galilee for the Palestine Exploration Fund Committee, has been abandoned, for the present at least, for want of funds, and Lieut. Kitchener has returned to England.

ALMSHOUSES for the
EARL of ONSLOW
GUILDFORD
ERNEST GEORGE & PETO
ARCHITECTS

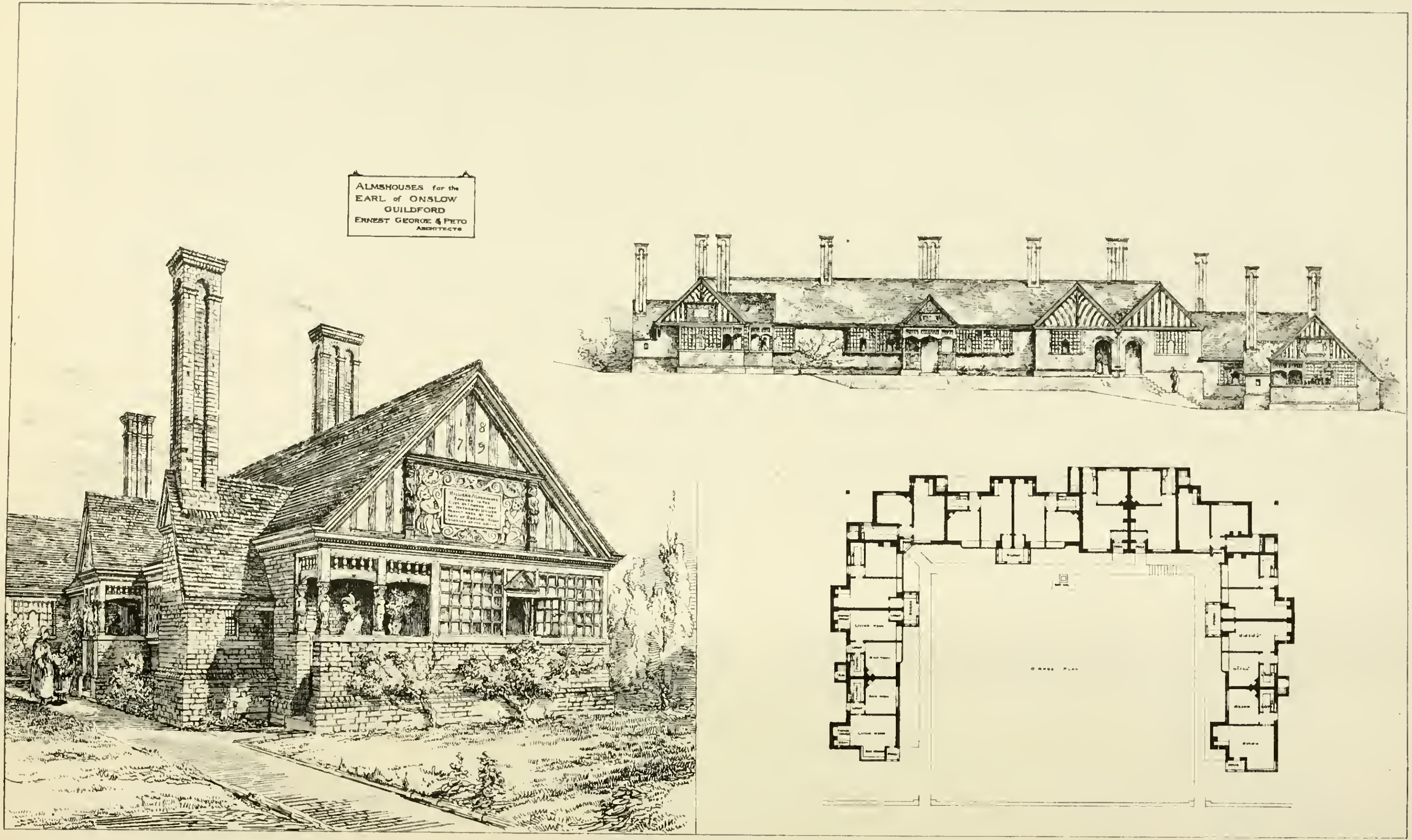
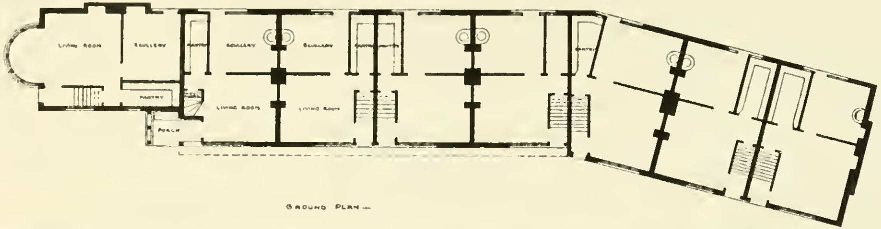
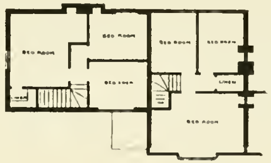


Photo Lithographed & Printed by James Akerman, 6, Queen Square W C

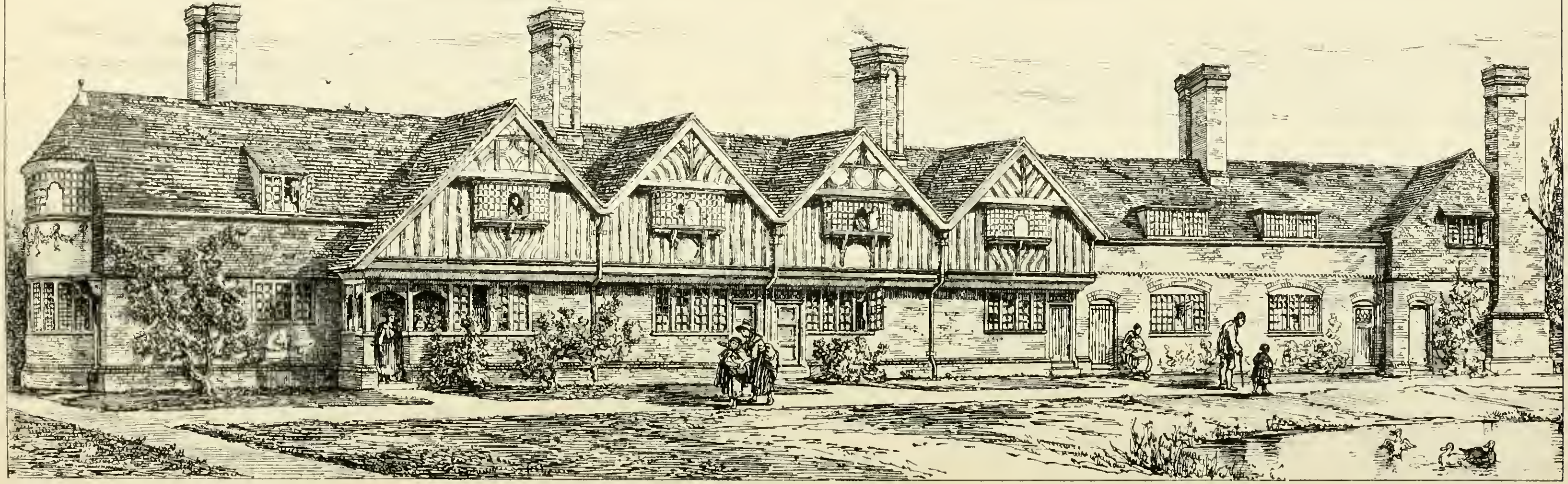


GROUND PLAN



FIRST FLOOR PLAN

COTTAGES, PINNER
for W. BARBER ESQ^re^
ERNEST GEORGE & PETO, ARCH^TS^



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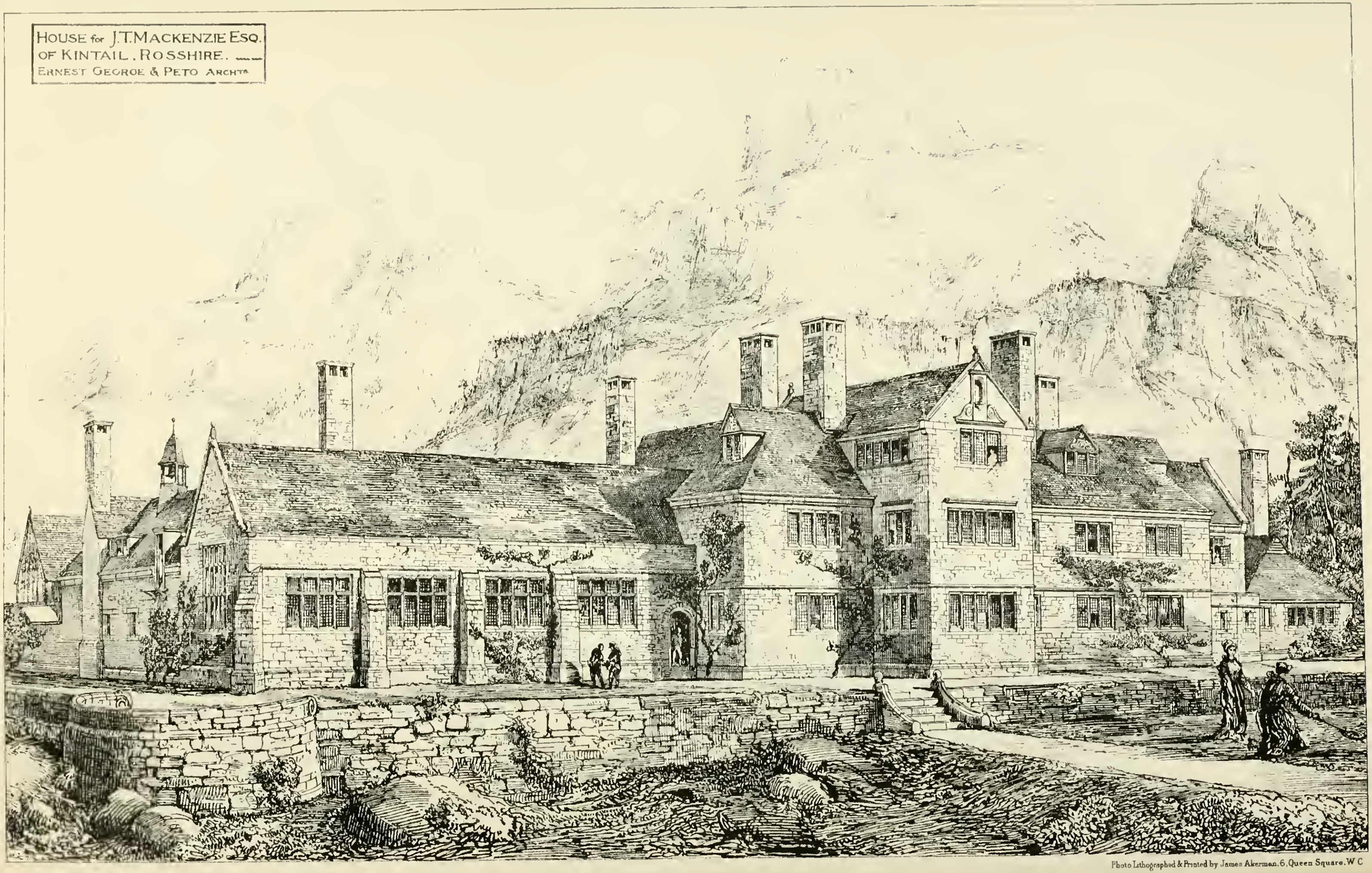
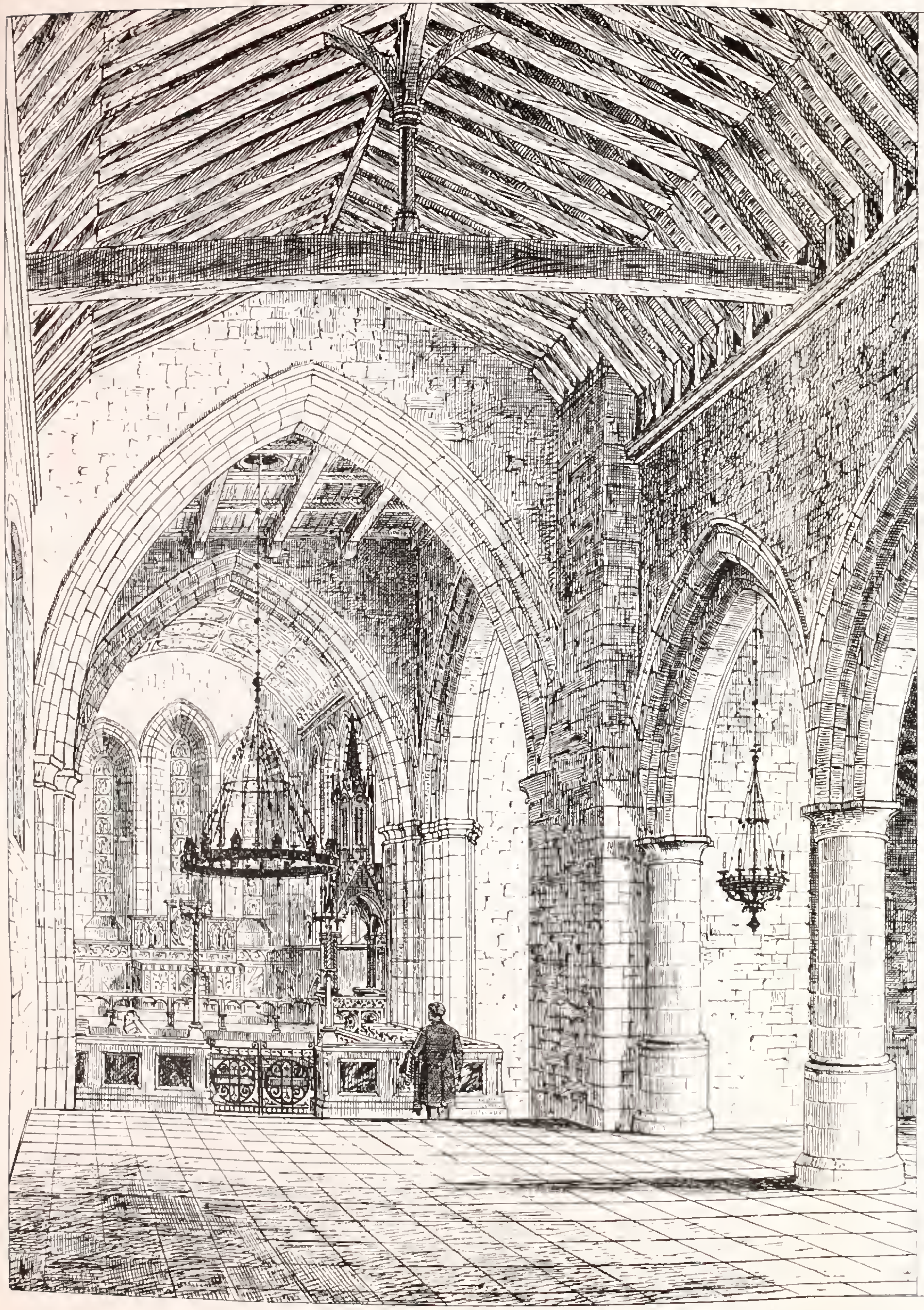
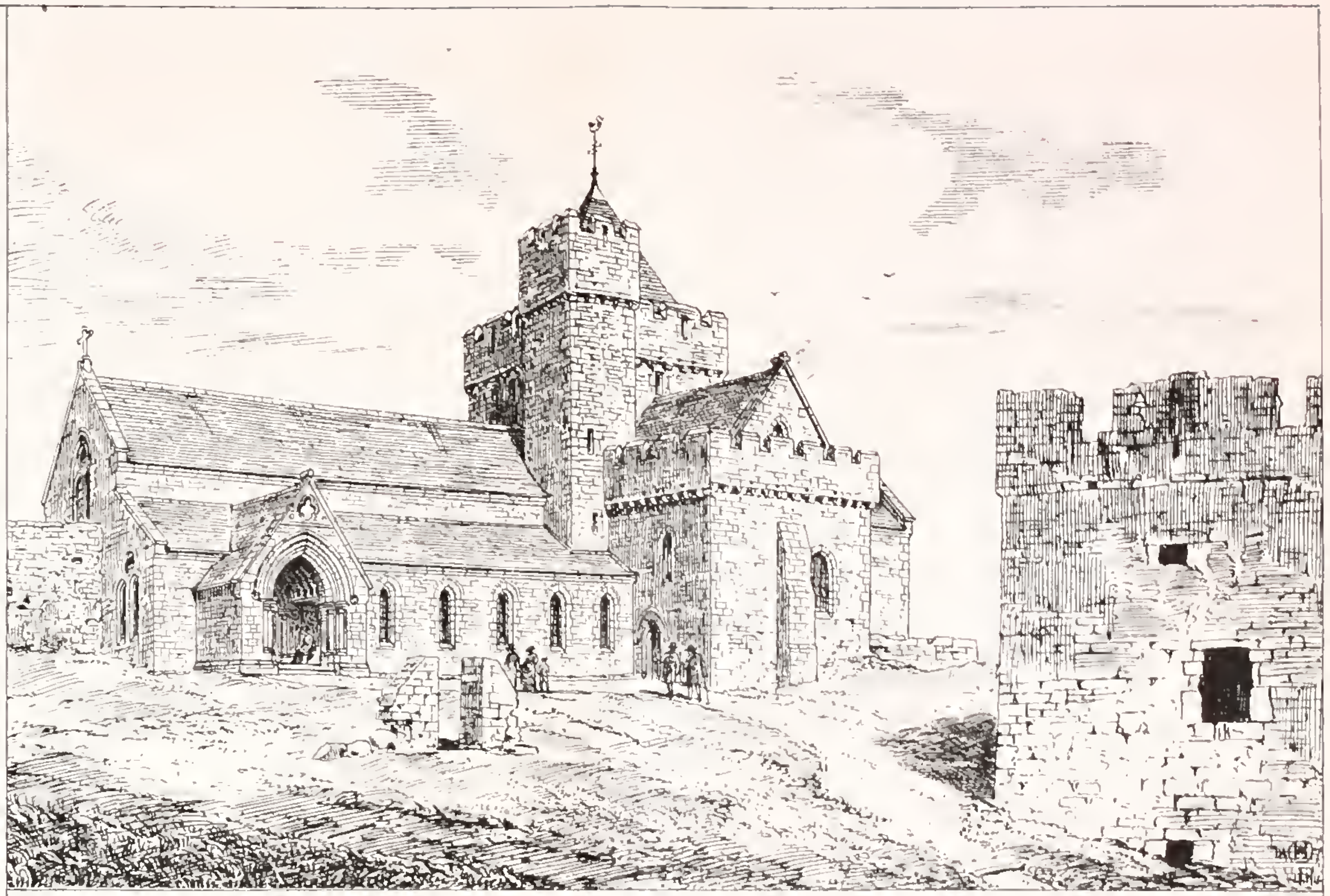


HOUSE for J. T. MACKENZIE ESQ.
OF KINTAIL, ROSSHIRE.
ERNEST GEORGE & PETO ARCHTS

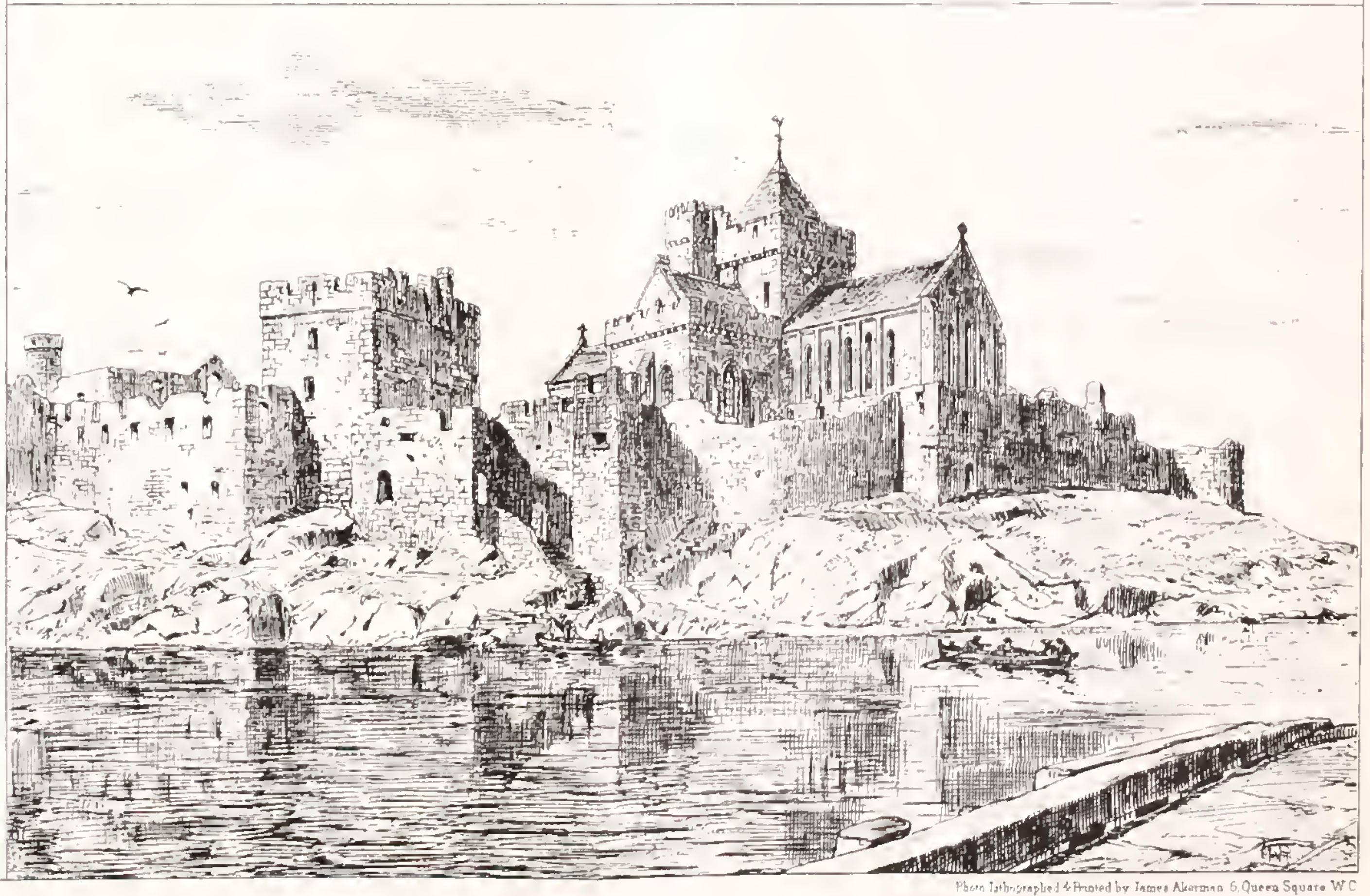
Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C



Interior View-looking East.



View from S.W.



View from S.E.

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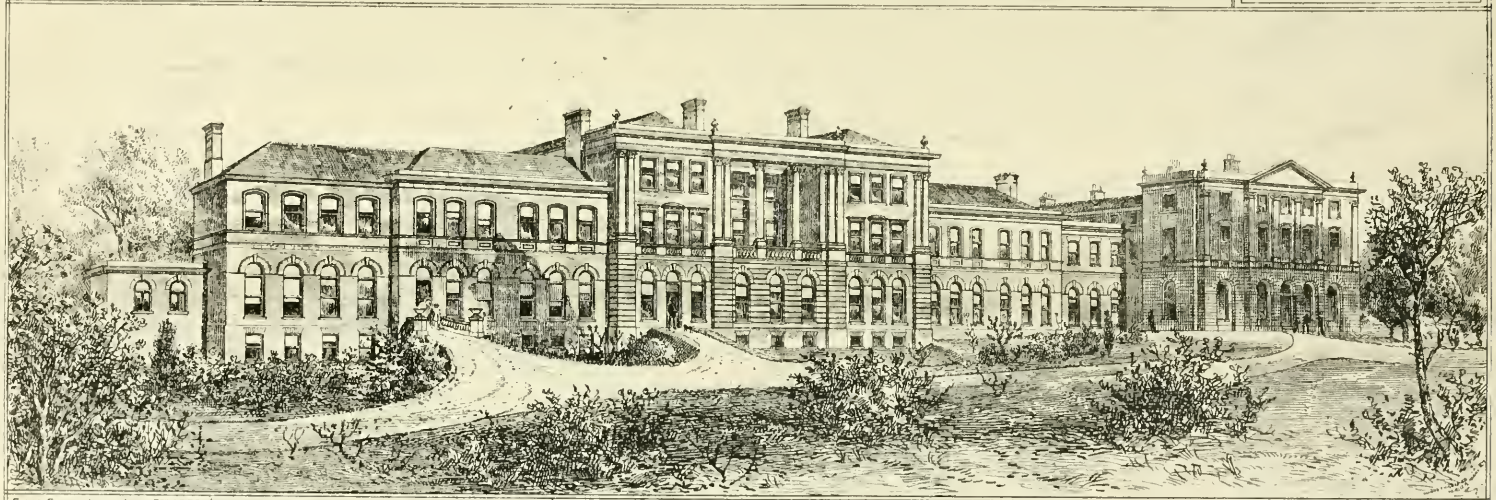
S. GERMAN'S CATHEDRAL ISLE OF MAN

INTENDED RESTORATIONS. R. ANDERSON, ARCHT.

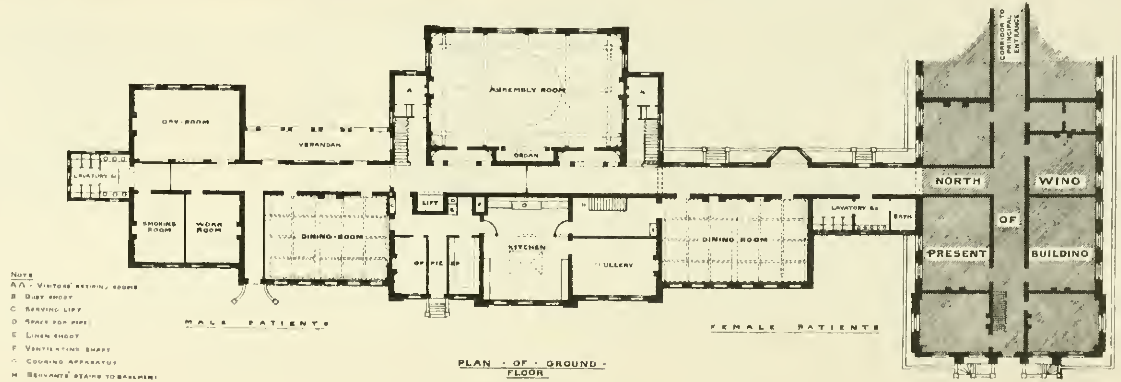
THE · ROYAL · HOSPITAL · FOR · INCURABLES · WEST · HILL · PUTNEY ·



FIRST STONE LAID. JULY 7TH 1879.

· VIEW · OF · THE · PROPOSED · NEW · WING ·

SEARLE SON & HAYES, ARCHTS, 66 LUDGATE HILL EC



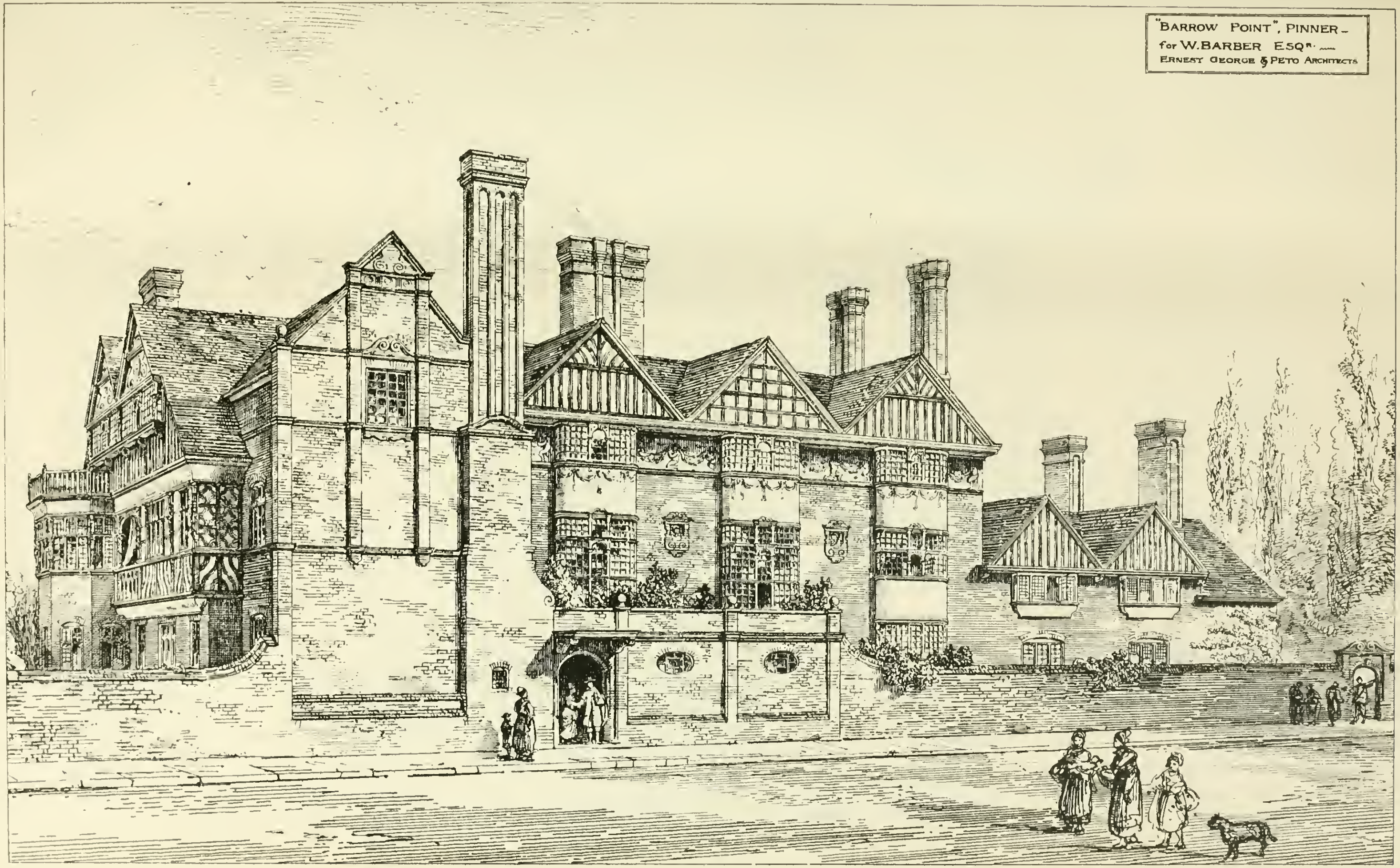
PLAN · OF · GROUND · FLOOR ·

Scale of Feet

NOTE

AA · Visitors' retiring rooms
B Dust shoot
C Serving lift
D Space for pipe
E Linen shoot
F Ventilating shaft
G Cooking apparatus
H Servants' stairs to basement
I · Dinner lift

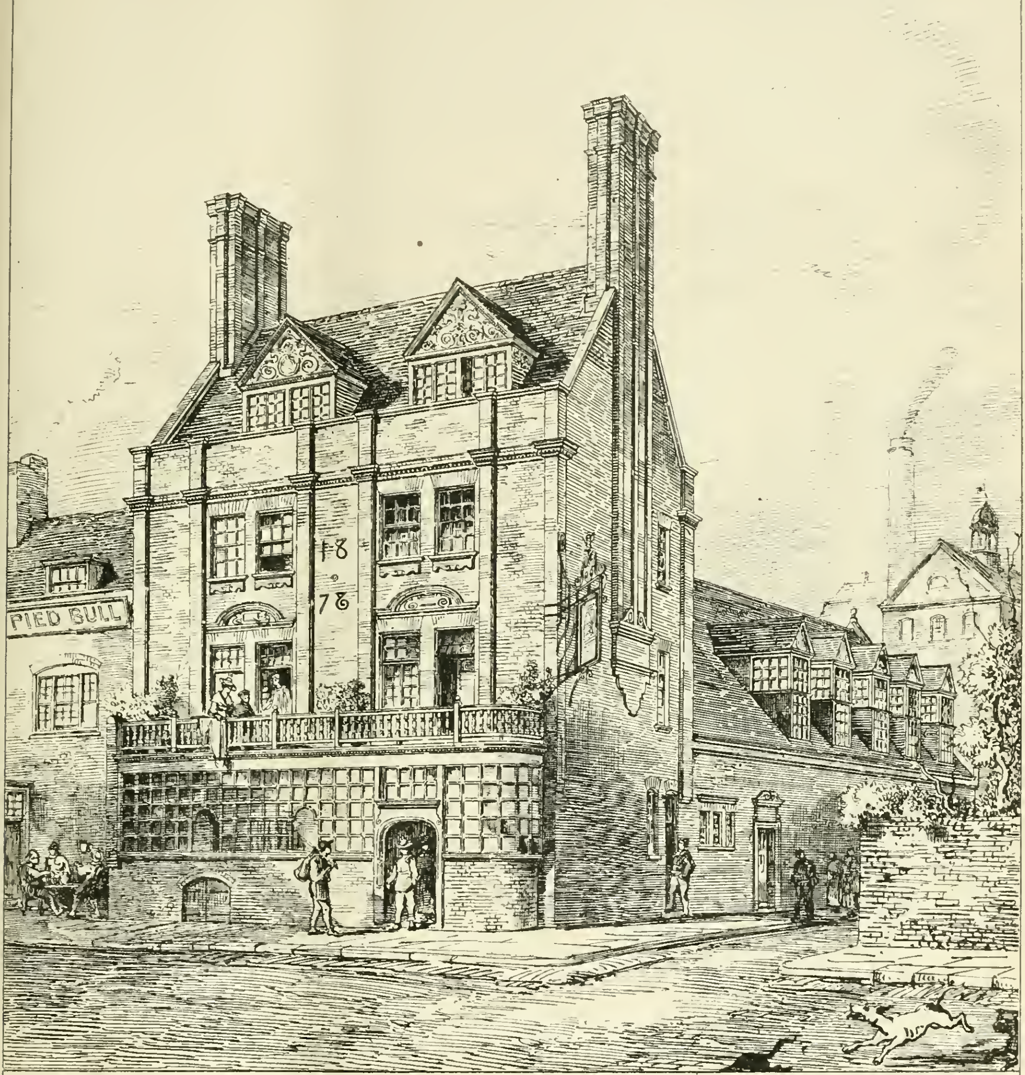
Photo Lithographed & Printed by James Akerman, 6, Queen Square W C

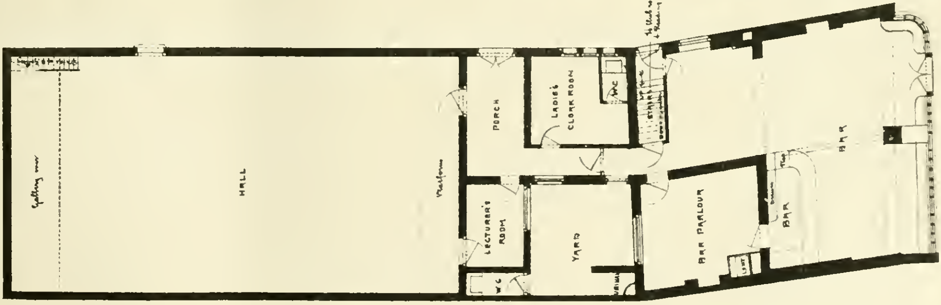


"BARROW POINT", PINNER –
for W. BARBER ESQ.R —
ERNEST GEORGE & PETO ARCHITECTS

Photo-Lithographed & Printed by James Akerman, 6, Queen Square W C

COFFEE TAVERN, STREATHAM
ERNEST GEORGE & PETO ARCHTS.
11 ARGYLL STREET W.





GROUND PLAN

Photo Lithographed & Printed by James Akerman 6 Queen Square W.C.

ARCHITECTURAL DRAWING-INKS.

AT a recent lecture on "Architectural Measuring, Sketching and Pen-and-Ink-Drawing," delivered by Mr. Neale, F.S.A., before the Architectural Association, attention was drawn to a new ink, invented by Mr. Featherstone, of Chertsey, and made by Messrs. Boyce and Son, of the same town. This ink was described as being in every way suitable for pen-and-ink drawing, specially for drawings intended to be reproduced by photo-lithography. We have tested the ink, and find it possesses many good qualities, although we do not consider it overcomes thoroughly the usual objections which have hitherto been found to militate more or less against the adoption of all fluid black inks intended for architectural purposes. It has always been a difficult matter to avoid the deposit of a granular sediment after a small quantity of ink has been exposed to the air for an hour or two, as it must necessarily be when used for practical everyday work. These granular, or perhaps more correctly speaking, film-like, settlements clog the pen, and occasionally cause a thick line when a fine one is intended, and thus render a constant cleaning of the pen necessary. Again, fluid inks easily rub off the surface of the paper, and will not at all allow the use of indiarubber, while in some cases even bread cannot be used. Undoubtedly, the pencil lines, if sketchily put in, often give an artistic finish and tone to a pen-and-ink drawing simply looked at as a picture; but when photo-lithography has to be considered all pencil lines must be carefully removed unless a rotten effect be desired, which of course is but very unusually wanted; indeed the only or rather chief objection to the photo-lithographic process is its tendency to render all lines more or less rotten, and to give a deadened effect to the reproduction. This being so, all drawings intended for the process should be made with firm black and even dead lines. With a view to obtaining this effect, Mr. Featherstone's ink has been produced, and no doubt, as far as this desideratum is considered, he has succeeded, and has obtained an ink which gives a dead flat surface, enriched by a good bluish-black tone. These are advantages, as the blue tone, when not too blue, greatly adds to the blackness, while all lines with care may be made of the same degree of solidity; the latter is a most important point, for unless the drawing be equally black all over, a good photo-lithograph is almost an impossibility, and for this reason, a more lengthy exposure is required in photography to obtain the parts which are drawn in lighter ink, and meanwhile the blacker portions are thickening and becoming blurred. Indian ink nicely mixed, and Morrell's Registration ink, are unquestionably the best inks to use for ordinary purposes where photo-lithography has to be considered, but these inks are also open in their turn to primary objections. Indian ink, if too thick, will not flow freely from the pen, and always has more or less of a bright sheen upon the surface of its lines, while Registration ink has a tendency to be too blue in tint, with an uneven degree of intensity when not heavily used, while heavy use renders it difficult to show delicate detail nicely. And again, if the paper be wetted for mounting, Registration ink will run unless great care be exercised. In any case hard-surfaced hot-pressed papers should be used, and these cannot be too white or free from colour, particularly from yellow. Registration ink has also the objection of corroding the drawing pen, and thus rendering the setting of the pen a frequent necessity. Featherstone's ink, though free from the gloss peculiar to Indian ink, and the blueness of Registration ink, is by far more easily caused to run than either of them. And here is the chief objection to its use, viz., that the warmth of the hand, especially at this time of the year, would play sad havoc with the work first executed on a drawing made with this ink, and judging from our own experiments, we do not see how the drawing could be well mounted without the parts running together, while all lines, as soon as the paper was made wet at the back, would sink into the paper and become dead and heavy in effect. Registration ink drawings, as we have already pointed out, have a tendency to do this unless great care be taken with the mounting. We have thus freely expressed our opinion with regard to Mr. Featherstone's new ink, which, like many other inventions, has its advantages as well as defects. Both of these we have pointed out, and it may be that the inventor or manufacturer will be able to overcome the latter, and so increase the former. If the ink could be made indelible without increasing the likelihood of its becoming more granular and less free from film, then the invention would no doubt supply a great want among draughtsmen; but indelible inks in black as yet are easily rubbed off, for they do not appear to bite into the grain of the paper sufficiently, but remain too much on the surface. Anyway, it is not so much the materials or tools which produce satisfactory results as the thought, care, and ability of those who use them, though, of course, no one can make bricks without straw, or drawings without ink.

LIGHTHOUSES.

THE interest taken in the construction of another lighthouse on the Eddystone Rock has probably turned the attention of many readers to the subject of lighthouse improvement. The Americans have devoted far more study than ourselves to this branch of construction, and the Government of the United States have appointed a board, called the "Lighthouse Board," to undertake the construction and care of lighthouses and signals. Mr. J. G. Barnard, of the U.S. Army, in a recent paper published in the "Transactions of the American Society of Civil Engineers," describes fully the details of several lighthouses, the models and drawings of which were exhibited at the Centennial Exhibition. The author first alludes to the lighthouse on Minot's Ledge, a reef of rocks that lie off the south-eastern "chop" of Boston Bay, which have been the terror of mariners for centuries and the cause of innumerable wrecks. The "Minots," as these rocks are called, are bare only at three-quarters ebb, and vessels bound in with a heavy north-east wind are liable to be driven upon them. The rock is granite, with vertical seams of trap, and the site selected exhibit at low water an area of about 30ft. diameter, and was till 1851 occupied by an iron skeleton lighthouse, erected in 1848 by Captain W. H. Swift. A great storm in April of the former year carried it away. The new lighthouse—the subject of Mr. Barnard's paper—was a hazardous undertaking. The description given of it by the engineer, the late Lieut.-Col. B. S. Alexander, may be interesting: "It was a more difficult work of construction than either the Eddystone, the Bell Rock, or the Skerryvore, for the Eddystone was founded all above low water, part of its foundation being up to high-water level. The foundation of the Bell Rock was about 3ft. above low water, while the Skerryvore had its foundations above high-water-level; whereas a good part of the foundation of the Minot's light was below low water. There had to be a combination of favourable circumstances to enable us to land on the Minot Rock at the beginning of that work—a perfectly *smooth sea*, a *dead calm*, and *low spring tides*. This could only happen about six times during any one lunation, three at full moon and three at the change. Frequently one or the other of the necessary conditions would fail, and there were at times months, even in summer, when we could not land there at all. Our working season was from April 1st to September 15th. Work was prosecuted with all possible diligence, for more than three years before a single stone could be laid. The difficulty was to cut the foundation-rock into the proper shape to receive the foundation-stones and then to lay them." From the plan, vertical section, and elevation of the Minot's Ledge Lighthouse we glean the following peculiarities. It is a circular structure about 88ft. in height, diminishing as it rises, with straight sides, crowned by a lantern 15ft. high. Up to about 40ft. above low water-mark it is built solid around a centre well, while above that the structure is hollow, having a cylindrical space of 14ft. in diameter, and of five 8ft. stories in height. At the top it is domed at the level of the cornice. The section shows the main structure, thus divided into two equal portions of 40ft., the lower being solid and the upper hollow. The diameter at the base is given as 30ft. and at the top of solid part, 23ft. 6in. Four iron floors divide the stories, and these and another immediately below the lantern are the keepers' rooms. The elevation is certainly wanting in the beauty and grace of outline of the Eddystone, but the spreading base employed by Smeaton could not, it is alleged, have been adopted in the Minot's structure, as the limited area prevented the expansion required. The stonework is bonded together at the base in irregular-shaped stones, the natural rock in the centre being covered by the third course, which consists of radiating stones, with the triangular spaces filled in with cross stones, joggled into the former much in the same manner as in the Eddystone. Eight iron shafts or dowels rise from the rock in which they are embedded into the structure round the base, and are carried up through twelve courses of masonry. Gun-metal dowels were used to secure the courses of the solid part and to prevent sliding action: while of the masonry of the hollow structure, the courses were joggled into each other by square grooves and tongues, or by a middle annulus upon the upper face of each course. The work commenced in 1855, and was continued with interruptions till 1859. The height of focal plane above lowest point is 96ft., and the total height to top of pinnacle 114ft.

The Spectacle Reef Lighthouse was another structure of a similar kind. It is not properly a sea-rock lighthouse, but it was built to encounter ice-packs. It stands upon a reef on the north of Lake Huron, off the eastern end of the Straits of Mackinac, upon a limestone rock covered with a layer of boulders, and the position of the shoals has suggested its name. This structure is exposed to south-easterly waves and a range of sea in this direction of 170 miles. Under certain conditions, currents with a velocity of from 2 to 3 miles per hour have to be withstood, and large ice-fields, frequently of thousands of acres, and as much as 2ft. thick, moving with this velocity form a force almost irresistible. The aim of the engineer was to build a structure that should oppose the impinging ice crushing against it, and that the barrier should aid in packing the ice till it should ground upon the shoal itself. The necessity for this was made evident by a packing of ice against the lighthouse in the spring of 1875, when the ice was piled up against the structure to a height of 30ft. above the water. A crib work, filled with ballast, was first formed round the site of the tower, about 92ft. square, inclosing a square opening of 48ft. This formed the landing-stage, and secured still water for a coffer-dam of cylindrical form, 36ft. in diameter, made of staves 4in. thick, 6in. wide, and 14ft. long, held together by iron bands on the outside, and braced together internally. After pumping out the water, levelling the bottom, and laying the first course, the annular space between it and the cylinder was filled with concrete, thus making a watertight bottom. The lighthouse is shown as a frustum of a cone 32ft. diameter at the base and 18ft. at the spring of the cornice, which is 80ft. above the foundation. The height from surface of water to focal plane is 86ft. 3in. The base is 11ft. below surface of water. To a height of about 34ft. the tower is solid, with a centre well, and above it is divided into five stories or rooms, 14ft. in diameter. The masonry is bonded, dowelled where solid, and joggled in the annular parts.

The screw pile introduced by Mr. Alexander Mitchell has been of important service in lighthouse building, and has opened up a new era of construction. It may not be generally remembered that the first screw-pile lighthouse was built on the Maplin Sand, at the mouth of the Thames, in 1838. It is still in perfect preservation. Several interesting examples of screw pile lights have been erected for the United States; one at the mouth of Delaware Bay, and, much exposed, has stood since 1850. It has to withstand ice carried by violent currents, and is surrounded by an ice-breaker of screw piles having no connection with the lighthouse. The latter is conical, erected on pillars with outer balconies, and open to half its height. The sand shoals in the bays of the southern coast of the United States have furnished opportunities for this system of construction, and numerous structures have been erected, some of great magnitude. The Fowey Rock Lighthouse, lately completed on the northern extremity of Florida Reef, is shown in a plate accompanying the author's paper. Exposed to the fury of the Atlantic on the north-east, a wide base has been given to it. It is octagonal, the main super-structure being supported by eight vertical piles which rise a few feet above the water. The upper framing is drawn together at the top, and the angle piles are well braced. A gallery with davits for lifeboats is formed round the lower portion, upon the platform of which is the keeper's house filling up the centre portion; a cylindrical staircase leads to the lantern which has another balcony round it. A very similar construction is the Ship Shoal Lighthouse in the Gulf of Mexico, which guards the submerged sand-banks between the Mississippi and Galveston. The South-West Pass is another structure of the first order in which the iron skeleton tower has been adopted for a land site. In this instance the alluvial soil did not afford the support for a masonry structure, and wooden piles were driven over an area 60ft. in diameter in rows to a depth of 50ft. A reticulation of pile and grillage timbers was thus formed; the spaces were packed with concrete to a depth of 8ft., and on this surface were bolted iron socket discs from which spring the eight shafts of skeleton frame which form the octangular cone upon which the lantern is placed. Various other examples of lighthouses are illustrated by Mr. Barnard to which we may refer on another occasion; among these we note the important structure at Body's Island, built entirely of brickwork with a hollow, and 150ft. high, the Phare D'Armen and other structures of a similar kind.

THE HEATING OF SCHOOLS.

THE magistrates of Berlin a short time ago organised a scientific investigation of the arrangements for the heating and ventilation of the schools in that city. Of the 126 schools examined (in 118 buildings), 45 had local heating with Dutch tile and iron stoves, 54 air heating, 22 low-pressure water heating, three mean-pressure water-heating, one high-pressure water heating, and one air and water heating. The committee thought the following the chief points to be aimed at:—1. The temperature to be kept at a suitable height (19 deg. C. at the most), without the teacher having constantly to look after it. 2. The temperature of each schoolroom to be capable of regulation independently of all the others. 3. The temperature to show little difference in different parts of the class, horizontally and vertically. 4. The ventilation to be such that the air admitted be free of dust, noxious gases, and infectious matters, that it give no cause for complaint as regards moisture or temperature, and that it be renewed sufficiently to prevent impurities from breathing of the scholars reaching a limit dangerous to health. The committee, according to the *Times*, came to the conclusion that, as regards ventilation and regular distribution of heat in space, the method of central heating, and especially air-heating, is vastly superior to local heating, and that most of the complaints against it are groundless. The difficulties of regularly heating different rooms in one building are by no means insuperable. More intelligence is needed to conduct central heating than to manage a Dutch tile stove, and care must be taken to obtain practised stokers. The glowing of the heat apparatus (though not so dangerous as commonly supposed) is to be obviated by correct proportioning of the grate and heating surfaces, and an abundant moistening of the air in the heating chamber must be attended to. With central heating opening of the windows should be avoided. Except where the school is very favourably situated, the air should be filtered, and any dust, however introduced, removed daily from the desks and seats and the floor (which should be coated with oil colour or saturated with oil). The walls should be cleaned at least once a year. The central heating can be best effected, according to the report, by use of a water-heating arrangement in connection with a ventilation effected by pulsion, which sends to the classes an uninterrupted current of heated air, purified by filter, steam-jet, or water. A school to be thus heated is now being built in the Steinmetzstrasse, in Berlin.

THE FIRST ESSENTIAL IN ART.

THE first essential for the poet or the painter, says a writer in *The Magazine of Art* for July, is a thorough understanding of the original conception with which he has to deal, an understanding so complete that it shall differentiate the subjective beauty of it from the objective. Without this, if he sees at all, it will be with a confused vision, he will see only "men as trees walking." A cathedral church or a chimney-corner; a queen upon her throne or an outcast shivering upon a doorstep: a landscape with broad river and mighty trees, or a violet hiding from the sun; nothing is too great, nothing is too lowly to be the theme of Art, and to lead us into the Higher Life. But poets and painters fail in this—that they do not or cannot impregnate their minds with a living sense of the subjective beauty of that which is their theme. The subjective beauty of Strasbourg Cathedral is its magnificence; of Amiens, its symmetry; of St. Mark's Venice, its richness. Amiens Cathedral is so colossal that Westminster Abbey, the loftiest of our cathedral churches, would stand inside it and still leave room to build another church upon its roof—it is so exquisitely proportioned and of such delicate workmanship that every line is full of grace, and every stone a work of art; and upon all this has come the splendour that time alone can give. Yet artists go there, and after much patient search succeed in finding out some bit of upholstery with which in a corrupt age some ignorant chapter has desecrated it, and will paint the wretched morsel, thinking that they have painted a cathedral interior. St. Mark's is one of the wonders of the world, a church of which the pavement is of precious stones, the walls are hung with jewels, mosaics designed by the hands of Titian and the other giants. Yet the pictures we see of it are holes and corners, scraps and "bits," as artists call them, for the sake of colour, that are as much like St. Mark's as gilt gingerbread is like kings and queens, or as a yellow petal dropped upon a sanded floor is like a field of buttercups. Why are these things done in art? The historical painter, fired by the passion of some great action, gives us his record of it. Some, who are called "figure-men," cannot paint an historical group, but at least they aspire to paint a single figure. Others, who cannot even do that, are content to go on for ever painting "heads." But no one is content with "tails." It would be a poor soul who never rose above an eye, or a nose, or a finger as the subject of his picture. Yet that is what they do who, having no thorough understanding of the original conception, the subjective beauty, of a cathedral church, slink into the holes and corners of it and carry away only "bits" and scraps.

SHONE'S PNEUMATIC SEWERAGE SYSTEM.

ON Saturday week the Lancashire and Cheshire Association of Municipal and Sanitary Engineers and Surveyors held their sixth annual district meeting at Wrexham town hall, under the presidency of Mr. Edward Pritchard, C.E., of Warwick and Westminster. Mr. Isaac Shone, C.E., who is this year Mayor of Wrexham, explained his system for the pneumatic removal of sewage by means of his ejector. The advantages of a water-carriage dispoal of sewage were dwelt upon, and it was pointed out that a gravitating system of sewerage, although excellent in itself, could not be adopted in flat districts, for it was absolutely necessary that the sewage should flow through the sewers at a velocity of not less than 3ft. per second. This he believed he could effect on a level by employing the agency of compressed air. By diagrams and models he showed that the ejector consists of a hollow closed vessel, so placed as to allow the liquid to flow into it. An air-compressing steam-engine, turbine or water-wheel, is required to produce the necessary air pressure, and this engine could be employed to work any number of ejectors at any distances from the engine. Inside the ejector are two small cylinders, each open at one end and closed at the other, and termed the "bell" and the "cup"; the latter is always filled with sewage. The cup and bell are connected by a rod, and a small rod passes from the upper one—the bell—through a stuffing box in the cover to a lever, which actuates a small slide valve, governing the action of the automatic piston valve so as to alternately admit compressed air to the ejector and let it escape. When the ejector is nearly full the liquid, as it rises, encounters the bell, thereby drawing back a small slide-valve; this admits air-pressure to one end of the automatic piston-valve, the outer ends of which act as the motive piston, the middle portion acting as the valve, regulating the inlet and exit of the compressed air. The compressed air thus entering forces the sewage out through the delivery pipe, a ball or other valve being placed both at the inlet and outlet to prevent the back-flow of liquid. The cup and bell arrangement being balanced, and the weight of the liquid in the cup being neutral so long as it is submerged, retains its position until the vessel is nearly empty and the liquid begins to pass below the cup. The deadweight of the liquid in the cup, then acting downwards, pulls the cup and bell down, reversing the small slide-valve, and so shooting the piston valve over to the opposite side, shuts off the compressed air, and opens the ejector to the exhaust. The compressed air at once rushes out, allowing a freer charge of the liquid to enter by gravitation, and the action is repeated. Mr. Shone claimed for his apparatus the merits of being simple and certain, worked by a small amount of power, and capable of dealing with large quantities of sewage. The meeting was then adjourned, and the members visited the sewage farm at Hafodywern, over which they were conducted by Lieut.-Col. Jones, V.C., who explained and exhibited his system of sewage drying and manure manufacture, and the pneumatic ejector already described. On returning to the town hall opinions of a recommendatory character were expressed as to Mr. Shone's invention by various members of the association. The chairman, in closing the discussion, said the question of cost had not been mentioned by Mr. Shone. This would vary with circumstances, and would be very much a competition between this and water power and steam power as a motor, and he thought the ejector must eventually compete with them on good terms because of three points in its favour—the removal of sewage without the necessity of any particular description of valve or piston, the absence of momentum, and the infinitesimal nature of the loss by escape. Another feature was, that sewers could be ventilated by it by a current of pure air under pressure. Some discussion then took place as to the plans adopted at the sewage-farm, as to which Col. Jones made some further explanations. Two or three of the visitors said they did not believe in the artificial means there adopted of drying sludge, but the arrangements were generally approved of. The proceedings, which lasted from 10 till 4, were closed with votes of thanks to the Mayor of Wrexham and Colonel Jones.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Midland Institute.—On Saturday last the members of the Archæological Section of the Birmingham Midland Institute had a "walking excursion" from Birmingham to Dunchurch, Bilton, and Rugby. Leaving New-street Station at noon, the party proceeded *viâ* Coventry to Leamington, and thence to the Dunchurch Station on the Rugby line, and then had a fine walk along the famous avenue of Scotch firs for a mile and a half to Dunchurch, where dinner had been provided. After dinner the statue of Lord John Scott and the village stocks having been inspected, the visitors proceeded to the church, where the rector was in attendance, and gave every facility for examining the restored, but very interesting building. The architectural details and growth of the church were explained by Mr. Cossins and Mr. Everitt, and considerable interest was shown in a marble monument with the folding doors, possibly only to cover the inscription, but probably considered as appropriate, being in book form, to the "King's Printer" of two centuries ago. A pleasant walk ensued through the cornfields to Bilton Hall, where Joseph Addison spent his later years, after his marriage with the Countess of Warwick, and where his only daughter lived till 1794, and died at a very great age. The hall is picturesque in form, partly of the time of James I. and partly of Queen Anne, while some more modern changes have been made. The house generally and the gardens, however, remain pretty much as "Mr. Spectator" left them, and his favourite summer seat and walk may still be seen. The church at Bilton offered little to attract; and the visitors strolled on to Rugby, where Mr. M. H. Bloxam, F.S.A., had invited the members to accept his hospitality. Mr. Bloxam received his guests with his usual courtesy, and nearly two hours were spent in looking over the treasures crowded in every corner of every room. In the hall there was a head from the Sandwich Islands, before which human lives had often been sacrificed, one of the hard-wood stilettoes which were used at the murder of Captain Cook, some assegais from Caffraria, some old plate and chain armour, and a score of other rare and curious relics. The dining-room had some fine crayon sketches by Sir Thomas Lawrence, bookcases crowded with rare books, arms, and relics of all dates and countries, while an adjoining room had a table covered with stone and bronze celts, arrow heads, some balls from Naseby and Edge Hill, fine old MSS. of the thirteenth and fourteenth centuries, two of the early folios of Shakespeare, a valuable MS. of Sir John Mandeville's travels, and an unrivalled collection of weapons, tools, &c., found in Warwickshire from time to time. A stroll to the station for the 8.15 train concluded a most charming day.

PARLIAMENTARY NOTES.

London Bridge.—In the House of Lords on Thursday week, the motion for reading the London Bridge Bill a third time was opposed by Lord Carnarvon, on the ground that the proposal to widen the bridge would destroy the architectural beauty of the structure, and that the proper method of providing for the increased traffic was to build another bridge lower down the river. The Lord Chancellor reminded their Lordships that the Bill had passed through the Commons without opposition, and argued that now it had reached its final stage it was too late to examine into the facts which justified its introduction. Some discussion followed, but eventually the suggestion of Lord Granville was adopted that the Bill should be referred to a Select Committee for further inquiry.

CHIPS.

A new pavilion is about to be erected for the Preston Cricket Club, from the designs of Messrs. Garlick, Park, and Sykes, of that town. It will be of framed timber and brickwork, and provides for a dining-room, 30ft. by 16ft.; two dressing-rooms, each 15ft. by 12ft., with lavatories; bar, 15ft. by 5ft.; and kitchen, 12ft. by 9ft. Along the front of centre portion will be a verandah 5ft. wide; the roof will be surmounted by a bell-cote; the timber-work throughout will be stained and varnished, and the windows will be glazed with lead quarries. The contract has been let to Mr. Thomas Riley, of Fleetwood, for £500.

A central coffee tavern establishment was inaugurated in Capel-street, Dublin, on Thursday evening. The house was originally built for pottery manufacturers, and has been transformed for its new purposes in accordance with the designs of Mr. Albert E. Murray, architect. Mr. James Pile, of Dublin, was the contractor.

A new Congregational chapel was opened at Bridlington last week. It occupies the site of, and is partially reconstructed with the materials of, the Empress rink, seats 750 persons, and cost £4,500.

The eleventh annual convention of the American Society of Civil Engineers has been held at Cleveland, Ohio, beginning Tuesday, June 17.

The Essex and Colchester Hospital at Colchester is in course of enlargement at a cost of £6,500, from the designs of Mr. T. H. Wyatt, of London. On Thursday in last week the foundation-stone laid in June, 1819, was removed with some ceremony to the front of the new board-room, and, strange to relate, all the gold, silver, and copper coins enclosed in a bottle and those separately sunk in the stone sixty years ago, were found intact.

At a vestry meeting held at Oswestry on Thursday, the 26th ult., an estimate from Messrs. Taylor and Co., of Loughborough, offering to rehang and perform other work to the bells in the parish church tower for £205, was accepted.

A statue of Sir John Gray was unveiled in Dublin on Tuesday week. One of the chief services that M.P., engineer, and journalist rendered the city of Dublin was to secure for the citizens a water supply from the mountain river known as the Vartry.

It is proposed to erect a new convent and schools at Lixnaw, county Kerry, Ireland, for the Most Rev. Dr. McCarthy, Bishop of Kerry. Mr. Dominic J. Coakley, architect, has been instructed to prepare plans for the above.

Mr. E. J. Maumené finds, according to *Les Mondes*, that the absorptive power varies in different woods, when dried in a vacuum, between 9·37 per cent. and 171·86 per cent. The maximum, 174·86 per cent., or 7-4ths of its own weight, is found in chestnut timber. The moisture contained in wood in its ordinary state varies between 4·61 per cent. and 13·56 per cent. The absorptive power varies but little in different samples of the same wood.

Building Intelligence.

Carlisle.—The new banking premises in this city for the Clydesdale Banking Company are now completed. The building is designed in the Early Gothic style, and comprises the bank and its accessories on the ground-floor, and suites of offices above. The builders are Messrs. C. and J. Armstrong, Carlisle, and the architects Messrs. Hetherington and Oliver, of the same city.

Chester.—The new schools for the parishes of Saint Michael's and Saint Olave were opened on Wednesday, the 25th of June, the Lord Bishop of the Diocese being in the chair. The building, which consists of boys' and girls' schools and class-rooms, with porches, offices, &c., provides accommodation for 240 children. The whole of the works have been carried out under the direction of Mr. Harold Hignett, architect, of Chester, Mr. Hughes, of Aldford, being the contractor.

Friskney.—The parish church of Friskney, Lincolnshire, was reopened on the 19th June after restoration, from the designs of Mr. Butterfield, of London. The north and south aisles have been entirely rebuilt, and also the south porch, the columns of the south arcade underpinned and their bases restored, the clerestory and tower windows repaired, the north window of tower reopened, the magnificent tower arch cleared of old woodwork, and its floor brought to original level. New floors have been laid in the nave and aisles with passages of Minton's tiles and Porritt's stoves have been introduced for heating. Hartley's tinted cathedral glass with white borders is used in the tower, south aisle, and clerestory windows, in which the traceries are new. Oak and walnut screens are erected at the doorways, and the new doors are of oak, the iron work being all hammered. The seats for the aisles are of red deal, stained in two colours. The chancel has been newly floored and paved within the rails with Minton's encaustic tiles, and furnished with choir seats, altar rails and table of oak and walnut. The reredos hanging has been designed by the architect, and was worked by Mrs. Giles, of Alington, and Mrs. C. Booth; Mrs. H. Booth worked the altar cloth and frontal. The work has been carried out at a cost of £3,500 by the contractors Messrs. Walter and Hensman; Mr. Nash was clerk of works.

Glasgow.—With reference to the notice of the "New Theatre, Glasgow," which appeared in our issue of the 31st May, we are requested to state that besides the theatre large shops and warehouses are in course of erection for the Central Halls Company (Limited), from the designs of Mr. James Thomson, I.A., St. Vincent-street, Glasgow, the whole of the works being executed under his superintendence. About one-third of the whole building was at first reserved for a large hall, committee rooms, &c. The space reserved for the theatre (about one-third) was at first designed to contain large halls and committee rooms, &c., but when the directors of the company resolved to have a theatre, Mr. Frank Matcham having had large experience in designing and constructing theatres, was engaged to prepare designs and to be consulting architect for this portion of the building.

Liverpool.—The foundation-stone of a new Baptist chapel was laid on Tuesday in Princes-road, Liverpool. The design is of Italian Renaissance character, and will be executed in picked grey brick and Runcorn stone. The sides and each end will be carried out in similar materials to the front, but plainer in detail. Two vestibules and doors lead from vestibule to chapel, which will be 75ft. long by 52ft. wide and 35ft. high in centre. The ceiling will be panelled in plaster and slightly curved in centre and splayed to walls over galleries, but in one span. At the east end is the raised platform, occupying a space 31ft. wide by 25ft. deep, having an apsidal end and semi-domed roof. The seats, of pitch-pine, will be all slightly radiating on the ground floor, and will accommodate 600 persons. In front of the platform on level of chapel floor will be placed the baptistry. At each end are the ministers' deacons' and ladies' vestries, having access from the chapel and from the outside by separate entrances. The gallery will occupy the two sides and west end and will seat 350 persons, making the total number of sittings 950. The basement comprises a large lecture-room 75ft. by 52ft. and 15ft. high, with platform at east end and space for library and two class-rooms at west end. The cost, including boundary walls, gates, railings, &c., but exclusive of land, will be about £9,000. The contractors for the work are Messrs. Brown and Backhouse, builders, Chatham-street, Liverpool, under the superintendence of Mr. Henry Sumners, F.R.I.B.A.

London School Board.—At this board on Wednesday, the following tenders were accepted:—For erecting new school for 600 children in Warple-way, Wandsworth, Mr. W. Downs, of Hampton-street, Newington, amended to £4,775; for school for 600 children at North-end, Fulham, Mr. W. Tongue, of Plumstead, £5,006; for school for 1,200 children in Wenlock-road, New North-road, Messrs. Kirk and Randall, £9,424; for a school for 1,000 children in Thornhill-road, Messrs. Aitchison and Walker, of St. John's Wood, £8,271; for the enlargement of Glengall-road School, Cubitt-town, by 200 places, Messrs. Sheffield and Prebble, of Poplar, £1,989; for enlargement of the Hargrave Park-road School by 467, Mr. T. Boyce, of Hackney, £3,965; for schoolkeeper's house and cookery classroom at Hunter-street School, Walworth, Mr. J. Tyerman, of Walworth, £612; for schoolkeeper's house at a site at Dalgleish-street, Messrs. Atherton and Latta, of Poplar, £350; for desk back-irons, Mr. W. B. Creighton, 8d. and 10d. each. The works committee reported that they obtained fresh tenders from eighty-four firms for various articles of furniture, and recommended the acceptance of the following tenders:—Mr. J. J. Bastien, Howard's-buildings, Central-street, Old-street, E.C., table for managers' room, 6ft. by 3ft. 6in., £3 10s.; table for teachers' room, 4ft. 6in. by 3ft., £2 10s.; table for teachers' room, 3ft. 6in., by 2ft. 6in., £2; cutting-out table, 6ft. by 2ft. 6in., £3. Mr. E. H. Sargeant, 2, Albion-place, St. John's-lane, E.C., Kinder-garten table, No. 1 size, 18s. 6d.; No. 2 size, 11s. 6d.; portable lavatory, £2 5s.; cupboard for teachers' room, 2ft. 9in. by 2ft. 11in., £2 2s. These prices are in the case of each article, with one exception, less than those hitherto paid by the board.

Scorton.—The new memorial church of St. Peter, Scorton, was consecrated by the Bishop of Manchester on Saturday. The church and site are the gift of Mr. James Ormrod, of Bolton, in memory of the late Mr. Peter Ormrod, of Wyresdale Park, and it is estimated to have cost from £13,000 to £15,000. The building consists of a nave of three bays 52ft. long and 20ft. wide; a chancel of similar width under the same roof, but divided by a chancel arch; a north aisle to nave 13ft. wide, opening at the east end, with an organ transept 14ft. by 13ft., beyond which is a vestry 15ft. by 13ft. At the west end of church is a tower 50ft. high to cornice, surmounted by a timber spire covered with oak shingles, the total height being 124ft. In the tower is a peal of eight bells, and a clock with two external dials. The outside walls are of hammer-dressed broken-coursed masonry, the internal walls being faced throughout with chiselled ashlar. The roofs are open-timbered, of pitch pine, covered with red Staffordshire tiles. The chancel fittings are entirely of oak, the reredos being elaborately carved and decorated. The chancel floor is laid with ornamental tiles. At the entrance to the churchyard on the north side is a lychgate of oak covered with tiles. The east window has been filled with stained glass by Messrs. Burlison and Grylls, of London. The contractors were—Mason's work, Messrs. Wilkinson and Kirby, Longridge; carpenters' and joiners, Mr. Blades, of Lancaster; plumbers', Messrs. Walmsley and Co., of Preston; tilers, Messrs. Cross and Sons, of Lancaster; heating, Mr. Charles Seward, of Preston; gasfitting, Messrs. Hart, Son and Peard, of London; and bells in tower, Messrs. Warner and Sons, of London. Messrs. Paley and Austin, of Lancaster, were the architects, and Mr. J. Mills acted as clerk of works.

Stafford.—The County Lunatic Asylum at Stafford has been extended by the erection of sanitary wards, at a cost of nearly £10,000. The new wards were designed by Mr. R. Griffiths, the county surveyor. They are situated about 200 yards to the south-east of the main block of buildings, and as in the case of the latter have a south-western aspect. Accommodation is provided for eighty-two working patients, or, in case of an outbreak of infectious disease, thirty-nine patients. The central block contains kitchen, larders, stores and nurses' room on ground-floor, with ward, single rooms, attendants' rooms, &c., on first floor, while on each side of the central block are stone staircases, one for males and the other for females, leading to the upper wards. The principal wards, 55ft long by 20ft. wide, are placed to the right and left of the central block on the ground and first-floors, with a day-room underneath the wards nearest to the asylum. Each ward has a bath-room, scullery, closet, &c., connected with it, but built out from the ward to insure proper ventilation and security from sewer gas. The wards have been built to correspond somewhat in style with the asylum buildings. The floors are laid with pitch-pine, and the walls for a considerable height above the floors are executed in polished parian cement. The works have been completed by Mr. William Pemberton, contractor, Stafford, Mr. William Nevett acting as clerk of the works.

The Bull Point Lighthouse.—Late on Monday night the new lighthouse which has been erected at Bull Point, Morthoe, North Devon, was lighted for the first time. The money expended upon the building by the Trinity Board exceeds £7,000, in addition to the light-lantern and fog-signal. The contract was placed in the hands of Mr. R. T. Hookway, builder and contractor, of Bideford, and he has completed the work greatly to the satisfaction of the Trinity Board, and some time before the time specified in the contract. The building consists of a block containing dwellings for three keepers and their families, a fog signal-horn, tower, &c.; also an oil store, general store, piggeries, and office. The tower of the Bull Point lighthouse is 30ft. high, and the top of the lantern is about 20ft. above the tower. Mr. George Francis acted as clerk of the works for the building.

CHIPS.

The foundation-stone of a new south aisle and porch, at St. Paul's Church, Colchester, an edifice erected in 1869, was laid on Thursday in last week.

The memorial to the late Cardinal Cullen, it has been decided, shall take the form of a statue in bronze, to be erected at the junction of Tyrone-place and Marlborough-street, near the Pro-Cathedral, Dublin. The work is to intrusted to Mr. Thomas Farrell, R.H.A., and is not to exceed in cost £2,000, for statue and pedestal.

A numerously attended meeting of rate-payers was held at Horncastle, on Tuesday week, to discuss the question whether the new water-works shall be carried out by the local board, or by a private company, and it was finally resolved to put the undertaking in the hands of a company.

A new Wesleyan chapel at Morley was opened last week. Mr. G. Mallinson, of Dewsbury, is the architect. The style is Venetian Gothic. The total cost of the building is £1,949 9s. 8d. There is accommodation for 500 persons.

Last week five memorial stones were laid of a new Wesleyan chapel which is being erected at Upper Haugh, about three miles from Rotheram. The new building was commenced on the 12th May last, from plans prepared by Mr. J. Platts, architect, Rawmarsh. It is to consist of a schoolroom, with chapel and vestries above. The building will be in the Italian style of architecture, and will be constructed of Haugh stone, with Kilnhurst stone dressings. Accommodation will be provided for about 350 worshippers and 250 scholars, and the total cost will be about £1,500.

At a meeting of the general committee of the Liverpool Masonic Hall last week, it was unanimously resolved to proceed with the decorations of the various rooms in the building along with the staircases. The entire cost of the work is estimated at about £2,000, and the plans submitted by Bro. F. Smith, decorative artist, of London and Chester, were adopted.

A statement recently went the round of the papers that the Princess Louise had occupied her leisure in the construction of a mantlepiece inlaid with different Canadian woods. We are informed, on the best authority, that the report is incorrect, although it is possible that at a future time Her Royal Highness may make such a mantlepiece as was described.

The fifth annual meeting of the Sanitary Association of Scotland was held in the town-hall, Dundee, on Monday. Mr. William Mackison, borough surveyor, Dundee, the president, occupied the chair.

The extension of the Metropolitan District Railway from Turnham-green to Ealing was opened for traffic on Tuesday.

More than Fifty Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period. The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation render its the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.C.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line of eigh words (the first line counting as two). No advertisement inserted for less than half-a-crown. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

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Cases for binding the half-yearly volumes, 2s. each.

A Student. (Each of the methods you show has its merit. The side marked A is better for wide spans or where a heavy roof is necessary. For sheds and lighter buildings we prefer B. The reason why A is strongest is that the principal is supported at two points, while in the latter it is only supported in one. The latter is, however, sufficient and more economical for 32ft. span.)—J. S. C. (The advertisement has been in all the daily papers, and we do not intend to give it further publicity by referring to it. After all, what can you expect from such a significant name?)—Spero Meliora. (A week's notice in the absence of any agreement.)—W. H. (Yes; post-free, 2s. 3d.)—Perplexed One. (In long pipes the "head of water" is measured from the surface of water in reservoir to the discharge end of pipe when it flows full.)—James Walls. (Consult Gwilt's "Encyclopædia." One of the best recent treatises on Perspective is that appended to Newland's "Carpenters and Joiners' Assistant." Nicholson's "Practical Perspective" is also a good, though old, treatise).

G. N.—H. D. G.—W. K. L.—G. B. and L.—J. G. H.—N. W. R.—H. Bros.—W. O. C.—G. S.—Rev. S. A.—R. and E.—T. F.—F. W. and Co.—McN. R. and Co.—J. D.—D. U.—E. S. and Co.—S. Bros.—R. J. E.—J. W. and Co.—F. J. and Co.—B. H.—D. O'B.—H. W.—P. and Son.—W. R.—J. J.—W. G.—J. W. A.—G. and Co.—J. E.—W. J. S.

"BUILDING NEWS" DESIGNING CLUB.

List of Subjects.—1. A cottage villa to contain, on the ground-floor, entrance hall and staircase, general sitting-room, about 250ft. super., a small room, 120ft. super, suitable for a study or parlour, kitchen, scullery, pantry, and stores, and on the upper floor 4 bedrooms and w.c., the room over living-room to be used as a drawing-room if necessary, and 2 or 3 good attics. Plans and elevations, 1-6th of an inch to a foot. 2. A cabinet chiffonier, the upper part being glazed for the exhibition of old china, about 7ft. high and 4ft. wide. Plan, view, and details. Inch scale and ¼ full size details.

Drawings Received.—Meute Monarque, Steffano, Ogmore, Curiose, S in Circle, Motto J., Excel, East Anglian, Peter, Elève, Semper Paratus, Tempus Fugit.

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Correspondence.

NEW WESLEYAN COLLEGE, BIRMINGHAM.

To the Editor of the Building News.

Sir,—Mr. Waterhouse has not thought proper to explain the apparent anomaly in his report on these designs, which was pointed out in the Building News of the 20th ult.

The committee, of course, have asked for more than they can get for their money, as committees always do. However, what they say practically amounts to this—Give us the best building you can for £23,000.

Mr. Waterhouse tells us he has based his decision on the conditions, with special reference to cost; but when we look at the design placed first we find that element altogether ignored. And when we ask for that which does not seem unreasonable—an explanation, we are met with chilling silence.—I am, &c., Candeur.

Sir,—In your last week's issue there appeared a letter respecting above, in which it was stated that one of the competitors had been informed, before the drawings were sent in, that "the committee had decided not to accept any design founded on the quadrangular plan." To test the truth of this we wrote to the committee. The reply we append hereto.—We are, &c.

Competitors.

[Copy of letter referred to.]

"19, Yew Tree-road, Birmingham.
"June 30th, 1879.

"My dear Sirs,—I have not seen the Building News of last week; but in reply to your question beg to say, that as far as I know, this form of building (quadrangular or otherwise) was not even mentioned in this committee prior to the adjudication, and certainly no decision of the sort you name was come to. The statement in the Building News is therefore without foundation.—Yours truly, "(Signed) J. E. Clapham."

THE STONE AT LEWANICK.

Sir,—I thank Mr. Hems for his further information about this object, and write in return to enlighten him about cresset stones. A cresset stone is a stone in which are sunk one or more cups. They vary in known examples from one to sixteen. These cups were filled with tallow and a wick inserted in each, and they were used to give light at night in churches and other places where light was wanted. This at Lewanick seems to be intended to light people entering by the north door, and would be used chiefly on winter mornings. Is Lewanick Church one of those in which the principal entrance is on the north? Those who want to know more about cresset stones had better consult the "Rites of Durham Abbey" (Surtees. Soc. Edel., pp. 19 and 73) where they are described by a writer of the sixteenth century who had seen them in use. An example with one cup is figured in a paper by me on Westminster Abbey in the *Archæological Journal* for 1876, and several good ones with many cups in a paper by the Rev. T. Lees, in the "Transactions" of the Cumberland and Westmoreland Antiquarian Society for 1878.—I am, &c., J. T. Micklethwaite.

THE RAMSGATE MARINE DRIVE.

Sir,—As you have devoted considerable space to the consideration of this proposed improvement, may I ask you kindly to insert the following letter which was read before the Ramsgate Local Board this day? A perusal of the inclosed pamphlets will show to whom the inception of the proposed marine drive is due. I am told, however, by a well informed gentleman, a late chairman of the local board, that although one of the schemes that I have from time to time put forward must necessarily be adopted, the fact will not be recognised. The axiom—a prophet shall receive no honour in his own country, is but too often realised.—I am, &c.,

W. Vincent Green.

St. Lawrence-on-Sea,
July 1st, 1879.

"To the Chairman and Members of the Local Board.

"Gentlemen,—It must be obvious to all that the premiated drawings, and nearly all the others submitted in competition, follow the lines shown on the *design* for the marine drive modelled twelve years ago. None of these drawings, however, show gradients so easy as those I have worked out. Seeing, then, that *no improvements* have been suggested, will it be consistent to adopt gradients of 1 in 17 or 1 in 20 when 1 in 30·3 on the east and 1 in 37 on the west may be obtained without bridging over Harbour-street, and at less cost? If the board doubt the correctness of the levels shown in my models and plans, let your surveyor test them, and, if correct, the ratepayers of the town are entitled to ask that they be adopted in preference to the breakneck inclines shown on the premiated and other favoured drawings.

"In order to comply with the 'instructions' and interfere as little as possible with the Military-road, my working drawings show portions of the pavements of Sion-hill and of the New-road opposite thereto, supported by cantilevers. If, however, the Board of Trade will permit—as no doubt they will—the placing of a few iron columns where the stone posts now stand at the edge of the Military-road, such cantilevers may be dispensed with, and *no property beyond York-place need be taken.* May I then suggest the expediency of applying to the Board of Trade on this point before coming to any decision on the New Road question?

"I would state that the construction of a low-level road, such as is suggested and shown on the model, requires no great engineering skill; the question therefore to be decided upon is simply this: What road will best meet the requirements and means of the town? That question you are best able to decide.

"I would also call attention to the fact that in addition to supplying far easier gradients than any other competitor, my designs show improved approaches to Albion-place and Wellington-crescent; also a new carriage approach to the pier, the sands, and the Marine, Rose-hill, Sion-hill, and Prospect-place are not disturbed.—I am, &c.

W. Vincent Green.

"St. Lawrence-on-Sea,
"June 30th, 1879."

PORTLAND CEMENT

Sir,—In your "Intercommunication" column, January 31st, 1879, the following question is asked (5667):—"Can any of your readers furnish information as to the first inventors of Portland cement?" In the number for the following week "G. H. G." replies (5667), and confers the honour of its *introduction* on Smeaton. This statement is no doubt correct as regards its practicable application, but it *does not* answer the question put by "Creta"; and as it has a tendency to misguide, and to take "honour from whom it is due," I take the liberty of stating that for the *invention* of Portland cement we are indebted to Joseph Aspdin, a bricklayer of Leeds, who took out a patent for artificial stone on the 21st of October, 1824, and describes it thus:—"My method of making a cement, or artificial stone, for stuccoing buildings, waterworks, cisterns, or other purpose to which it is applicable (and which I call Portland cement) is as follows."

He goes on to describe its manufacture, &c., which, with the exception of his having calcined the limestone, is practically the same as that carried out on the banks of the Thames and Medway at the present day.—I am, &c.,

R. H. Hammersley-Heenan,
District Engineer Cape Government Railways.

CHIPS.

The annual excursion of the Suffolk Institute of Archæology will take place a fortnight hence, on Friday, the 18th inst. The members will visit, from Haughley Junction, Aspall Hall, Crowe's Hall, and the ancient town of Debenham. At the latter place a paper will be read in the large and interesting church by the rector, the Rev. C. J. Cornish.

The Avon bridge at Stratford-sub-Castle, near Salisbury, is being enlarged from the designs of Mr. Henry Weaver, county surveyor of Wilts.

The Brighton Town Council have received a number of tenders for stoneware drain pipes, and have accepted that of Messrs. H. Doulton and Co., of Lambeth, to supply 6,000ft. of 6in., at 3¾d. per foot lineal, and 3,000ft. 9in. at 6¼d. per foot lineal.

At Friday's meeting of the Metropolitan Board of Works, a deputation representing the Holborn District Board and the Vestries of Clerkenwell and Islington, appeared, and were heard in support of a memorial in favour of a new thoroughfare, from the Gray's-inn-road to the Angel, at Islington. The subject was referred to the works committee for consideration and report. A notice was received from the Thames Conservators of the appointment of Captain Douglas Galton, C.B., as arbitrator, and also a request to the board to appoint the other arbitrator in connection with the difference which has arisen between the conservators and the board with regard to keeping the River Thames free from banks or obstructions to the navigation thereof. This was referred to the same committee.

Intercommunication.

QUESTIONS.

[5813.]—**Rain-Water from Nave Roof.**—Can any of your correspondents suggest a satisfactory method of conveying the rain-water from the roof of the nave of a church? In some cases it is brought down the clerestory by a pipe with a shoe at bottom to shoot the water unconfined over the aisle roof, and the wind catching it blows it under the slates or tiles, causing unsightly leaks. In other cases the pipe is continued over the slates or tiles of aisle roof to the eaves-gutter of aisle. This has a very unsatisfactory appearance, and is inartistic from its incongruity. An ordinary lead gutter would shoot down the water too rapidly, but it suggests itself to me that if a lead gutter were formed down the slope of aisle roof to the aisle eaves, with raised roll on each side and the sole of the gutter formed in shallow steps, the result would be a sound job of satisfactory appearance; the water would be checked in its rush at every step. Would intercommunicants favour me with their opinion?—R.

[5814.]—**Poor Law Board Buildings.**—Are there any instructions issued by the Poor Law Board giving requirements of workhouse buildings and infirmaries in connection therewith, similar to those issued by the Education Department on school buildings, and if so, who are the publishers?—Enquirer.

[5815.]—**"Apple and Pear" Window.**—In Heath Grammar School recently pulled down was a circular window, which always attracted attention. I have just had laid before me the Building News of 1869, and in the first number of that year there is a view of Newhall, about 3 miles from the school, which contains a similar window. There is this peculiarity in both, that they were no part of the original design, but insertions. The hall and the school were erected about the same time. From the peculiar effect produced by the glazing, the popular name of our window was "the apple-and-pear window." Can any of your readers say whether the design is an original one, and if not, whether there is any older one, and where?—Thomas Cox, M.A.

[5816.]—**Internal Painting.**—I have just erected a row of houses, and am now about to paint the internal woodwork, and I am desirous of ascertaining the most suitable and agreeable colour to finish with. The houses, I may also add, are for the middle class. Will one of your numerous readers kindly inform—Calor.

[5817.]—**Dilapidations and Notice to Repair.**—Where a yard with w.c.'s at the back of four houses is for the common use of the tenants, who is liable for dilapidations, a clause in a 21 years' lease of one of the houses giving the right of use simply to the lessee? The repairing covenant runs—"to keep the said messuage and shop repaired, glazed, &c., &c." Not a word as to the yard. The other tenants hold under yearly tenancies, having in their agreements similar clauses as to use. Should a "Notice to Repair" be signed by the *lessor?* What steps should be taken if, after the three months' notice has elapsed, nothing has been done by the lessee?—L. T. W.

[5818.]—**Old China.**—Can any reader give me a receipt for the best mastic for mending old china? I have tried various cements more or less unsuccessfully. Rivets are a trifle clumsy, and spoil the work of delicately-moulded cups. Information upon this point may be useful perhaps to others besides—An Old Crock.

[5819.]—**Distemper Painting.**—Will some one acquainted with the subject kindly inform me—(1) What are the ingredients of distemper paint, with the manner of mixing and laying it on? (2) What are the most useful and permanent colours, with the proportion or proportions of them required for the different shades and tints? (3) Could he suggest some agreeable and harmonious combinations of colours for rooms with skirting, dado, wallspace, cornice, and ceiling? (4) What is the best material for stencil plates? I think I have seen oiled paper used. An answer to all or any of these questions will much oblige—John J. Cresswell.

[5820.]—**Extras.**—Will any of your professional correspondents give their opinion in the following case, viz.:—Drawings of a shop with balcony are submitted to a builder to tender for the work, the height of the said building being figured thereon 18in. lower than the scale measure. His tender is accepted; but after commencement of the work the local authorities refuse to allow the balcony to be erected unless made 18in. higher than shown. The architect therefore instructs the builder to raise it accordingly, and to make the whole front the 18in. higher than his own figured dimension, but refuses to certify for it as an extra, stating that it is only according to the scale drawing. Would not the builder be able to enforce payment for the extra work under the circumstances?—Common Sense.

[5821.]—**Sewer.**—Would some of your readers who have had experience in sewerage works give replies to the following:—How should a sewer, say 3' 6" diameter, be timbered, average depth 20ft., all to be open cut—1st. Where the ground is of stiff clay or gravel; 2nd. Where the ground is loose and apt to shell out and has water? 3rd. What appliances would they use in the event of there being a large quantity of water? 4th. Could they recommend any practical works dealing with this subject?—Juvenis.

[5822.]—**Freestone.**—What is "freestone"? The northern granite people call the fine-grained sandstones "freestone"; the southern call the oolitic stones "freestones." This is very misleading. Why cannot we have one term by which we can distinctly understand what is really meant by the term, or distinctive names by which each variety might be described and understood? Perhaps some of your numerous readers may be able to favour me with a solution of my difficulty.—J. W.

REPLIES.

[5773.]—**Lime.**—In reply to J. S. Goldthorp, it will be best to review the points at issue and to quote that which is necessary in order to prove that what J. S. Goldthorp writes is erroneous. On May 23rd, "An Ignorant Man" asks for information on lime. On May 30th I reply and state nothing which has since been proved to be erroneous. On June 6th J. S. Goldthorp (who, by the bye, did not, I presume, come to the aid of the "Ignorant Man") appears in print to attempt to correct me of error for having stated that "poor limes contain no alumina but insoluble silica," and J. S. G. then goes on to state that "poor" or "meagre" lime is the term generally used for hydraulic lime. On June 20th I proved, by quoting from Mr. G. R. Burnell's work on limes, &c., and by quoting from General Treussart writings translated—1st. That "poor limes contain no alumina but insoluble silica," which I had stated, and which J. S. G. had, although uncalled for, chosen to contradict. Secondly. I likewise proved J. S. G.'s statement—viz., that "poor" or "meagre" lime is the term generally used for hydraulic lime—to be incorrect, and to be an error or muddling up of two quite different things which was exploded by General Treussart, and who was one of Mr. Burnell's 38 authorities, whom he states he consulted, and I appended my anticipation that in the face of the unanswerable proofs I had given that J. S. G. might not impossibly show evidence of a wish to still appear to be right. He appears rather to have smarted under my remark, and which he says he thanks me for, but at the same time instead of candidly admitting that I had proved him wrong (and he may remember that he took the initiative in first contradicting me when I was right) he is now silent as to the subject of original disputation he initiated, but he brings for the first time rich limes into the question, and wants to know how it is that the terms "poor lime" and "rich lime" are used under the Science and Art Department? I should like to ask him what rich lime has to do with the question he first erroneously contradicted me on? His last letter would cause any one to suppose that I must have denied the term poor lime or else rich lime, or both; but I have not done so, and therefore such statements would tend to throw a false complexion on the subject under dispute. I believe in three distinct kinds of lime, and so stated in my first paper, such being poor lime, hydraulic lime, and rich lime. J.S.G. sought to reduce the three to two by confusing poor lime and hydraulic lime as one and the same, and I have proved that they are not the same, and now J. S. G. seeks, if I understand him rightly, to prove that they are the same because the remaining third term and one of the two in dispute are used in the Science and Art Department, and that therefore the other one of the two in dispute must be included in the former, and that therefore there are but two, and that as a consequence poor limes are hydraulic limes, but I have already proved to the contrary, and therefore what is the use of going on in such absurdity? It would be much better to retreat to common sense at once than waste time with such nonsense. If J. S. G. studies a little more I apprehend that he will find the Science and Art Department allows that there are as many kinds of lime as stated by me at the first, and neither more nor less, and moreover J. S. G. says that I seem to think he did not quote from good authority. I must beg to inform him that, seeing that all the recent authorities prove him to be wrong, as they do not vary on this one question that I am aware of, it appears doubtful whether J. S. G. quoted on any authority but his own; and, indeed, he has quoted nothing yet, but come down with flat assertion, devoid of proof or substantiation, and I think the identical word "seem" is inapplicable. And to conclude, I will ask J. S. G. whether he means to imply that the Science and Art Department teaches that there are but two kinds of lime while there are three; or if they teach that there are three, then how does that support his assertion that there are but two? And, again, if he will still continue to state that they teach there are but two, then where is their text-book on limes, and who is its author, and whence his authority, also who is the publisher?—Henry Ambrose.

[5773.]—**Lime.**—J. S. Goldthorp will find the difference between *rich*, *poor*, and *hydraulic* limes carefully explained on pages 252-3 of "Notes on Building Construction: Part 3, Materials," published by Rivingtons, and specially arranged to meet the requirements of the South Kensington examinations.—C. W.

[5773.]—**Lime.**—I do not think "An Ignorant Man" could find better definitions of the terms "fat" and "quick" lime than those given by General Gillmore in his "Treatise on Limes, &c." (1872), in which he will find, in addition, much useful information on the subject. Meagre limes containing sufficient silica can frequently be converted into hydraulic limes by simply grinding them before burning, as I have done on a large scale with a limestone which was completely devoid of hydraulic properties when burnt and slaked in the ordinary way. Will H. Ambrose kindly inform us of some poor lime containing no alumina? I have made numerous analyses of poor and hydraulic limestones from different localities, but have never yet met with one devoid of alumina. It would also be highly interesting to hear something more about the *softening* of lime through the absorption of carbonic acid, the chief authorities on the subject having hitherto considered that carbonic acid played an important part in the induration or *hardening* of lime mortars.—Walter F. Reid.

[5773.]—**Lime, "Poor" and "Rich."**—These adjectives are generally used to express the hydraulicity or otherwise of the lime, though the terms are not altogether applicable as descriptive of this property. "Poor lime" is lime which contains ingredients, such as sand, having no chemical action upon the carbonate, and therefore it is not altogether true to say it is hydraulic. Poor limes slake slowly, and expand very little. Hydraulic lime contains, besides the carbonate, foreign constituents that combine chemically and produce setting under water. The terms are thus not altogether interchangeable. "Rich or fat" limes are those derived from the calcination of pure or nearly pure carbonate of lime, without foreign ingredients, and in the process of slaking they crack and swell with a considerable evolution of heat. The classification of limes has been arranged as follows: 1, rich, fat, or pure limes; 2, poor limes; 3, hydraulic limes. It will be observed, from what I have stated, that hydraulic lime, inasmuch as it is not a pure lime is rather to be classed under "poor" or meagre than "fat" lime, and hence the confusion that has arisen. H. Ambrose's quotations prove this. Hydraulic limes contain a large percentage of clay, magnesia, &c., but when carbonate of magnesia is present to a large degree lime is rendered hydraulic, and the magnesian limestones of Yorkshire produce eminently hydraulic limes.—G. H. G.

[5787.]—**Strains on Collar Beam Roofs.**—The first and most important part of the construction is that the walls should be strong enough to resist the thrust of rafter; if the collar is above the walls or foot of rafter, then the collar is, as "S." says, simply a strut; if the collar is put in tension, it shows that the walls have spread. The only use of a collar as regards strength is that it shortens the span or length of bearing of rafter, thereby saving material by reducing the sectional area of rafter. The load on beam is distributed, and requires the same sectional area proportions as are inclined to a horizontal beam—that is, section × by length of rafter between supports, and divide by the horizontal span between the same supports. I am at present designing a cupola roof to cover a floor space 47ft. × 37ft. without any intermediate ties or supports between floor, and a curb on the top for carrying wood shaft 33ft. above floor and 24ft. above walls. I am working on the theory of "S.," inclined struts carrying a load above the collar, keeping in mind the very important part the wind takes in the strains on a roof, particularly high-pitched ones. It always has a tendency to racking the roof at the point of intersection of collar and rafter, which in my case acts as a lever, but in that of "S." as a load on an inclined beam, whose weakest part is at the collar by being mortised for tension of collar, and supported by another beam (opposite rafter), same section, &c., as the wind will exert the greatest strain on the roof in that position in which it is least able to bear it, *i.e.*, at right angles to the walls.—B. S.

[5803.]—**Proportion in Church Architecture.**—Errata.—In last week's reply, 2nd column, 22nd line, read "perpendicular to the plane of same" instead of "perpendicular to the plan of same."—H. A.

[5809.]—**Extras.**—It is quite right for an architect to charge 5 per cent. on extras if those extras have been carried out under his supervision; but it is certainly wrong to charge 2½ per cent. for quantities if no quantities have been provided for such extras.—William Jackson.

[5811.]—**Store Floors.**—In reply to "Safety," I shall presume that he has his longitudinal beam and columns already correctly calculated; but if he is not quite sure, I would advise him to ascertain, and especially concerning the columns, &c. Iron flitches are in strength to pitch pine as about 5 to 1, the sectional area being the same, and provided they be prevented from twisting. In price they are about as 15 to 1, the area being the same, and therefore strength for strength, the iron is about three times the price of the pitch pine, and therefore where space matters not, pitch pine is the cheapest and best. To calculate the strength required for each cross binder, and which should have a long bearing across the wall on a York stone corbel, and to be two-thirds the thickness of wall so as to give a fair pressure on the centre of the wall, we can call the bearing in the clear 12ft., then 6 × 12 = 72ft. super. of floor space; and let us suppose the height equal to 9ft. in the clear. Let us discover the weight. A bushel of new wheat will weigh 62lb., and a cubic foot about 50lb., and when placed in sacks will, if there be several, occupy about a quarter of its own space, added to its own space for interstices between sacks, &c., and therefore the space covered will only have about 4-5ths of the weight per foot super., viz., 50lb., and which will then be but 40lb. per foot super. and 1ft. high; whence 9ft. high will give 360lb. per foot super., equal to 3cwt. 24lb., and if we say 30lb. as the weight of the floor (it would be about 20lb.) we obtain 3½cwt. as the safe load per foot super. the floor is to carry, including its own weight; but if the height were made much more the weight would increase in proportion, and might then become 4cwt., or even more. 72 × 3½ = 252cwt. = safe distributed load, and 252 ÷ 2 will be = 126cwt. = safe load on the centre, and 126cwt. × 4 will be 504cwt., and equal to the required breaking weight on the centre of binder. Now, to discover the scantling, let us determine on 12in. as the depth and discover the breadth. At 12in. between supports and 1in. square a piece of pitch pine will break with, say, 5cwt.; then 12in. deep with 144 × 5cwt. = 720cwt., and if 12ft. between bearings, then with 720 ÷ 12 = 60cwt. and 504cwt. ÷ 60 will give 8·4in. as the breadth, and therefore scantling will be 12″ × 8½ or 12″ × 9″. Then for a floor 25′ 6″ between walls, we shall say 12ft. 9in. between bearings, say 13ft., and we had 12ft. before, and in the 13ft. between bearings, if we consider the same scantling as before, we have now but 12-13ths of the strength, but our weight has increased by 1-13th of our present weight, or by 1-12th of our former weight. Let us first adjust our scantling for the increased length and the former weight, 1-13th of 9in. will be 9-13ths of 1in., say ¾; but as we required but 8½, let us now say 9¼ as our new breadth to carry former load. Now we require to add 1-12th of this scantling because we have 1-12th of the former load in addition, and 1-12th of 9¼ will be, say, ¾in., and therefore = 10in., and the real scantling required for the lesser length was 8·4″ broad, and we have therefore about 1½in. more in breadth, the depth being as before, 12in., whence our scantling is now 12in. deep × 10in. broad. "Live load," as I understand it, refers to a moving load, as on a railway or bridge, with a road over it, and does not apply to a stationary load. "Safety" did not know what weight was on the floors: how did he arrive at his columns and longitudinal beam? When the sacks are placed one on the other, they will flatten much at the sides, and therefore become denser for the same space, and therefore might occupy perhaps 1-7th more space, and therefore might bring the weight for 9ft. in height nearly as high as, say, 4cwt., when the scantlings obtained would be none too strong. Knotty sides of beams should always be placed uppermost; if undermost, they will, if 1-8th deep, take away about half the strength of the beam. If placed uppermost, they will not weaken it; and if they come in the way of the spikes, they should be bored. But the necessary care might not be taken, but the beams split and weakened thereby, whence is a good reason why trenails, previously driven through an iron gauge and then into holes bored, would be the best fastening.—Henry Amaaose.

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The President, Sir Frederick Leighton, and the members of the Royal Academy of Arts gave a *conversazione* on Wednesday evening at Burlington House, Piccadilly.

WATER SUPPLY AND SANITARY MATTERS.

Canterbury.—On Wednesday week, an inquiry was held at the Guildhall, Canterbury, before Mr. John Lambert, an inspector of the Local Government Board, into an application from the corporation for sanction to borrow £3,500 to carry out a scheme of sewerage. Mr. J. G. Hall, the city surveyor, explained the plan he has devised, stating that the sewage would be pumped a height of 8ft., would be passed through mechanical filters, and passed upon 18 acres of land in a clarified state. From 800,000 to a 1,000,000 gallons of sewage would be disposed of daily, and under cross-examination Mr. Hall said he considered the site was large enough, and that 12 gallons of liquid could be received on each square yard of its surface. Opposition was raised to the scheme on the grounds of its costliness, and the small size of the proposed filtration area.

LEGAL INTELLIGENCE.

Tramways and the Repair of Roads.—A summons was recently taken out at the Marylebone police-court by the London Carriage Owners' Protection Society against the North Metropolitan Tramways Company to compel them to keep the roads used by them in proper order. The case was dismissed on the ground that the Metropolitan Board of Works or the Vestry were the only parties who could sue. The case was taken to the superior court, and argued before Mr. Justice Hawkins, who decided that the magistrate had rightly dismissed the summons. The Carriage Owners' Protection Society have consequently appealed to the Metropolitan Board of Works to enforce compliance with the Acts of Parliament, and that board has the point under consideration in committee.

CHIPS.

A new Wesleyan chapel was opened at Burnham, Somerset, on Wednesday week. It was designed by Mr. Alexander Lauder, of Barnstaple; and has been erected by Mr. Kitch, builder, of Bridgwater. It is Gothic in style, and is constructed in mountain limestone with freestone dressings. The interior fittings are of stained pitch-pine. The cost has been £1,300.

The foundation-stone of a new Primitive Methodist School-chapel was laid at Hoddlesden, near Darwen, on Saturday. Messrs. Thackeray and Woods, of Darwen, are the architects; Mr. John Knowles has taken the contract for masonry, and Mr. W. Kay that for joiners' work. The building will be Gothic in style, with open-timbered pitch-pine roof, and will accommodate 250 scholars. The cost will be £t50.

The tower of Melton church, near Huddersfield, has just been fitted with a carillon playing fourteen tunes on ten bells; it has been furnished by Messrs. Gillett, Bland, and Co., of Croydon.

The London and Middlesex Archæological Society yesterday (Thursday) afternoon visited the very interesting Collegiate Church of St. Saviour's, Southwark-bridge, in which a lecture describing its architectural history and character was read by Mr. F. T. Dollman, who has for a dozen years past made the building an object of study. The members afterwards proceeded to Wren's Church of St. Mary-at-Hill, in Eastcheap, where the rector, the Rev. Arthur Trower read extracts from the ancient registers and churchwardens' accounts. We shall publish a full report of the meeting next week.

The corner-stones of a new Primitive Methodist chapel were laid in Grange-road, Haslingden, on Saturday. The chapel will be built of stone, and will cost £4,500. Beneath it will be a schoolroom and vestries.

At a meeting of the Bournemouth Improvement Commissioners, held on Tuesday, the question of the outfall for the sewerage works was discussed, and it was decided that as the Local Government Board had declined to sanction the borrowing of money for the purpose of carrying out the foreshore and esplanade scheme devised by Mr. Creeke, the outfall should now be carried under the pier straight out to sea, a distance of some 1,200 or 1,300ft.

At the East Kent quarter sessions, on Tuesday, Charles Edward Andrews, builder, of Ashford, a bankrupt, was indicted for having disposed of about £100 worth of furniture, &c., with intent to defraud his creditors. He was found guilty and was sentenced to six months' imprisonment with hard labour.

The Midland and North-Eastern Railway Companies opened on Tuesday their new Swinton and Knottingley joint line for passenger traffic.

The corner stone of new board schools at Spring-grove, Huddersfield, was laid on Monday week. The schools will accommodate 308 boys, 308 girls, and 467 infants, and the cost per head will be £12 18s. 7d.

Our Office Table.

Ipswich has, for an East Anglian borough and port, increased in size and importance with unusual rapidity. The population is now four times the number living in the town at the beginning of the century. Many of the public works and buildings and town improvements this steady advance in prosperity has demanded have been deferred till they have become absolutely necessary, the consequence being that now that the town council are waking to a sense of their responsibility these duties are crowding thick upon them. At the present time they have in hand the construction of new entrance to dock, estimated to cost £60,000; erection of new post-office and school-board offices, which Mr. Barry reports cannot be provided for £7,000; new museum which will also certainly exceed the estimate, £10,000; extensive and expensive repairs to the new town hall; new board schools and additions; street improvements; a tender amounting to £43,000 was last week accepted for a system of sewerage into the river Orwell, the outfall being several miles below the town; a series of tramways are about to be formed through the town by a limited liability company; and this week an advertisement appears in our columns announcing a fresh competition in which 100 guineas premium is offered by the council for the best design for a new corn-exchange, shops, and offices, to be built adjoining the town-hall, so as to form a complete block of public buildings.

We are not surprised to find that in the competitions recently decided the town council of Ipswich have failed to give unmixed satisfaction to competitors. A correspondent signing himself "A. B. C." writes, with reference to the Public Hall Alteration competition in that town, drawing attention to the report of a committee of the Ipswich town council, in which they state that, having considered the plans prepared by Mr. Horace Cheston, to which the premium of £50 was awarded, they cannot recommend their adoption, as, amongst other objections, they will "entirely unfit the hall for the use to which it has been put." "A. B. C." adds, "The principal condition in this competition was that the hall was *not to be unfitted* for its present uses, but from the above paragraph it will be seen that the premium has been awarded to a competitor who has violated the conditions."

Another of the competitions just settled in Ipswich, that of the Museum and School of Art buildings, has provoked even more controversy amongst those who were induced to take part in it. We referred last week to the discussion the committee's first decision had caused, and to the strange change of front that occurred on a reconsideration of the matter. The following brief grumble we clip from a local newspaper:—"Why is it that the three designs (the best, of course) that were selected and submitted to Sir Richard Wallace were afterwards thought of insufficient merit for the premiums? At present the proceedings of the committee appear absurd to a Competing Architect."

The New York *Tribune* gives a detailed report of the brick industry on the Hudson River, with the names of the principal firms engaged in the business, the capacity of the works, the output last year, the present supply, and the number of hands employed. It appears that between Tarrytown and Albany there are upward of 150 brickyards, varying in productive capacity from 20,000 to 140,000 bricks a day in the working season. Most of these are on the west bank of the river, which furnishes an inexhaustible supply of proper material. The sand is usually found at the surface, and the clay a few feet below, although the latter is frequently obtained at the surface and the sand at another point near at hand. The tempering-machines and brick-presses are now nearly all run by steam-power; but the material is still carted by horses, and all other parts of the labour are performed by hand. The wages paid last year ranged from 60 cents to 3 dols. a day, according to skill and ability to perform, "boss" burners getting the highest wages and boys the lower rate; the whole averaging above 1 dol. 25 cents a day. The leading establishments—seventy or more in number—have a daily capacity of more than 4,000,000 bricks. The great brick centre is Haverstraw Bay, where about 40 separate manufacturers are established, including the largest on the river.

DRESDEN this year is anxious to follow the lead given by Antwerp, Basle, Florence, and other towns which from time to time have had exhibitions of the working of the painters whose names are mostly associated with those places. Dresden, however, not having any special celebrity of its own, elects for its representative Raphael, whose one great work (the Sistine Madonna) in the Dresden Gallery is, perhaps, the finest specimen of the great Florentine north of the Alps. It remains to be seen what response the projectors of the Raphael Loan Exhibition will receive from the art collection of northern Europe. The exhibition is not limited to oil paintings, but will include drawings and studies by Raphael himself, and specimens of the most valuable reproductions, engravings, mezzotints, etchings, and photographs of his works in public and private galleries. The exhibition will open early in August, and though not likely to be exhaustive, or even approaching completeness, it cannot fail to be attractive and interesting.

A DEPUTATION from the Lambeth Vestry and Wandsworth Board of Works had an interview on Monday with Mr. Cross, at the Home Office, to ask for the appointment of a Royal Commission to inquire into the inadequate state of the sewers for the prevention of floods. Sir H. W. Peek introduced them, and stated that owing to the defective and deficient construction of the main-drainage sewers in the dictricts of Lambeth and Wandsworth, not only dozens but hundreds of thousands were constantly flooded at nearly every great rainfall, thus, besides damaging property, seriously affecting the health of the inhabitants. The floods of which they complained were getting worse every year. In 1877 there were three floods from rainfalls, irrespective of floods arising from the overflow of the Thames. In 1878 there were in the Wandsworth district 200 houses flooded; in January, 1879, 450; in May last about the same number; and a short time ago, 440. The medical officer's report on the subject set out that in the parish of Battersea, which had been flooded last January and February, nearly all the inhabitants living in the houses so flooded were more or less affected by diseases likely to result from sewage flooding, such as typhoid fever, &c. The floods also impregnated the houses with deposits of sewage. The board had taken advice from the Attorney-General and Mr. E. Clarke, who recommended them to apply to the Home Secretary, and they hoped that an inquiry would be granted by him. After a conversation, in which it was urged by the deputation that the Metropolitan Board of Works had neglected its duty, Mr. Cross said the deputation wanted him to go a great deal farther than instituting an inquiry. He added, "You ask me to make inquiries and to prosecute. I have the power to make inquiry and to prosecute, if I think fit. Of course this state of things ought not to continue, and in some way or other it ought to be remedied. I shall not say more than that to-day, but I shall consider the question."

M. LEFEVRE DE SUCY, President of the Société des Géomètres of France, and of the Provisional International Committee of Surveyors, was entertained at dinner on Monday week by the President and Council of the Institution of Surveyors, in the hall of the institution, No. 12, Great George-street, Westminster. The President (Mr. W. Sturge) was supported by the Hon. J. K. Howard, the Hon. C. A. Gore, Mr. G. Ridley, Mr. J. H. Lloyd, Dr. Voelcker, Mr. J. R. Bourne, and other visitors and by a large representation of the Council. M. Lefèvre, whose health was proposed by the President in very complimentary terms, expressed the pleasure which he felt in accepting the hospitality of his professional brethren in England, and in renewing an acquaintance formed under such agreeable circumstances with the members of the English Delegation to the International Congress of Surveyors held in Paris in last July. He concluded by inviting the English members of the International Committee to the meeting to be held in Paris on the 21st of July next, when it is intended to formally constitute the permanent International Committee.

A DISTRESSING case of wholesale poisoning, through criminal ignorance or worse, has just occurred in a country school in Vermont (U.S.) The school opened Monday, May 26th, and as usual the children got their water from a little brook that ran close by. The teacher noticed the bad taste of the water, and forbade its use; but the caution came too late or was neglected, and in a little while seventeen of the children were prostrated with alarming illness, ten or twelve dying within a day or two, the bodies of the dead corrupting so rapidly that immediate burial was necessary. Investigation showed that a farmer had polluted the stream by the carcasses of a horse and several sheep, and the drainage of his barnyard. A medical investigation resulted in a report that diphtheria was the cause of the terrible mortality, aggravated by poisoned water.

THE Bill for spoiling London Bridge has been referred to a Select Committee, and we trust we shall hear no more of it. Lord Carnarvon's action in the matter, backed by the protests of Mr. Street and others, has at any rate obtained a postponement of the scheme, and will probably insure a full inquiry. We have received numerous suggestions from outsiders during the week of means for widening the bridge without destroying its appearance. We can only repeat what we have said all along, that it is useless to widen the bridge at all with the view of facilitating traffic unless the northern and southern approaches from Shoreditch Church to St. George's Church in the Borough can be uniformly widened at the same time. No line of thoroughfare can be considered wider than its narrowest part, and the only really effectual means of relieving London Bridge is the erection of another bridge lower down the Thames. It must come to this sooner or later.

THE following are the admissions this month at the Architectural School, Royal Academy:—1st class: P. Green, W. T. Gooch, W. G. Lewis, and A. T. Kirby. 2nd class: C. P. Leach, C. E. Holmes, F. Littlewood, W. B. Smith, J. J. Jones, F. G. Hooper, and C. A. Smith. Probations: C. Marshall, F. W. Richardson, W. Bucknall, E. G. Hardy, B. J. Dicksee, J. C. Hambling, G. Fresch, A. S. Haynes, J. H. Curry, E. A. Woodrow, and J. W. Simpson.

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128, Queen Victoria-street, St. Paul's, E.C.; and
68, St. James's-street, Pall Mall, London.—[ADVT.]

Holloway's Ointment and Pills should be sought by the aged when oppressed by varicose veins, swelled legs, occasional cramp, or aches about the ankles and feet. These remedies will give both comfort and security against ulcerations and all neuralgic tortures, which too often break the rest and drain the constitution.—[ADVT.]

CHIPS.

We gave currency last week to the report that Cooper's Hill College was to be closed. The *Engineer* contradicts the rumour, and *Truth* re-asserts it.

The Rural Sanitary Authority of East Ward, Westmoreland, have instructed Mr. Watson, C.E., to prepare plans and estimates for sewering the district of Bongate, in conjunction with the sewerage of Appleby.

A new Congregational church is about to be erected in Edge-lane, Urmston, Lancashire. The architect has been selected in competition, and Mr. Roger F. Tolson, of Manchester, has been appointed The accepted plans are 13th-century Gothic in character.

Fullwood Congregational chapel, Pitminster, Somerset, has been reopened after renovation, including new floors and seats. The contract was carried out by Mr. C. Withyman, of Corfe.

A new loop line of railway at Brighton was opened for traffic on Tuesday. It diverges from the main line at Preston Park, the northern suburb of Brighton, and joins the Portsmouth line at Cliftonville, or "West Brighton," as it will henceforth be designated.

At the Surrey Quarter Sessions held on Tuesday, it was decided to raise the salary of the county surveyor to £1,200 per annum, on account of his many years' services and the great additions that have been made to his duties by recent legislation.

The members of St. Paul's Ecclesiological Society will visit St. Alban's Abbey to-morrow (Saturday) afternoon, under the conduct of Mr. G. Gilbert Scott.

The Alfreton Local Sanitary Committee have provisionally accepted the highest of three tenders sent in for the construction of a new reservoir at Somercotes—that of Messrs. Colson Brothers, amounting to £3,675 11s. 7d., and the action has been confirmed by the Belper Rural Authority. The lowest tender was £676 lower.

The new free library at Derby was opened on Saturday by its donor, Mr. M. T. Bass, M.P.

In our notice of the opening of Thurles Cathedral last week (p. 765, last vol.) it should have been stated that the builder of the cathedral was Mr. McMullen, of Mary-street, Cork. Mr. Newstead, of Fermoy, has carried out the recent works of improvement under Mr. G. C. Ashlin, and not the entire undertaking, as the paragraph would imply.

The first step towards the erection of Churcher's College, Petersfield, was taken on Wednesday by Mr. Crickmay, the architect, Mr. Soames, the clerk to the Governors, and Mr. Crook, of Southampton, the contractor, setting out the building, and workmen are now engaged excavating for the foundations, &c.

Mr. Frederick Walsh has been appointed borough surveyor of Burnley, Lancashire, at a salary of £200 a year, vice Mr. Edwards, resigned.

A game of cricket took place on the Abbey Ground, Thetford, on Saturday afternoon, between eleven carpenters and eleven bricklayers who are at work on the new grammar school. After a well-contested game the bricklayers became the winners. The bowling of Mr. Prentice, clerk of works, was very effective.

It has been decided that the memorials to Major Whyte-Melville shall take the forms of a drinking-fountain to be erected at St. Andrew's, a monument over the grave at Tetbury, and a tablet in the Guards' Chapel.

The new line extending the London and North-Western Railway system from Bettws-y-Coed to Festiniog—the great slate quarrying district of Merionethshire—has been opened this week for passenger traffic.

The total cost of the new Palace of Justice at Brussels is estimated, in the report addressed to the Chamber of Deputies, at about 41,000,000 francs. It will still require five years to terminate the building.

MEETINGS FOR THE ENSUING WEEK.

TUESDAY.—City of London School Competitors Committee—At the Cannon-street Hotel. 3 p.m.

Lamplough's Pyretic Saline is refreshing most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALLPOX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[ADVT.]

Trade News.

WAGES MOVEMENT.

SHEFFIELD.—A meeting of master builders was held on Monday night. The masters agreed, by resolution, to accept 8d. per hour as the rate of wages, being a reduction of ½d. per hour, but they resolutely declined to sign the old rules. It was stated that all vacancies could be readily filled on these conditions. The original demand of the masters, it will be remembered, was a reduction of 1d. per hour.

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TENDERS.

ALFRETON.—For the construction of a reservoir at Somercotes, to supply Alfreton with water, for the Belper Rural Sanitary Authority:—

Colson Brothers (accepted) ...	£3,675 11 7
Millington	3,161 0 0
Eckett and Co...	2,909 10 9

BATH.—For a new roof to part of workhouse, for the Bath Board of Guardians:—

Wibley, C. (accepted)	£219 10 0

BRENTFORD.—For proposed studio and residence, Boston-road, Brentford, for M. Auguste Ballin. Messrs. Smithies and Gladman, architects:—

Brunsden	£1,375 0 0
Gibson	1,250 0 0
Beauchamp	1,219 0 0

Cubitt Town, E.—For the enlargement of the Glengall-road schools, Cubitt Town, by 200 places, for the London School Board. Mr. E. R. Robson, architect to the Board :—

Limn, G.	£2,898	0	0
Jerrard, S. J.	2,156	0	0
Wall, Brothers	2,126	0	0
Wood, F. and F. J.	2,114	0	0
Cox, C.	2,083	0	0
Atherton and Latta	2,010	0	0
Sheffield and Prebble*	1,989	0	0

* Accepted, plus £125, for provisions not included in tender.

[Cost of extension of school buildings, including covered playground, £1,612 ; cost of alteration to existing buildings and w.c.'s, &c., £347 ; cost of foundations to main buildings, £155 : cost per head of enlargement only, £10 11s. 4d. ; cost per head of complete school, £11 7s. 9d.]

Darwen.—For new co-operative stores for the Provident Co-operative Society (Limited). :—

Kay, W.	£715	0	0
Heavyside, J.	710	0	0
Orrell, J. and Sons (accepted)	690	0	0

East Kent.—For the erection of external water-closets at Barming-heath County Pauper Lunatic Asylum, for the Magistrates of Kent :—

Clements and Wallis (accepted)	£3,496	0	0

Fulham, S.W.—For the erection of a school for 600 children (with desks five rows deep), in North-end, Fulham, for the London School Board. Mr. E. R. Robson, architect to the Board :—

Marsland, J.	£5,770	0	0
Higgs and Hill	5,569	0	0
Shepherd, W.	5,550	0	0
Jerrar, S. J.	5,541	0	0
Thompson, J.	5,377	0	0
Aitchison and Walker	5,232	0	0
Brass, W.	5,178	0	0
Hook and Oldrey	5,177	0	0
Hobson, J. D.	5,158	0	0
Wall, C.	5,110	0	0
Tongue, W.*	5,006	0	0

* Accepted, with an addition of £100 for plastering.

[Cost of site (area 31,020 square feet) £3,154 9s. ; cost of school buildings, including teachers' rooms and closets, £4,270 ; cost of tar pavement and playground, £220 ; cost of boundary walls and gates, £266 ; cost of schoolkeeper's house, £350 ; cost per head of school buildings only, £7 2s. 4d. ; total cost per head of buildings, including boundary walls, schoolkeeper's house, &c., £8 10s. 2d.]

Hampstead.—For house and studio, Hampstead-hill-gardens, for Mr. T. Collier. Messrs. Batterbury and Huxley, architects :—

Exclusive of fence, walls, and fittings :—

Manley	£3,290	0	0

Hampstead.—For detached villa residence, Hampstead-hill-gardens. Messrs. Batterbury and Huxley, architects :—

Manley (estimated cost)	£3,000	0	0

Haverstock-Hill.—For repairs and painting to the Orphan Working School. Mr. Alfred R. Pite, architect, 44, Bloomsbury-square, W.C. :—

Harper	£714	0	0
Staines and Son	528	0	0
Boden	510	0	0

Ipswich.—For the execution of sewerage works for the Town Council. Mr. Peter Bruff, C.E., engineern :—

Pearson and Sons, of Bradford*	£43,000	0	0

* Recommended for adoption.

Ipswich.—For repairs to the Town Hall. Mr. Frederick Barnes, of Hatton-court, Ipswich, architect :—

Bennett and Co., of Ipswich*	£1,210	0	0

* Accepted.

[Lowest of five tenders received.]

Leatherhead.—For the erection of detached villa residence, Belmont-road, for Stephen Walker, Esq. Messrs. Smithies and Gladman, architects :—

Hickenbotham (accepted)	£1,195	0	0

Leatherhead.—For the erection of a pair of semi-detached villas, Belmont-road, Leatherhead, for Stephen Walker, Esq. Messrs. Smithies and Gladman, architects :—

Hickenbotham (accepted)	£1,145	0	0

Islington, N.—For the erection of a school for 1,200 children (with desks five rows deep) in Wenlock-road, New North-road, for the London School Board. Mr. E. R. Robson, architect to the Board :—

Brass, W.	£10,552	0	0
Perry and Co.	10,416	0	0
Peto, Bros.	10,161	0	0
Roberts, L. H. and R.	10,045	0	0
Pritchard, G. S.	9,991	0	0
Hook and Oldrey	9,990	0	0
Boyce, T.	9,894	0	0
Wall, Bros.	9,872	0	0
Lawrence, E.	9,716	0	0
Atherton and Latta	9,566	0	0
Grover, J.	9,488	0	0
Cox, C.	9,453	0	0
Kirk and Randall*	9,424	0	0

* Accepted, plus £550, for provisions not included in tender.

[Cost of site (area 17,850 square feet) £10,537 4s. 9d. ; cost of school buildings, including teachers' rooms, closets &c., £9,005 ; cost of tar pavement and playground, and covered playground on roof, £244 ; cost of boundary walls and gates, £320 ; cost of schoolkeeper's house, £405 ; cost per head of school buildings only, £7 10s. 1d. ; total cost per head of buildings, including boundary walls, schoolkeeper's house, &c., £8 6s. 2d.]

Islington, N.—For the erection of a school for 1,000 children (with desks five rows deep) on the site in Thornhill-road, for the London School Board. Mr. E. R. Robson, architect to the Board :—

Webber, C.	£9,426	0	0
Roberts, L. H. and R.	9,318	0	0
Brass, W.	9,160	0	0
Pritchard, G. S.	9,055	0	0
Grover, J.	8,994	0	0
Lawrence, E.	8,993	0	0
Boyce, T.	8,990	0	0
Williams, G. S. S. and Son	8,924	0	0
Cox, C.	8,867	0	0
Wall, Brothers	8,700	0	0
Aitchison and Walker*	8,271	0	0

* Accepted, plus £430, for provisions not included in tender.

[Cost of site (area 20,870 square feet) £4,757 ; cost of school buildings, including teachers' rooms and closets, £7,626 ; cost of tar pavement and playground, £457 ; cost of boundary walls and gates, £618 ; cost per head of school buildings only, £7 12s. 6d. ; total cost per head of buildings, including covered playgrounds, schoolkeeper's house, &c., £8 14s.]

Leicester.—For new lecture hall and club premises, &c., in Humberstone Gate, for the Leicester Secular Hall Company. Mr. W. Larner Sugden, architect, Leek. Quantities supplied by the architect :—

Hewitt, Geo.	£2,750	0	0
Plant, A.	2,730	0	0
Bromage, F., Derby	2,412	0	0
Riddett, J.	2,324	0	0
Bland, H. and Son	2,315	0	0
Kellett, J. C.	2,297	0	0
Butteris, C.	2,290	0	0
Burdett, J.	2,210	0	0

Excavator, bricklayer, tiler, carpenter and joiner :—

Hutchinson	£1,984	0	0
Herbert, T. and W.	1,898	0	0

Excavator, bricklayer and tiler :—

Collier, C. J.	£970	0	0
Riddett, J.	888	0	0
Taunt and Smith	885	11	6
Burdett, J. (accepted)	829	6	0
Butteriss, C. (withdrawn)	765	0	0

Carpenter and joiner :—

Harrison, Prime & Wood, Buxton	£1,193	0	0
Marston	830	0	0
Senfield, J.	817	14	9½
Pailthorpe	765	0	0
Riddett, J.	754	0	0
Ratnett, H. F.	738	15	0
Cox, J.	697	10	0
Wilson, R., Darlington (accepted)	635	0	0

Ironfounder and Smith :—

Illston (accepted)	£105	6	0
Holden, R. W., Sheffield (heating only)	60	0	0

Plasterer :—

Collier, C. J.	£156	0	0
Marston	103	0	0
Austin, Robert (accepted)	99	10	0
Wheatley (withdrawn)	73	0	0

Stonemason :—

Staymaker, Collin and Cromton	£320	0	0
Marshall and Castle	295	0	0
Hayes, Harry, Stafford	253	5	0
Goffey, John	251	14	0
Riddett, J.	251	10	0
Lindley, W. (accepted)	240	0	0

Plumber, &c.

Adams, A.	£250	0	0
Matts and Biggs	245	0	0
Hill, W. (accepted)	209	10	0

Putney.—For new wing to the Royal Hospital for Incurables, West-hill, Putney. Messrs. Searle, Son, and Hayes, architects, 66, Ludgate-hill, E.C. Quantities by Mr. L. C. Riddett, 30, Bedford-row, W.C. :—

Little	£22,399	0	0
Mark, Patrick, and Sons	22,300	0	0
Conder, E.	21,970	0	0
Holland and Hannen	21,890	0	0
Brass, W.	21,853	0	0
Dove, Bros	21,725	0	0
Rider, Thos. and Sons	21,692	0	0
Colls and Sons	21,587	0	0
Shaw, Geo.	21,174	0	0
Higgs and Hill	20,944	0	0
Goodman, W. (accepted)	19,988	0	0

Romford.—For making roads and laying drains, gullies, &c., on estate at Romford, for the Birkbeck Freehold Land Society. Mr. St. John H. Hancock, Furnival's Innsurveyor :—

Pound, P. G. (accepted)	£2,400	0	0

(Granite curbing extra.)

Southwark, S.E.—For erecting a cookery centre and schoolkeeper's house at Hunter street school, for the London School Board. Mr. E. R. Robson, architect to the Board :—

Higgs and Hill	£798	0	0
Hobson, J. D.	700	0	0
Tyerman, J. (accepted)	612	0	0

Upper Holloway, N.—For the enlargement of the Hargrave Park-road school, by 467 places :—

Langmead and Way	£6,150	0	0
Roberts, L. H. and R.	4,910	0	0
Patman and Fotheringham	4,784	0	0
Nightingale, B. E.	4,783	0	0
Lawrence, E.	4,661	0	0
Pritchard, G. S.	4,642	0	0
Aitchison and Walker	4,609	0	0
Williams, G. S. S. and Son	4,597	0	0
Hobson, J. D.	4,594	0	0
Hook and Oldrey	4,587	0	0
Grover, J.	4,534	0	0
Boyce, T. (accepted at £3,965)	4,494	0	0

[Cost of extension of school buildings, including closets, £3,695 ; cost of extension of playground, boundary walls and gates, £270 ; cost per head of enlargement only, £8 9s. 9d. ; cost per head of complete school, £12 1s. 5d.]

Wandsworth, S.W.—For the erection of a school providing seat accommodation for 600 children (with desks 5 rows deep) in Warple-way, Wandsworth, for the London School Board. Mr. E. R. Robson, architect to the Board :—

Higgs and Hill	£5,694	0	0
Brass, W.	5,672	0	0
Thompson, J.	5,572	0	0
Wall, Bros.	5,469	0	0
Lathey, Bros.	5,468	0	0
Grover, J.	5,416	0	0
Tyerman, J.	5,382	0	0
Pritchard, G. S.	5,369	0	0
Hobson, J. D.	5,319	0	0
Downs, W.*	5,225	0	0

* Accepted at £4,775.] Cost of site (area 31,110 square feet) £820 15s. 2d. ; cost of school buildings, including teachers' rooms and closets, £4,465 ; cost of tar pavement and playground, £155 ; cost of boundary walls and gates, £275 ; cost of schoolkeeper's house, £340 ; cost per head of school buildings only, £7 8s. 10d. ; total cost per head of buildings, including boundary walls, schoolkeeper's house, &c., £8 14s. 6d.]

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THE BUILDING NEWS.

LONDON, FRIDAY, JULY 11, 1879.

THE CITY OF LONDON SCHOOL COMPETITION.

HAVING at last been permitted to make an examination of the designs for the City of London Schools, which, as we stated in our last issue, will be publicly exhibited on and after Monday next, we are now able to complete our review of them. Since our last notice the School Committee have reversed the order of their recommendation as to the second and third designs, the position of the selected plans being now as follows: 1, "Live and Learn" (Messrs. Davis and Emanuel); 2, "Playgrounds" (Mr. T. E. Knightley); and 3, "Simplicity" (Mr. T. C. Clarke). These we have already described. We are not in a position at present to say on what grounds Mr. Knightley's design has been placed before Mr. T. Chatfeild Clarke's, though it has been alleged the alteration of the resolution has been arrived at from the reconsideration of certain points of the plan and the condition as to the cubical space to be allowed per boy, and urged in an anonymous circular lately addressed to the Common Council. We understand also that it is intended to award "honourable mention" to three other designs—namely, "Palmam qui Meruit Ferat," "L.," and "Move," all of which are considered to possess great merit.

As we have before hinted, there are several crucial points to be determined by the Corporation in the selection of a plan. One of leading moment is the respective areas of playground and building, so that one may not encroach unduly on the other, and this point can only be determined by carefully estimating how large an area (at the limit of area per boy) should be devoted to the building. Of course, there are many plans that show covered playgrounds under the whole of the building; others that only set apart a portion of that area to the purpose, and in coming to a decision on this point, care must be taken to do justice to each design. The next essential point is undoubtedly the relative position of the assembly hall and class-rooms, so that they may be in easy communication and yet distinct, as regards the public utilisation of the former. Then it is equally desirable that the corridors leading to the class-rooms should be practically distinct from those giving access to the administrative apartments; they should be so arranged, also, that the students may not be brought into collision. Another very urgent consideration is the lighting of the class-rooms, and their position would naturally affect this. The north-eastern and western sides are probably the best, though the latter is exposed to some inconveniences. Other considerations are: convenient location as regards the chemical department, the lecture-theatre, culinary department; ready access by properly-placed staircases, convenient latrines, good ventilation, &c. Cost is, perhaps, a secondary consideration, though the cubical space per pupil, with economy in general distribution of the departments, should be carefully taken into account with the other elements we have mentioned.

We commence with the plans which are recommended as deserving of mention. "Palmam qui Meruit Ferat" is a symmetric plan: the hall, 91ft. by 59ft., occupies a central position on the ground floor, the axis running north and south. The class-rooms are placed on both sides, the administrative rooms being in front. Continuous corridors surround the hall, giving access to it and to the class-rooms which debouch upon them. This arrangement is a very normal one, but it has the merit of compactness and convenience of communication. We note a few good points; the latrines are placed on the north side, the staircases are at the ends of corridors, and the domestic apartments are situated at the south-east angle, with dining-hall above, out of the way of the teaching departments. The author obtains a covered fives' court next the hotel, by which a tolerable space intervenes between the two buildings. A covered playground is obtained under all the buildings except the hall. The lecture theatre is at the north end of west wing, above the class-rooms. Good plans and architecture are seldom combined, and in this case the elevation is below par. The perspective shows an octagon dome over entrance-hall, the drawing of which is faulty, and there is a portico of two orders in front. The windows are three-light, certainly not elegant in the pediments, which are both curved and triangular, and there is a want of proportion in the general massing. "L." has certainly a more artistic arrangement in the elevation, which is Palladian in style, of three orders of pilasters, the low buildings of the master's and secretary's offices forming a single-story Elizabethian screen in front, the hall with its side facing the Embankment, is recessed and flanked by two cupolas, very suggestive of a well-known building by Thorpe. Its plan, a hollow square, shows the great hall 103ft. by 46ft., forming the northern block lengthwise, abutting against side wings. The public entrance to the hall is very direct, and the class-rooms—four of which occupy the west wing—abut on a corridor at the end of hall, giving independent access for the pupils. The dining-hall, lighted by windows facing the hotel, is situated at the north end of the eastern block, approached by a similar corridor. In the first-floor arrangement the class-rooms abut on the main corridors, the stairs are well placed at the angles, while a balcony is obtained overlooking the hall and entrances to two end galleries. The domestic arrangements are confined to the rear part of the east block; there is a sufficient space for light between it and the hotel, and covered playgrounds are obtained. The elevation is roughly drawn, and the detail is meagrely shown; a plainer rusticated elevation is sent in, and a large ink perspective. "Move" is superior as an architectural set of drawings to either of the above. Domestic Gothic in design, of brick and stone, it is clever in the detail, but less pleasing in its grouping of the front. The dining-hall forms the centre of the Embankment elevation, rather high-shouldered in effect; the entrance-tower at south-east angle, with its roof and turrets, is objectionably near the hotel; and heavily crowned; the oriel windows are not pleasing, but those defects are counterbalanced by a well-marked hall in the west return, its gable end having a large window. Referring to the ground-plan, we remark a quadrangular arrangement, the great hall in centre lighted by three areas on each side and well provided with entrances all round; the class-rooms on the north and west sides are convenient, with lobbies and cloak-rooms in front, and the corridors giving access to them have been arranged with some regard to every-day requirements. Top lights are shown over the drawing-class rooms. The upper plan shows the lecture-room in the centre of the façade, the laboratory being on the west and the porter's room on the east side. One good feature is that the class-rooms are mainly located in a 2-storied block on the north side, though we do not like the position of the natural science section. The covered playground extends under the principal story, which is carried by piers and arches. All these designs are well balanced in parts, compact in their general classification, and evidence considerable skill in working out the conditions, though they rather lack the architectural merit worthy of the object. Under the motto "Practical" we notice a design of much merit in plan, the authorship of which cannot be mistaken. The central hall idea has been worked out with side-blocks and class-rooms, and a continuous corridor. The hall is 118ft. by 50ft. The boys' entrances are well placed for easy ingress to and egress from the hall, and the cubical contents of each room is worked out at 6,380ft. On the first-floor the west and south blocks only are carried up, the east being covered by a flat; the class-rooms are generally well lighted and ventilated, and the author has furnished a scheme of warming and ventilation on Price's system, several outline plans being shown indicating the fresh and warm air flues. Objection must be taken to some details, especially the position of kitchen offices. A large playground is obtained under the buildings, and a good area at the side of hotel. In the external design a free Renaissance has been adopted, circular-cornered windows with gables and dormers relieving the front. We do not like the raised roof over lecture-hall, but the perspective is a masterly line-drawing. Estimated cost is £55,925. Another set of drawings bears the motto "Practical." The author proposes placing the hall—which is a long one—on the east side, treating it externally as a separate gabled building. The main front has a centre tower, connected by a low building between. A roofed gymnasium forms the centre, and a covered playground is obtained under hall. The general distribution of the plan places the class-rooms on the western side, and we have already described the main features. The design is Gothic, and the coloured perspective is more satisfactory than the elevations. "Our Boys" is planned on the centre open quadrangle principle, with the hall on the north side, and the class-rooms laterally arranged and under supervision. A rather scratchy ink perspective shows a Late Gothic treatment, with a south-west angle tower and lantern supported by flying buttresses. "La Vie Durante" has a central hall lighted from the top, with class-rooms grouped round it, entered by lobbies, between cloak-rooms. There is a gallery round hall. The plan has some amount of originality, but there is hardly enough space at the side of hotel, and the parallel wall on this side is undesirable. The elevations are designed in a cold Classic with a centre portico and dome over. "Plan" is vigorously drawn in an ink perspective, in a Renaissance style; central hall on first-floor, but the arrangement of entrance and head-master's block is wasteful. There is some good detail. "Concentration" we have already referred to: the plan has much to commend it, and the elevation, Renaissance in style, is conceived with some fredom; the hall is made a central one. "Blackfriars" also has been described, the chief peculiarity of this design being the semicircular hall with radiating class-rooms; but the author sends an alternative design, showing a rectangular arrangement, the hall being placed east and west, the class-rooms being in the east, west and south sides. Considerable skill is shown in the plans. "Experientia" is one of those who make the great hall a front feature. There is an open centre quadrangle, and the class-rooms, &c., are grouped round on the three sides. Late Gothic has been attempted with a tower at west angle. "Quis" we have before mentioned as a carefully planned arrangement. The hall is made the central apartment, and four blocks of class-rooms are shown at the corners, making a well-balanced disposition with good lighting and corridors. A covered playground is got under the central hall. Another plan shows a transverse position of hall, which is smaller, and two open areas on the south of it, with a gallery approach to hall, and with surrounding corridors. Both plans show ingenuity, and the departments are well separated on the whole. The drawings are carefully prepared; the style is a freely treated Renaissance, with rather florid overloaded ornament in the dormers, and perfectly plain below. "Facta Non Verba" adopts also the centre hall, the class-rooms being disposed on each side in four blocks. The plan is not meritless, and we also think the elevation suitable as a Late Gothic adaptation, collegiate in character with a centre tower entrance. "Practical" (No. 3) is Gothic: the hall is turned east and west and placed behind a centre quadrangle, while the class-rooms are ranged along the west side. The arrangement has some good points in it. "Lux" is another design not without merit in style, with a centre hall; "Crux," an unfortunately metallic-looking Gothic design, is on a cruciform plan. "A1" is at least an original conception; it looks more like a large factory than a school, a series of closely-set round-arched windows filling up the elevation which has a campanile. There is a square hall centrally placed. "Non Nobis Domine" adopts the central hall and side class-room arrangement; the former is lighted by a series of side areas; the Gothic style has been chosen, and the detail is above the average, a large drawing of tower being sent in. Of course, there are as usual *replicas* of the National Gallery, Post Office, Chelsea Hospital, and other lions of London architecture, and we have in this category many remarkable and palatial-looking designs. "Royal Academy" adopts the centre hall, and has the usual class-room arrangement, but there is waste of space in areas; Roman is chosen, three domes and a centre portico face the Embankment, the order being Corinthian. The author has tried his best at least to make an impression, if we may judge by the coloured perspective." "As the twig is bent, &c.," is a carefully prepared set of plans, but is wasteful in vestibule, and the class-rooms on the west side form an irregular and awkward range. The design is thorough Renaissance of the School Board type, with a tower at south-west angle.

A few other remarkable designs call for a passing word. Among them we notice—"North Lights," a French Gothic set of buildings, with a hall of a very elaborated type on the east side, and class-rooms disposed in centre with areas between; there is little space left near the hotel. "Domine Dirige Nos," with sword, is a conspicuous brown ink florid Gothic elevation, with centre hall and tower. "Compactness" places hall in front; there is a central staircase, with side areas; the class-rooms are placed in pairs, opening from corridors on the north, east, and west. The plan is well balanced. "Light and Air" is another clever design shown in Classicised elevations, though the departments are somewhat disjointed. "An Old Scholar" in Late florid Gothic, with centre hall lighted by open side courts, and having lobby entrances with class-rooms mainly on west side; the Indian ink-shaded perspective and details exhibit much care and labour. "Central Hall," "Veritas," "Gamaliel," "Quadrangle," "Perseverantia Omnia Vincit," "Y. Z.," "Q. E. D.," "Sunshine," "Thorough," "John Carpenter, Founder," "Intersecting Triangles," and a few others we must revert to next week, when we shall be prepared to enter more critically into the merits of some of the designs. We may observe, however, of the plans as a whole, regarding the requirements of the conditions as sketched out above, that the design placed first maintains fairly the position it occupies, notwithstanding some obvious defects in its details. In making their selection, the committee have, we understand, pursued a methodical process of investigation, suggested, we believe, by the secretary, by which every member was supplied with a ruled note-book in which the several points of the conditions were abstracted in each page, thus enabling each of the committee to make his own observations. A summary of these notes was handed in, and those competitors who had failed to comply with the largest number of conditions were step by step eliminated. In competent hands such a mode of examination might be of value, but only by those capable of analysing technical drawings can such a procedure be used successfully.

THE KILBURN SHOW.

[Second Notice.]

In spite of the weather, the Show at Kilburn which has just closed will bring about some good results. It will prove how much agriculture has profited by mechanical contrivances; how closely the interests of the husbandman and engineer are bound up together, and how much more prosperous the British farmer will become when he is relieved from that overwhelming incubus which at present oppresses him, the "burden of the landowners." If anyone has any doubt about the present anomalous state of agriculture in this country, he should this week have visited the two large sheds on each side of the cross avenue at Kilburn, set apart for the exhibition of ancient and modern farming implements, and compared the modern with the older forms of instruments used for husbandry. He would have found overwhelming evidence of how little has been done towards improving the practice of agriculture in some parts of the country compared with the rapid advances made elsewhere in mechanical appliances, which the recent exhibition has demonstrated. Exactly the same is to be said with regard to agricultural buildings. The expenditure on their improvement and construction has been miserably below what it ought to have been, considering the landlords' gain from the improved rentals.

Interesting, however, as the subject is, we cannot pursue it further in these pages, but must hasten on to complete our notes, commenced last week, of some of the more prominent standings at Kilburn. We may first, however, take the opportunity of inquiring who was responsible for the great want of method in the arrangements. An agriculturist was sure to find in every part of the grounds stands of much interest to him, but those engaged in the varied building industries must have felt the need of a more methodical plan. In looking for the departments assigned to building materials, inventions, and appliances, the visitor had to walk through the chief avenues before he could find what he wanted; thus the thoroughfares on the north side, mainly devoted to these exhibits, were by no means representative of them. Instead of confining one avenue or part of an avenue to building appliances, the stands were promiscuously placed with others devoted to agricultural implements, and it was very difficult, even with the catalogue in hand, to utilise one's time to the best advantage. Brick and tile-making machines, as we said last week, occupied an important position, and several machines of great merit drew our attention. Craven's patent brick-making machine is a clever adaptation of machinery to the purpose. The bricks are produced hard enough by it to go direct to the kilns without drying-shed labour. The machine we observed in action is a rather complex-looking though really effective contrivance. The clay and water are well pugged, and the moulding is performed on a circular revolving table, after which each brick is mechanically charged into a powerful press, by which process the escape of any confined air takes place, and the clay is compressed to the greatest density. The labour of a boy only is required to remove the bricks from the press; and the machine worked by 8 to 10 horse-power will, it is said, deliver 16 to 18 bricks per minute. Messrs. Bradley and Craven, of Wakefield, are the manufacturers. Another machine of a portable kind deserves notice. It can be worked by a lever by hand-power, and is intended for pressing or finishing partly-dried bricks or small tiles, previously moulded by hand. The machine is very simple and can, by the addition of certain moulding pistons, make moulded bricks, arch bricks, tiles, &c. It is fixed to two small wheels and can be moved like a small hand-barrow. A man and boy can press, it is stated, 5,000 bricks per day, and the price is £18. Messrs. Clayton, Howlett, and Venables, of Harrow-road, London, are the makers. We also noticed the same firm's brick making machines, called the "Three" and "Two Process." In the "Three-process machine" crushing, pugging, and moulding are performed at the same time, and are adopted for all plastic clays and marls. By the addition of suitable dies, perforated and moulded bricks of any form, pipes, &c , can be made. The brick-cutting table, and the tubular brick, tile, and pipe machine, on the continuous feed principle, are very simple and economic in action; 6,000 to 8,000 pipes, &c., may be turned out per day. The screw press for roofing-tiles is also ingenious and effective in pressure, the latter being given by a horizontal fly-wheel. As we observed in our last notice, concrete constructions have not been so fairly represented as their merits deserve. A very simple though not altogether new "hollow flooring," introduced by Mr. G. E. Pritchett, F.S.A., architect, of Bishop Stortford, calls for mention. It consists mainly of common agricultural pipes laid over the surface to be paved, and then cemented or asphalted over. A similar combination of earthenware pipes and concrete filling-in has been patented by the author for walls, which may be faced with rubble or terra-cotta, and specimens of it were to be seen at the exhibition. For walls the pipes are packed close together vertically with vertical bonded or webbed pipes, and filled in with concrete between. Pieces of hoop-iron may be used as ties. These cellular walls and floors may be made useful for ventilation and warming; heated air may be admitted through them from the basement, or they may be used as outlets, and various applications of the tubular wall are shown by the inventor. For filling floors between iron joists, and for packing round iron girders to prevent the action of fire upon them, and for other purposes that may suggest themselves, Mr. Pritchett's introduction of pipes and concrete is simple and inexpensive. Hollow ware has been used for construction of many roofs and domes, but common pipes can always be obtained.

Another constructive appliance is exhibited by Western and Co., engineers, of Lambeth. It is called "Hamilton's patent prismoidal reflecting lens pavement light," for directing daylight into basements, &c. The general principle is well known to our readers, but the peculiar feature of this pavement light is that the lenses are prismoidal and convex alternately arranged, the former dispersing the rays laterally in all directions, the latter intensifying the light vertically. A clever contrivance we saw in action was a method for opening the lights by an equilibrium arrangement, which can be adjusted to any of them. The lights are made to fit into a grooved-bar or frame. The prices of the lights are from 7s. 6d. to 13s. 6d. per foot super., and they have been much used in the City.

As regards horticultural buildings, if the Show has not produced anything novel it has at least shown great improvements in structural adaptation and ventilation. Conservatories and greenhouses have till very lately been tasteless, and not very economical in their modes of ventilation and glazing. The exhibits of Messrs. T. H. P. Dennis and Co. and Messrs. Cranston and Luck, together with Rendle's patent system of glazing, are suggestive of decided improvements in construction, and leave little more to be desired by the architect. Messrs. Dennis and Co. have, besides their ornamental garden structures, introduced various fittings that commend themselves to the profession. Their patent door-handle, already mentioned by us, is an excellent substitute for the usual clumsy furniture, and may be fitted to any door. It consists of a square spindle of iron, with screw ends, by which means it can easily be made to fit the thickness of any door. The knobs are cast hollow, and the outer half of each can be unscrewed. When it is desired to remove the furniture the half of knob is unscrewed, the nut fitted to the screw part of spindle and at the base of knob is taken off, and the spindle can be withdrawn. In fixing, the spindle is first passed through the door, the knobs are passed over the ends, the inner nuts are screwed on and adjusted to give sufficient play; the screws for securing the nuts may then be put in, and the outer halves of the knobs screwed to the fixed portions, when the furniture is complete. It will be observed that the excessive length of spindle when applied to a thin door passes through and fills the cavities of the knobs. The water-waste preventer exhibited by this firm is also very simple in its action: it comprises two chambers, into one of which the water is admitted by a ball valve. A small hole in the plate between the chambers allows the water to run and fill the second compartment until the height is the same in each. When a flush is required a chain is pulled which actuates a lever, whereby the water is forced by means of a plunger round the head of a siphon, which empties the second chamber, which is sufficient for one flush. The refilling proceeds as before, the aperture being made small enough to allow the water to take three minutes before another flush can take place.

Rustic woodwork for aviaries, garden-seats, summer-houses, &c., make up a large class of exhibits at Kilburn. The stands of several exhibitors show a varied assortment of these fanciful erections, many of moderate design and others strangely grotesque. Portable garden structures of all kinds may be seen, and we noted a variety of garden frames of great simplicity of construction, among them Horley's patent structures, the special feature in which is that no sash bars and putty are necessary, and the whole of the framework can be put together in a few minutes by iron screws in the manner of a bedstead. Straight and curvilinear roofs are made in the same manner, the squares of glass (21oz.) are run into grooves at the top, and rest in a bottom rebate, the panes being secured by iron buttons. A house 8ft. by 6ft., and 4ft. 7in. to the plate, costs £10 complete, including packing; and greenhouses of the span-roof sort are made at from 18s. per foot lineal. Several iron ranges of considerable merit drew our attention. We notice particularly the "Eagle Range," manufactured by the "Eagle Range Company," Birmingham, a capital arrangement, with an adjustable bottom grate to alter the size of the fire, which may be open or close, and with top and bottom flues for heating oven, &c. It has a good hot-plate, the oven can be heated in any part desired; but not the least merit of the range is that it is provided with iron flues, thereby saving the continual work of the bricklayer. Another good range we saw in operation was the "Thorncliffe Range," made by Newton, Chambers, and Co., of the Thorncliffe Ironworks, Sheffield. This range is economical, the fire-opening is small, with iron ovens above—just below the mantel-piece—and convenient for inspection, and the fittings and workmanship are excellent.

Since our last issue, the judges appointed to report upon the plans for farm buildings have made their award. Strange to say, no design of any of the classes has been thought worthy of a prize of £50; notwithstanding in each class several have been selected worthy of commendation, and one in the 3rd class honoured as worthy of "high commendation." If the labours of the competitors were to be so slightly valued, the competition must have been merely a "draw." The judges' report is as follows:—

> We have carefully examined the sixty-eight sets of plans submitted in competition in four classes for the prizes offered by the Society, and have to state that, although as a whole they display much architectural power, and in many instances considerable practical knowledge of farming requirements, there are none that combine superior arrangement of details with that economy of cost which is essential.
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> We therefore abstain from awarding a prize in either class, but select as worthy of commendation:—
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> (Arable Farms above 300 acres.)—In Class I.—"Colonicus," Mr. Richard Waite, Duffield, Derby; "Practice with Economy," Mr. A. W. Clarke, Simdorne, Shrewsbury; "Utility," Mr. W. J. Moscrop, jun., Stockton-on-Tees; "Experientia," Mr. J. E. Watson, F.R.I.B.A., Newcastle-on-Tyne.
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> (Arable farms under 300 acres.)—In Class II.—"The Eye of the Master is necessary, &c.," C. and J. Cadle, Gloucester; "Per Mare, Per Terram," F. E. Walker, Scole, Norfolk; and as worthy of high commendation, the design "Cheddar," (W. A. Keates, Hanley, Stafford); in Class III. (Dairy Farm over 300 acres) which exhibits excellent features in arrangements necessary for a large sized dairy farm.
>
> HALIFAX WYATT.
> (Signed) THOMAS SAMPLE.
> J. BAILEY DENTON.

Now, it is hardly conceivable that out of sixty-eight sets of plans, many by men practically acquainted with farm-buildings, not one has been worthy of a £50 prize, and we are much mistaken if the competitors will readily acquiesce in receiving as an adequate reward for their labour this mere acknowledgment of merit. Taking the plans in the order given in the report, "Colonicus" is a cleverly worked-out design, the author of which sends in a well-drawn coloured perspective. The yards and stalls are covered by a series of parallel roofs, and the distribution of the apartments is well managed. The estimate is £2,686. "Practical with Economy," by Mr. A. W. Clarke, of Shrewsbury, shows a farm of 400 acres. The drawings are carefully prepared. There are four covered yards, allowing 162ft. superficial to each beast. The blocks or sheds form a parallelogram, and inclose the yards, a roadway surrounding the south, east, and west sides. A double range of feeding-stalls occupies the centre. Drainage and ventilation have been considered, and the sections and details display a technical knowledge of the requirements. The buildings are unpretending, but suitable in character. "Utility" is a simple treatment: a long centre gangway, with feeding boxes arranged transversely in parallel rows, inclose open and covered yards. The straw-house, threshing, chaff and root-cutting rooms are on the east side, and the cart-horse stables on the west side. The yards on the north side are covered, those south of gangway open. Mr. Moscrop, of Stockton-on-Tees, is the author. "Experientia," by Mr. J. E. Watson, F.R I.B.A., Newcastle-on-Tyne, sends in a well-considered plan, but the elevations are somewhat meagre. Covered yards are adopted. In Class II. (arable farms not exceeding 300 acres) a very able plan has been awarded a "commendation." The "Eye of the Master is necessary, &c.," by Messrs. C. and J. Cadle, of Gloucester, is ⊓⊓ shaped; the sheds for young stock are placed along the north side and inclose four-fold yards for young cattle, which may be covered if necessary; the implements and roots sheds are on the west side. Cost estimated at £1,177. There is no attempt made in the elevation. "Per Mare per Terram," by Mr. F. S. Walker, of Scole, near Diss, incloses a covered yard 81ft. square within a quadrangular arrangement; the feeding-stalls and food-preparing rooms are in one range on the north side; the yards are covered and sheltered on the west and east by the piggeries and stables. In Class III., "Cheddar," by Mr. W. A. Keates, of Hanley, Staffordshire, is highly recommended. The plan is certainly an admirable one for a dairy farm of 400 acres. The cattle stalls are placed in immediate communication with a central feeding passage and tramway from the food-preparing shed, and these and the stables and cattle-boxes inclose two covered yards, each with a dung shed and tank underneath. The cow-houses are central, and afford tying for 112 milch cows, with provision for calves on south side. The houses are double, iron hay-racks are provided, and water is laid on to each stall; these have wood divisions, as preferable to iron, and can be removing for cleaning. The straw barn is also placed centrally, and adjoins the food-preparing house; while the dairy is on the opposite side of road, attached to the house, the tramway giving easy access to it. Marden's interlocking glazed tiles are specified for the wall linings. The arrangements are complete, and agree very closely with a plan we published some time ago by Mr. Potter. The drawings are well-prepared, and we think the author has a fair claim to expect some more tangible expression of the merit he has won. We must express surprise that the design "Invicta," by Mr. E. E. Cronk, of Hanover-square; "Ingenuas didicisse fideliter, &c.," by Mr. Bowes A. Paice, A.R.I.B.A.; "Sero sed Serie," and one or two others we noticed last week have not received any recognition of merit for the architectural skill displayed in the arrangement and treatment of the buildings, and we cannot but think the decision in this respect is unsatisfactory, and affords conclusive evidence that the gentlemen selected for the task of awarding the prizes should have had at least one architect amongst them.

COTTAGES, AND HOW TO ARRANGE THEM.*

A MANIA for sanitary improvements seems to have gained possession of a large number of well-intentioned people, who are evidently of opinion that by unburdening their minds they are both relieving themselves and doing other folks some good. There has been of late an embarrassing number of pamphlets and treatises upon the subject of sanitary construction, tending rather to perplex the reader than to give him in a concentrated form the results of recent inquiries. "A Sanitary Reformer" has just published a small and neatly got-up octavo volume purporting to give "all the important points to be considered when healthy, and at the same time convenient and comfortable, structures are desired." The compiler first treats of the plan or internal arrangements of the cottage, from the simplest rural structure to the villa-cottage. In the first place, we could have wished the chapters had been more concisely written; for the "compiler" is unnecessarily prolix in classifying cottages, and then treating on their defects. Beginning with the one-roomed cottage, some very trite maxims are introduced which scarcely needed reiteration. One of these is that there should be a place for everything, and the suggestion is made that there ought to be ample cupboard or pantry accommodation. The author proposes to "box-off" a part of the room, or, in short, make a cupboard, or otherwise to fix shelves on each side of the fireplace-jambs, with doors below, and forming sideboards above. One recess may be shelved up to a certain height and be made to form a wardrobe. These are certainly desirable additions to any cottage worthy of the name. Another hint is, that a washing-place should be provided, and that a porch should be added. The plans showing these arrangements are given isometrically, and this is the best feature of the book, rendering the plans intelligible to those who cannot understand plans. Our author proposes to get a porch, a scullery, and a pantry by cutting off one side of the room, making them internal apartments, with separate doors from the living-room. By a similar process of internal partitioning-off, the author arrives at a plan in which the original one-room type, comfortless as it is, can be changed into a comfortable cottage with two additional bed-rooms, and, as he observes, it would be easy to "ring the changes," and give a variety of plans upon this principle of internal division, keeping the outer walls as compact and simple as possible, so that the roof may become an easy matter. Plates 1, 2, and 3 furnish a few types of single-storied cottages of a rectangular form, suitable for a married couple without children, but we note the absence of a back-door from the scullery in all these arrangements. The internal porch and pantry are formed by a partition on one side of the living-room, obviously the least expensive mode, and one more effective than the box-like addition generally seen. From single-storied the author proceeds to show two-storied cottages, and detached cottages with two bed-rooms. Of the plans for pairs we cannot speak favourably of those on plate 5: the internal passages between parlour and back offices are unlighted—a most undesirable condition for the labourer's cottage, besides being expensive, the larders are without ventilation, and apparently quite dark, and the w.c.'s undesirably placed within the house. If the plans on plates 5 and 6 are to be taken as models, they contravene the advice given in the earlier pages, for more costly and ill-advised plans we have seldom seen. In cottages and small houses, passages should be reduced to a minimum, and there cannot be any objection, in a cottage, to pass from a living-room directly into the kitchen. In these plans no attempt is made to economise internal walling. Some better examples given are plans designed by Mr. Strickland, published in his Report on Cottage and Farm Building Plans for the Yorkshire Agricultural Society. Speaking of the dimensions of rooms, a few remarks are made in which we concur. Nothing is so unpleasant or so prejudicial to comfort as the feeling of being cramped, and the author truly says, a few inches more in the floor space of a room is just the difference between one which is pleasant and the reverse. "Many mistakes," says the author, "as to dimensions arise really from an inaccurate knowledge of what effect a certain number of inches will have when added to or taken from the floor of a room or the width of a passage, or a staircase or a closet." It is very true that some artificers show a want of appreciation of a few inches; they seem to prefer whole numbers in feet to fractions, not thinking what 2in. or 3in. thrown into a room will do for it. Passages are often spoilt by an inch or two reduction of width, and we could bring many instances to prove that the addition of an inch or an inch and a half to the width of a staircase would make all the difference betwixt ease and comfort and their opposites. We commend the remarks on these matters to builders of small houses. We believe also that the size of rooms has an influence upon the mind of those who dwell in them, and that cramped and low rooms are prejudicial both sanitarily and morally. Our author thinks the minimum for a living-room of a cottage should be 14ft. by 12ft., and when we consider that several people have to inhabit and work in this room for a considerable portion of their lives, it is not too large, though living-rooms seldom exceed 10ft. or 12ft. square. No doubt, a few well-considered fittings and a fall-down table at the window will add greatly to the comfort of a small living-room; and the fireplace jambs should always be considered in determining the size of a room, in fact, the dimensions, we think, would be more fairly taken from the face of jambs instead as usually from the recesses. For a scullery 9ft. by 7ft. is thought sufficient, and we agree that it should not be made larger than its legitimate work requires it to be. Windows of uniform size are the most economical in saving material and temper as regards fittings and blinds, though not always the most artistic. Chapters IV. and V. deal with "cottage villas," as they are called, the choice of site and soil; some useful hints will be found, that would have been all the more useful if they had not been buried in the verbiage the author delights to indulge in. One of the hints thrown out might be carefully laid to heart by the would-be builder of fashionable villas, namely, that it is more sensible to have fewer and comfortable entertaining rooms than many small ones. The plans of cottage villas given do not exhibit the careful arrangement we might have expected to find. Turning to the single-storied plan, plate 25, we find in one case a porch and inner lobby or passage with front access to cellar, very cramped and ill-arranged; the scullery has no outlet. Plan plate 27 is wasteful in the walls; the parlour and kitchen are in opposite corners, too distant for convenience. Plan on plate 28 is a trifle better. The ground-plan, plate 30, shows the same want of easy access between the kitchen and dining-room; the scullery has no outer door, and as in all other instances, everything would have to be taken out through the front lobby, even the ashes! But we cannot afford more space to criticise details; it is very evident the plans need revision, and in some cases they are quite impracticable; here and there the staircases are shown without light, and in only one or two instances do we find back-doors provided, as in plate 22. The passages to cottages, plates 15 and 16, and the ill-lighted staircases, are objectionable features, and do not come up to our idea of economic or sanitary dwellings. A chapter on ventilation is given in which the author appears to adopt the approved plan of ventilating-pipes outside the house. Another chapter treats of the supply of fresh air, in which flued walls for the admission of warmed air from the basement are suggested, or the simpler one of warming the entrance-hall and allowing the air to pass up to all the apartments. Heating by gas in an open fire-place by the medium of a Bunsen burner is mentioned.

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* Cottages: How to Arrange and Build Them. By A SANITARY REFORMER. London: Bemrose and Sons, Paternoster-buildings.

Turning to the designs or elevations, the less we say of them the better, and it is to be regretted the author did not confine the work to a few good plans. The elevations might have done fifty years ago; but they adopt an affected and costly style of ornamentation which is not in keeping with the pretensions of the work. Our author speaks here and there of broken outlines and "offsets," as he calls them, but there is no need for breaks in cottage dwellings, and the models furnished in the elevations printed on the cover, and on plates 9 and 24, are expensive, not to say unsuitable for cottages. The chapter on cottage adornments would have been better omitted. Window-valances and decorative fittings are certainly out of place in a cottage, and we are surprised a "Sanitary Reformer" should have so far overlooked the principles he started with as to have suggested some of the fittings engraved in his book.

ST. ALBAN'S ABBEY.

THE members of St. Paul's Ecclesiological Society visited St. Alban's Abbey on Saturday afternoon, and were conducted over it by Mr. G. Gilbert Scott, M.A., F.S.A., who indicated as many of the principal features of interest in the edifice as was possible during a two hours' perambulation. Beginning with the Roman invasion of Britain, and standing beneath the central tower of the abbey, Mr. Scott mentioned that the town of Verulam on the opposite bank of the little river Ver, now the Mure, was a place of some importance at that period, and was by them made a municipality. It thrived under their rule; twenty years afterwards was taken and sacked by Boadicea. Then Verulam was a busy little town, while opposite it was a wooded hill called Holmehurst. Now the positions were exactly reversed, for Verulam was now itself a hill covered with trees, having a few traces of ruined walls, and St. Alban's had risen to importance. The cause of the change was an event which must have seemed very small to those who witnessed it. Diocletian's edict against the Christians was put in force by Asclepiodotus, who restored Roman dominion, and in the 4th century A.D. a priest named Alban was put to death while protecting one Amphibalus. Gildas and Bede both say that in the place of the church under Constantine a church "of admirable workmanship and worthy of such a martyrdom" was erected, at which, Bede adds, "there ceases not to this day (730) the cure of sick persons and the frequent working of wonders." A reference was made to it at the Council of Worms held in 429. The church was ruined by pagan Saxons, when the relics of Alban were buried, but after their conversion the church was restored, as was evident from Bede's words, but the relics remained underground. In 793, Offa II., King of the Mercians, founded a Benedictine monastery—but not a church, as was generally asserted. According to Matthew Paris, Offa merely repaired the small church, "ecclesiolæ," and solemnly translated into it the relics of St. Alban with those added by St. Germains. Thus St. Alban's was parallel to Canterbury—erected originally by the labour of Roman believers, razed by the Saxons and restored by the missionaries from Rome. The town grew, and Ulric, the 6th abbot, founded the three existing churches of St. Peter, St. Michael, and St. Stephen, and established a market. The only remains of the church repaired by Offa, or, indeed, earlier than the Conquest, were the balusters in the south triforia of transepts; they were alternately banded and plain, and evidently fitted into their present positions with some awkwardness. The difference between the tooling of these shafts and the caps and bases in which they were set was remarkable. He suggested that they might have been taken from the old cloister to be used in this Late Norman work. The 14th abbot, Paul, came from St. Stephen's monastery, Caen, from whence his relative, Lanfranc, proceeded to Canterbury. Each commenced a new church; but while the latter was content to reproduce St. Stephen's, of which he had been abbot, the monk Paul far exceeded it at St. Alban's. In place of a nave of nine bays, transepts of two bays, and a chapel, as at Caen, at St. Alban's Paul commenced a nave of 13 bays, transepts of three bays, and two chapels; his choir had four bays instead of two, and the towers were to be beyond the aisles, as at Wells and Rouen, in lieu of being in line with them. St. Stephen's was 300ft. long by 140ft. across transepts, while St. Alban's was 465ft. by 210ft., and had a west front of 155ft. against 88ft. at Caen. The whole church was doubtless plastered within and without, and whitewashed. Paul painted the apse-vault, and no doubt the whole of the interior, as had been done at Peterborough and Hildersheim, and in the old basilicas. The aisle walls were some 8ft. or 9ft. higher than at present, leaving an ample triforium beneath the painted roof, and were vaulted in stone. He believed the nave was then of the full present length of 13 bays. The new church was consecrated on Innocents' Day, 1115, when Henry I. and

Matilda were present. Soon afterwards the slype passage leading to the cloisters at the end of the south transept was constructed, and those who went into it would find it a very rich specimen of Late Norman work. It was not, however, a passage to the cemetery, as had been averred, but led to the stairs of dormitory over the cloisters, and originally did not communicate with the transept. Having conducted the party to the western end of nave, Mr. Scott continued that the first alterations after the slype were to this portion of the nave, by the 21st abbot, John de Cella — so named from the cell of Wallingford, of which he was prior—between 1195 and 1214. He determined to pull down the west end of the church and rebuild on a magnificent scale; but although he was a man of grand ideas, he was not a man of business. He demolished the west front and towers, and, Mr. Scott believed, finished the west portals as we see them, although this was much disputed, but he only succeeded in raising the rest of the work to the height of the masons' sheds. Hugh Goldcliff, his mason or architect, is described as "a man deceitful and false, but an excellent workman." His second architect, Gilbert d'Eversholt, a monk, designed the portals just referred to, which would compare favourably with the west porch at Ely and St. Hugh's choir at Lincoln, while the front had far nobler entrances than that of Wells, which it would somewhat have resembled. By this time the money was all spent, the frost had injured the work, and all efforts to obtain means to complete the undertaking were unsuccessful. The members having entered the portals, now concealed from the exterior by hoarding preparatory to restoration, Mr. Scott pointed out how William de Trumpington, the 22nd abbot, carried forward the work, cutting down details to suit his purse. Thus on the internal west wall, although the bases between the north and central portals may be seen prepared for five marble shafts, the caps are designed for but three, and mouldings are omitted without scruple in his continuations. Trumpington completed five bays on the south, and four bays on the north side. He roofed-in the west portion of the nave with leaded oak roof and a flat ceiling, according to Matthew Paris. Since both roof and ceiling were mentioned by Paris, there appeared documentary evidence for a distinct and therefore high-pitched roof, such as the one now in course of erection. The walls of Trumpington were 4ft. higher than those of the Normans, and probably, therefore, he continued the roof at higher level up to tower. If this main roof was not made continuous over the whole of the Norman work, how could Eversden, the next great builder, have raised one side of roof without touching the other, when he re-erected a part which had fallen? The theory is more probable, since Trumpington is said to have re-roofed the transepts, which are the same higher level; the flat ceiling of the south transept is specially mentioned. He took down the old roof of tower and erected a much more lofty one. A spire seemed to be implied by the statement, and this might have been the one removed in comparatively modern times, "on account of its being considered out of character with the architecture of the church." Trumpington Church has such a spire, which probably existed in this abbot's days. Matthew Paris, who described these works, became a monk here in 1217 and died 1259. The aisle walls at the western end of the abbey remain unpierced with windows to this day, as on the north side stood the Church of St. Andrew, founded about 1151-66, and rebuilt in 1450, a church of four bays opening into north aisle; and on the south was the abbot's house. Passing to the east side of the temporary screen in the nave, Mr. Scott said, this was the scene, on June 22nd, 1323, of a great catastrophe. After the mass of the Blessed Virgin, as Walsingham tells us, when the church was crowded with men and women, "on a sudden two immense columns on the south side, as if broken off at their foundation, fell one after the other, with a terrible crash and ruin, to the ground, and scarcely an hour had passed when the entire wooden roof built above these columns, with its arched beams, and the adjoining portion of the south aisle as well as nearly the whole of the northern cloister, fell likewise to the earth." Hugh de Eversden, then the abbot, commenced to rebuild, and it was finished by his successor Abbot Wallingford, ten years later. The result members could see in a work of unusual richness and beauty, the ball-flower being freely employed to give greater effect. It seemed that Wallingford, who had been a blacksmith, did not press forward the work of rebuilding, but devoted his time to the construction of an astronomical clock. The monks complained to King Edward III., who declined to admonish the abbot, remarking that anyone could build, but not every man could make an astronomical clock. In corbels in the spandrels of the southern arches might be seen the heads of Edward III., Queen Philippa, the arms were those of Mercia, of the Confessor, and of England. On the pillars, more distinctly on the north side of nave, might be seen fresco paintings commonly called the Stations of the Cross, but which he considered simply the reredoses of altars; each depicted some phases of the Crucifixion, and they appeared to range in date from the end of twelfth to the fourteenth century. Advancing eastwards, the lecturer said the screen before the members was that of St. Cuthbert. It was sometimes called the rood screen, but the actual jube was one bay eastward, as could easily be detected by the indentations and holes in the next pier on either side. On the second pier on the south side could be seen three marks left by the iron screen which once inclosed these two bays of nave. The choir formerly comprised the space from this screen to the eastern piers of the great tower, and the presbytery doors were therefore placed unusually far east—in the front bay of presbytery. The foundations of the ancient stalls existed under the temporary ones before the visitors, and corresponded exactly, except that they now stopped on the west side of the great tower arches. Edward II., in 1314, gave timber for this, and they were executed by one Martin Geoffrey, a joiner, but were not completed till 1369. Abbot Wheathampstead, in the middle of the 14th century, presented the church with an organ, covered at high mass with an arras cloth, and made a wooden lectern for part of the choir and for reading the gospel. The ceiling over these three eastern bays of nave was a few years since cleansed from the comparatively modern painting, when beneath it was found a most interesting series of painted panels. These have been temporarily stowed away for preservation during the restoration of the roof, but a photograph had been taken of them, which Mr. Scott exhibited and explained. The ceiling was divided into thirty-three panels, three of these occupying the width of nave; the panels each contained clauses of the Te Deum, interrupted, however, in the centre by figures of our Lord and the Virgin Mary, evidently later insertions. The central portions of the panels were occupied by shields containing the symbols of saints and virtues, and the arms of the principal countries and of the members of Edward III.'s family. The latter fixed the date of the ceiling as between 1368 and 1385, but there was some little difficulty owing to alterations during progress, as Edmund of Langley was called Duke of York, a title he did not assume till 1385, while Thomas of Woodstock was not called by the title of Earl of Buckingham, created 1377. In the south transept, Mr. Scott said that some years since, when this tower gave symptoms of failure the piers were examined and underpinned. Under the south-east one was found a large excavation into which battens of oak had been wedged. It was supposed that this undermining was done after the Reformation, with the intention of destroying the tower, but that the order was countermanded and the hole carelessly filled up, and the tower allowed to rest on these rotting timbers for three centuries. In the north transept, opposite where they stood, was the scene of Alban's martyrdom. Having referred to the slype, Mr. Scott conducted the members through the south aisles into the presbytery. Of the work of Paul de Caen, one Norman bay was still left, he showed, on north, and two on south, and one in aisle. This portion was rebuilt by John de Hertford about 1235-60, and completed by the next abbot, Roger de Norton, by whom a square east end was substituted for the old apse. The vault was painted as they saw it by John de Wheathampstead during the middle of the 15th century, and was one of the finest specimens of such work. The sumptuous and highly-decorated altar-piece before them was constructed by his successor, Wallingford; the wheatears upon it appeared to contradict the documentary history there, and point to an earlier date, but possibly Wheathampstead left money for the work. Mr. Chappell, the clerk of works, spoke of the arrangement of this altar-screen, and showed a highly-decorated truss of Late Renaissance type, and other post-Reformation alterations. The central crucifix, once of silver, had long since disappeared, and possibly existed in the chapel of the Knights of St. John of Jerusalem at Malta, where he had seen a similar one. Proceeding to the south aisle, Mr. Scott showed the highly carved tomb of Abbot Ramrydge, c. 1521, and the wooden watching-loft in the retrochoir, and passed on to the Lady chapel, commenced in 1260 by Abbot Hertford, who carried it as high as window-sills, and completed after a long interval by Hugh de Evesden. The alterations in design were pointed out, and also the changes made in the ante-chapel by succeeding abbots, who removed the columns by which it had been divided into 9 vaulted compartments, and covered it with wooden vault. The history of this Lady chapel as a grammar-school, and of the ante-chapel as a mere public passage, from north to south, and boys' playground, was described, and the recent works of repair and restoration were also alluded to. Attention was called to the reconstructed feretory of the shrine of St. Amphibalus, made by the sacrist, Ralph Whitchurch, at the close of the 14th century, long destroyed, but now partially rebuilt from the loose fragments. Returning to the retro-choir, where, having referred to the elaborate tomb of Duke Humphrey, built by Wheathampstead, Mr. Scott said he had now brought the members to the central point of interest in the abbey, the lower portion of the shrine of St. Alban. It was constructed by John de Marinis, 26th abbot, about 1308-2, and was adorned with gilding and colour and every symbol of honour. It was constructed of Purbeck marble and clunch, and was remarkably similar in detail to the tomb of Edmund Crouchback (died 1296), second son of Henry III., on north side of high altar at Westminster Abbey; after comparing these works he saw no reason to doubt the date of the work. The shrine was destroyed at the Reformation, but fortunately for us the fragments were built into the walls shutting off the ante-chapel, from whence they were recovered bit by bit a few years since. He thought no more fitting point could be selected for closing his description than in looking at this exquisite jewel of the Abbey of St. Alban's.

* * *

UTILISATION OF AN OLD HARBOUR.

THE utilisation of waste lands in Great Britain is one of the questions of the day, and *Engineering* quotes an example of what can be done in this direction by spirited private enterprise, which is being rewarded by capital results, the reclaiming of some 750 acres of land which once was a harbour on the Sussex coast. The first step taken was to make an embankment or sea wall, to get the soil drains into an open bed in the centre of the harbour, the outlet at which is controlled by a sluice which is automatically closed at high water. Next came the process of cultivation. This was first attempted with horses, but the soil of a great part of the reclaimed land is close and muddy, and one of the essentials of its successful culture is to loosen and lighten the top soil so as to admit the air and rays of the sun. Ploughing with horses did not satisfactorily effect this, because after ploughing and harrowing a shower of rain caused it to run together again. It was then decided to apply steam power to the work, and the result has been remarkably successful; lifting up and thoroughly loosening the soil to a depth of ten inches. The land thus treated keeps light, and does not run together again, and the condition of the corn sown on lands thus treated by steam power is remarkably superior to that on the same class of land worked by horse power. Of course from the soft muddy character of the soil, it would be impossible to travel engines over it, and benefiting by the experience of a somewhat similar operation carried out at Barth on the Welsh coast a few years ago, the proprietor resolved to adopt the same system as that adopted at Barth, namely, that of Howard. The engine is placed on a road which has been made alongside the reclaimed lands, the ropes being passed round the piece to be cultivated, two travelling anchors taking the place of two men. During the past season a large number of acres were ploughed and cultivated in this way, and at the present moment the corn sown there is fast ripening for the sickle.

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CHURCH AND PRESBYTERY OF OUR LADY HELP OF CHRISTIANS, AND ST. DENIS, MARYCHURCH.—ROMAN CATHOLIC CEMETERY CHAPEL, CLITHEROE.—WOODSIDE, CARLISLE.—ORGAN AT S. JOHN BAPTIST'S CHURCH, HALIFAX.—NEW PREMISES IN FARRINGDON-STREET.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ST. MARYCHURCH.

St. Marychurch is an old parish, and derives its name from its church of great antiquity, which has of late been rebuilt from the designs of Mr. Hugel. The illustration which we give this week is of buildings adjacent thereto, and comprises a church, presbytery, convent, and an orphanage, and is taken from a view now exhibiting at the Royal Academy Exhibition. St. Marychurch is a growing and populous suburb of Torquay. Some years ago, Mother Margaret Hallahan, the modern founder of the Third Order of St. Dominic in this country, having already established the communities of Stone, Stoke, Clifton, Bow, and others, determined to open a sanatorium for the many poor children she had compassionately succoured. Accordingly, having procured ground, to which further extensions have since been added, she proceeded to build an orphanage, using the old building as the convent. This, the nucleus, has been added to from time to time. In her efforts she was unexpectedly assisted by Mr. Chatto, who generously volunteered to build the church. The necessity of using the old buildings for the convent, however, prevented more than the construction of half the building. After the lapse of some time, it has been found possible to substitute new buildings for the old, and the completion is now being proceeded with from the designs of Messrs. Joseph A. Hansom and Son, of Broadway-chambers, Westminster, under whom all the buildings have been erected. The contractor is Mr. Edles, of St. Marychurch, and the clerk of works, Mr. Joseph Seed, who has supervised many important works under the architects, notably the church at Arundel for the Duke of Norfolk. The church is in the Decorated Gothic style, and consists of sanctuary, on which the nuns' choir looks from the south side; a nave of seven bays exclusive of the part occupied by the gallery at the west end, two aisles, lady-chapel to the south-west end of the south aisle, a spire, under which is the baptistry; also there are sacristies, confessionals, &c., together with a presbytery for two priests. A peculiarity of the church is the arcades of the nave being different. On the north side, there is the usual arrangement of arcade and clerestory, and on the south side, where the convent stands, the arcade is made lower to allow of a flat-panelled ceiling, over which is a triforium. This forms the passage to the western gallery, which is to serve for the use of the orphans. This feature is decided, but not obtrusive, and its object proclaims itself. The altar, also from the designs of Messrs. Hansom, has a frontal depicting the Last Supper, executed by Messrs. Farmer and Brindley. Above is a flat retable or super-altar, and again a stepped super-altar, rising to the expositorium, on which the monstrance stands for benediction or exposition. The expositorium is approached from the rear by a double flight of steps. The extreme length of nave and sanctuary (interior dimensions) measures 131ft. by a width across nave and aisles of 49ft. Each aisle is 85ft. in length by 13ft. in breadth, the width of nave being 33ft. The spire, surmounted by a copper cross, is 177ft. 6in. in height. The walls are of stone, and range in courses of masonry to correspond with the old work, viz., faced with two courses of Chudleigh limestone to one course of local limestone, the backing being of local rubble limestone. The plinth courses, quoins, relieving arches, weatherings of buttresses, &c., are in chisel-dressed local limestone, the window cills, jambs, head tracery, labels, door-jambs, head arches and labels, the pinnacles, parapets, gable tablings, copings, niches, gurgoyles, eaves-course, &c., and all similar external stone work are of Box-ground. The internal stonework to pillars, doors, tracery, gallery front, arches, groining under gallery, corbels, &c., is of Corsham Down, from the quarries of Messrs. Randall and Saunders. The carved cornice at top of tower, the stone landings at base of spire, and all stonework above same are of brown Portland stone.

CHAPEL OF THE ROMAN CATHOLIC CEMETERY, CLITHEROE.

This chapel, erected in 1878, consists of an oratory and a large open porch, in the design for which the form of the lych-gate of our ancient churchyards is somewhat retained. By openings on each side of the doorway, which are glazed with plate-glass, the interior of the chapel can always be seen from the porch. The illustrations given, which fully explain the rest of the design, are reproduced from the drawing in the Royal Academy Exhibition of this year. The contractors were Messrs. Hargraves and Whalley, and the architect was Mr. S. J. Nicholl, of 1, Caversham-road, London, N.W.

WOODSIDE.

The subject of our illustration is most tersely described by the inscription over the garden entrance from the pen of the Rev. T. Lees, the vicar of Wreay, and is as follows:—

L. O.
Hæc frons aprica, olim
a Sarâ Losh incepta,
tunc anno MDCCCXXXV
morte sororis carissima mœsté intercepta;
nunc demum a Jacobo et Isabella Arlosh
fausté est confecta A.S. MD.CCCLXXVIII.

Woodside, the seat of the ancient family of Loshes, or Arloshes, is situated some four miles from Carlisle, in the valley of the Pelleril, on the borders of the ancient forest of Inglewood, and was originally known as Inglewoodside; about a mile to the south of it is the picturesque village of Wreay, which, as its name denotes, was a clearing in the forest. The sunny front, to which the inscription refers, is entirely of ashlar, a creamy white freestone from the neighbouring quarry of Chalk—and was added to the then existing mansion before the year 1835, and is, therefore, a most remarkable example of the revival of Domestic Gothic architecture, designed and carried out under the personal superintendence of a most accomplished lady, an artist, and her own architect, whose method of working is thus described by Dr. Lonsdale, in his "Worthies of Cumberland": "As she only engaged country operatives, who had never shown the slightest feeling for art, she made her mouldings in clay, and then taught the mason how to work them in stone, and marvellously did she succeed." The work recently done in the completion of the front consists in the addition of the bay window, in the insertion of a transom in the windows, and the lowering of the cills, and in the better arrangement of the light to suit the rooms; for the front as Miss Losh left it, was, as usual at that time, symmetrically arranged on so-called Classical principles, the garden door being in the centre, and a similar arrangement of similar three-light windows on each side of it. The interior has been partially rearranged and completed, and the principal sitting-rooms fitted up in walnut mahogany and oak. On the first floor, the library, a fine room 43ft. by 28ft., with an open-timbered roof and oaken floor has been prepared for the reception of complete fittings, a chimney-piece, with seats in the chimney-corner, and projecting bookcases, with recesses for tables. The domestic offices and sanitary arrangements have at the same time been carefully revised. The mason work has been excellently executed by Messrs. James and William Baty, of Upperby, who personally worked on the building; the carpenter and joiner work throughout by Messrs. Creighton and Messrs. Black, of Carlisle. A half-timbered lodge has also been added, and a new drive laid out from the south. The works have been done under the direction of Mr. C. J. Ferguson, architect, of Carlisle.

ORGAN AT ST. JOHN BAPTIST'S CHURCH, HALIFAX.

The drawing of this organ at Halifax describes itself sufficiently. It is now being executed by Mr. Thompson, of Peterborough, and has been designed by Mr. John Oldrid Scott, in accordance with the ancient screens and stalls. The organ stands in the western bay of the north aisle of the chancel. The old Classic organ front will be used for the western side of the organ towards the nave.

MESSRS. ALEXANDER PIRIE AND SONS' NEW PREMISES, FARRINGDON STREET, E.C.

These lofty premises stand in a prominent position adjoining the Congregational Memorial Hall, Farringdon-street. Red Fareham bricks, jointed in black mortar and Portland stone, are the principal materials used in the front, the back, facing the railway, being executed in Beart's white bricks. The basement and ground floors are well lighted at the rear by means of skylights, and the ventilation has also been carefully attended to. The vaults under the street pavement are faced with white glazed bricks. An entrance for waggons or loading way, which can be closed when necessary by the folding doors, is provided in the centre of building. At the back of the loading way is constructed a lift, worked by a 3½ horse-power Otto gas-engine, placed on the top floor. The lift, which will be principally used in unloading the waggons, extends the whole height of the building. The water-closets throughout are fitted upon Banner's system, with the patent trap and ventilating cowls The external woodwork to the front is executed in wainscot, French polished, and the front sashes are glazed with British plate-glass. The stairs are of teak and pitch-pine throughout. The building is of a most substantial character, having been designed to carry very heavy goods. Rolled iron joists and cast-iron columns are used for the floors, and the flooring is tongued throughout. Much difficulty was experienced in building the foundations, necessitating considerable pumping, and a great depth and area of Lias lime concrete. The foundations were executed by Mr. G. Crabb, builder, and the superstructure by Mr. Lawrance, builder. The architect is Mr. George Vickery, 35, King-street, Cheapside, London.

CHIPS.

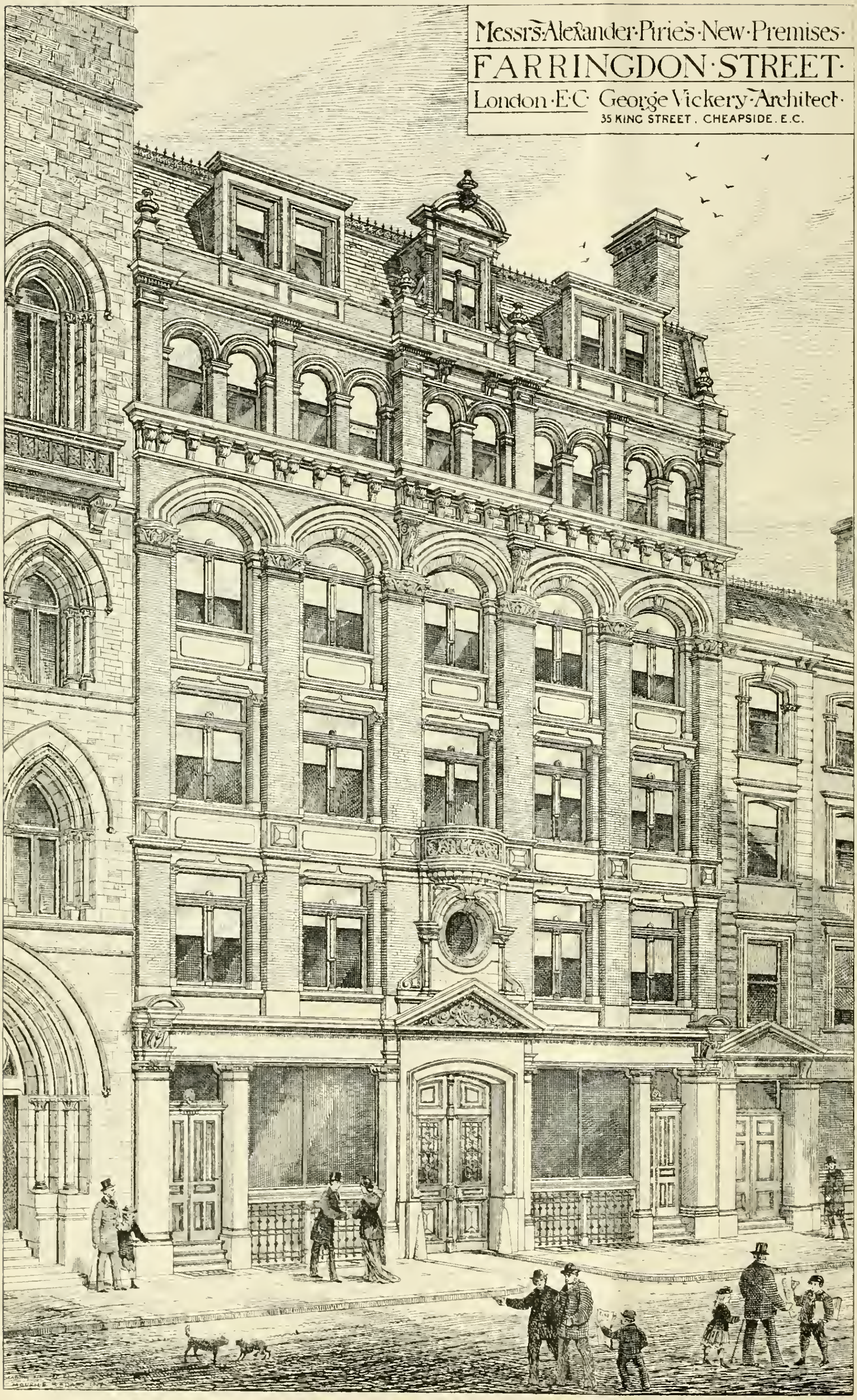
A new Wesleyan chapel, built of stone and brick, was opened at Churchstoke on Tuesday week. Mr. Hurst, of Welshpool, was the architect; and Mr. Pickstock, of Meifod, the contractor.

The salary of Mr. Robert Phillips, clerk of the works to the county of Gloucester, has been increased to £250 a-year. The mover of the resolution—the Chairman of Quarter Sessions—said Mr. Phillips was a very valuable servant of the county, and the increase was unanimously voted.

The alterations necessary for converting the premises in Hanover-street, Edinburgh, formerly occupied by the City of Glasgow Bank into a hall and offices for the Edinburgh Merchant Company have now been completed: and the formal opening of the new hall was celebrated on Wednesday. The alterations have been carried out under the direction of Messrs. M'Gibbon and Ross, architects, of Edinburgh.

A carved oak chancel screen, designed by Mr. H. Dudley Arnold, architect, has been placed in St. Andrew's church, Gorleston. The style is Perpendicular, freely treated, and has been carefully executed and finished by Messrs. Spaull, of Norwich.

The foundation-stone of the new Parochial Infirmary for Marylebone, which is to be erected near Ladbroke-grove-road, was laid on Tuesday. The building will accommodate 670 patients, and will cost £100,000. Messrs. H. Saxon Snell and Sons are the architects.



Messrs. Alexander Pirie's New Premises.
FARRINGDON STREET.
London E.C. George Vickery Architect.
35 KING STREET, CHEAPSIDE, E.C.

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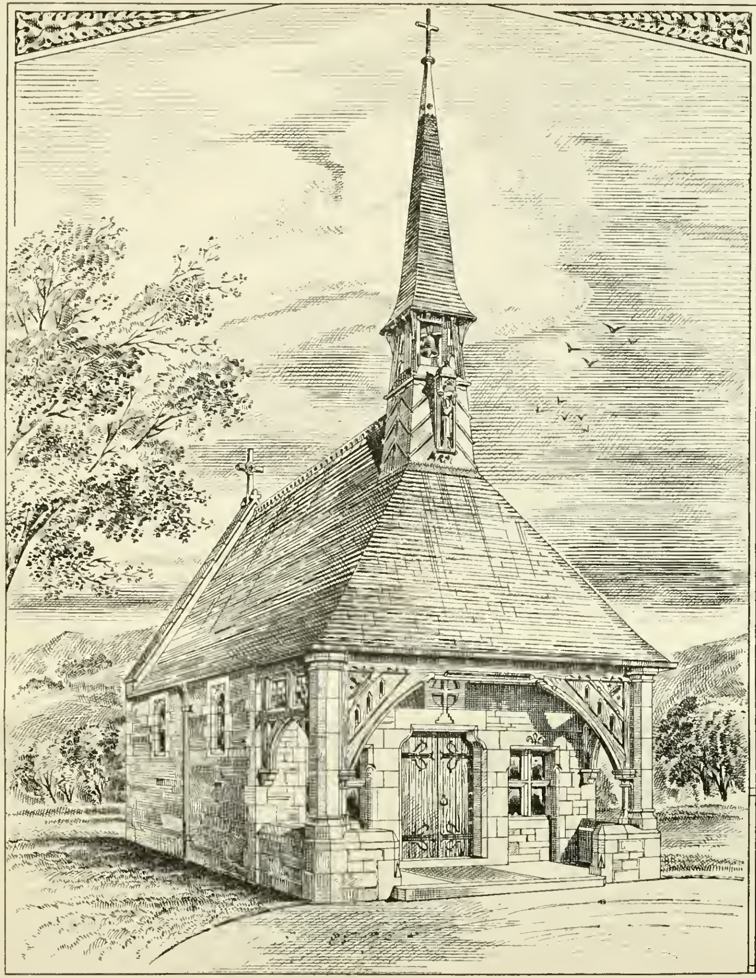
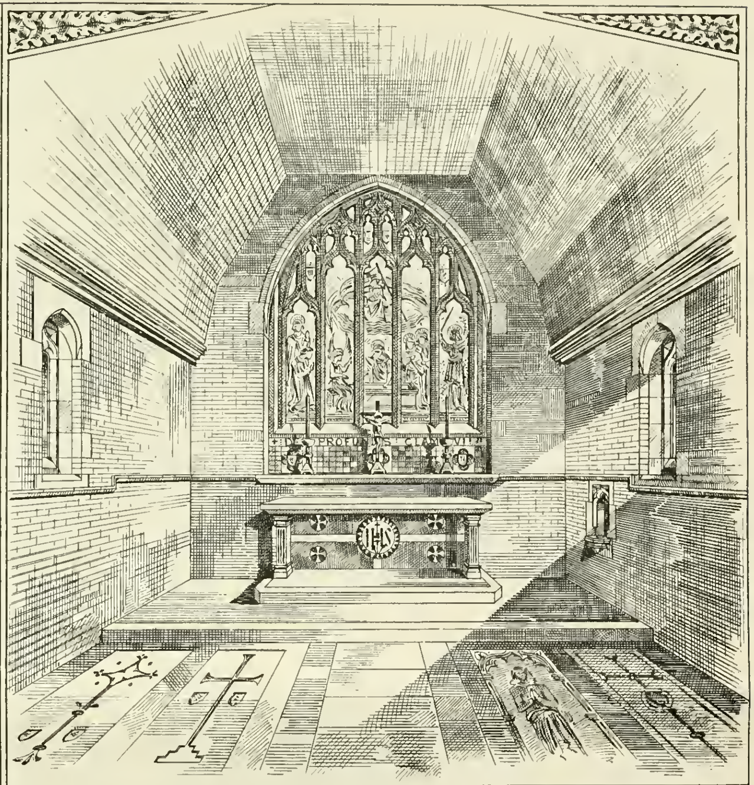
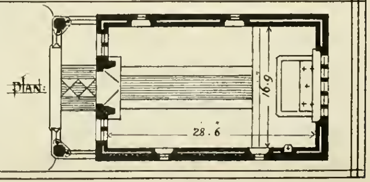




The·Chapel·for·the
Catholic Cemetery
Clitheroe·S. J. Nicholl·Arch^t



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CHURCH and PRESBYTERY of Our Lady Help of Christians & S. Denis: S. Marychurch for Wm. J. P. Chatto Esqre together with S. Mary's Priory. J. A. Hansom & Son Archts.

— REFERENCES —

CHURCH

1 SANCTUARY
2 NAVE
3 AISLES
4 CHAPEL
5 LADY CHAPEL
6 BAPTISTRY
7 CONFESSIONALS
8 SACRISTIES
9 DO DO

PRESBYTERY

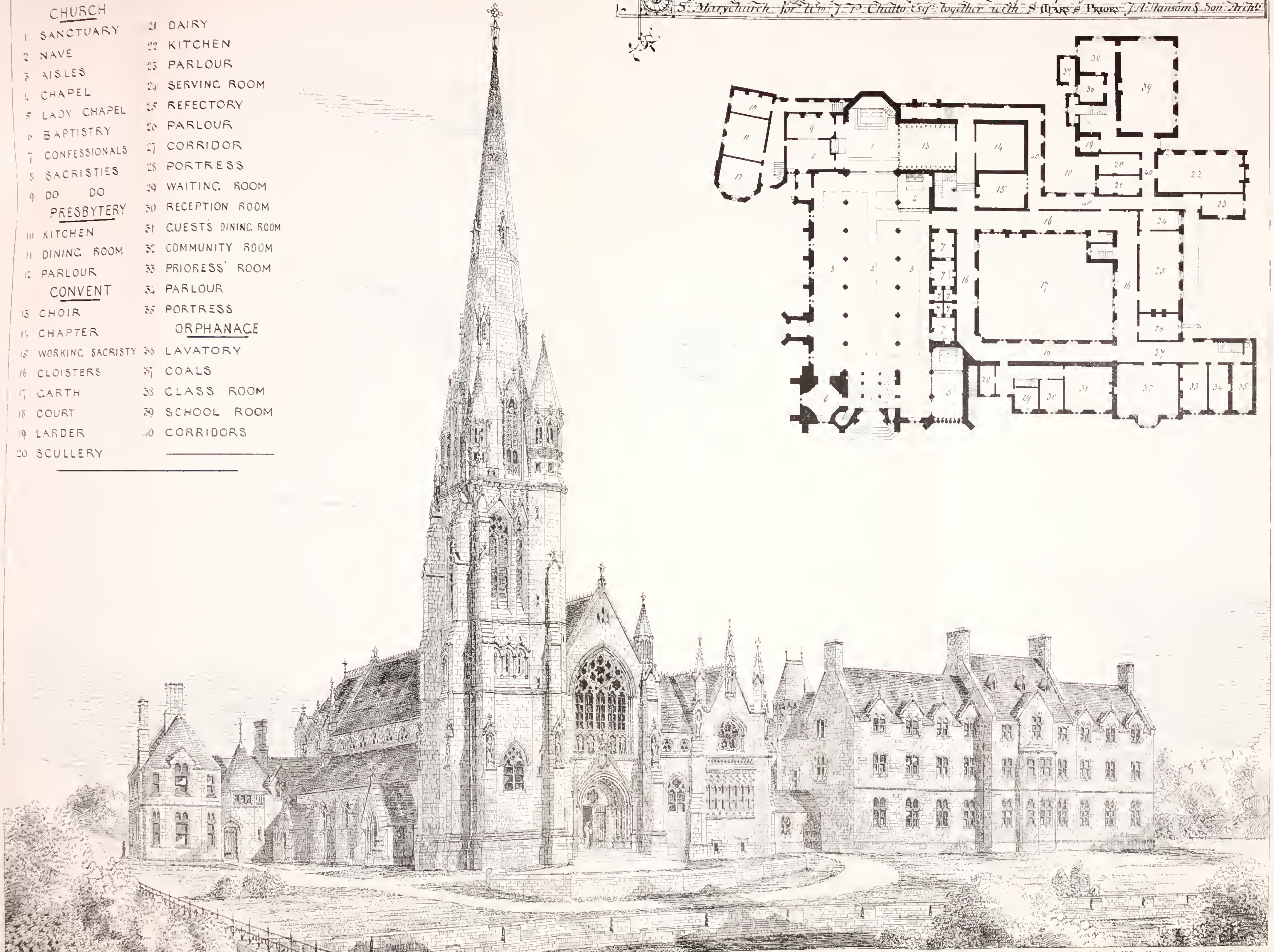
10 KITCHEN
11 DINING ROOM
12 PARLOUR

CONVENT

13 CHOIR
14 CHAPTER
15 WORKING SACRISTY
16 CLOISTERS
17 GARTH
18 COURT
19 LARDER
20 SCULLERY
21 DAIRY
22 KITCHEN
23 PARLOUR
24 SERVING ROOM
25 REFECTORY
26 PARLOUR
27 CORRIDOR
28 PORTRESS
29 WAITING ROOM
30 RECEPTION ROOM
31 GUESTS DINING ROOM
32 COMMUNITY ROOM
33 PRIORESS' ROOM
34 PARLOUR
35 PORTRESS

ORPHANAGE

36 LAVATORY
37 COALS
38 CLASS ROOM
39 SCHOOL ROOM
40 CORRIDORS



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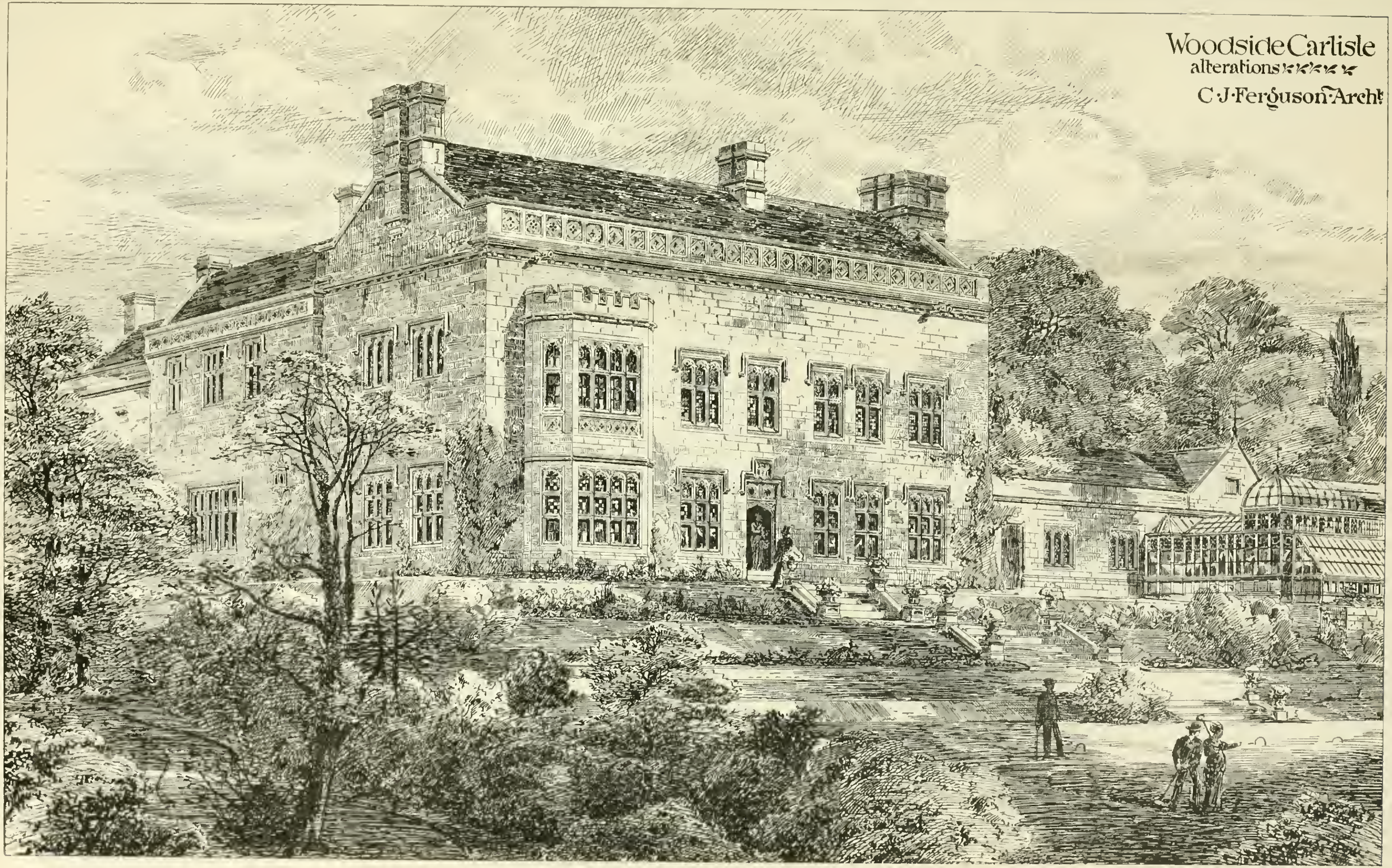

Woodside Carlisle
alterations
C.J. Ferguson Archt.

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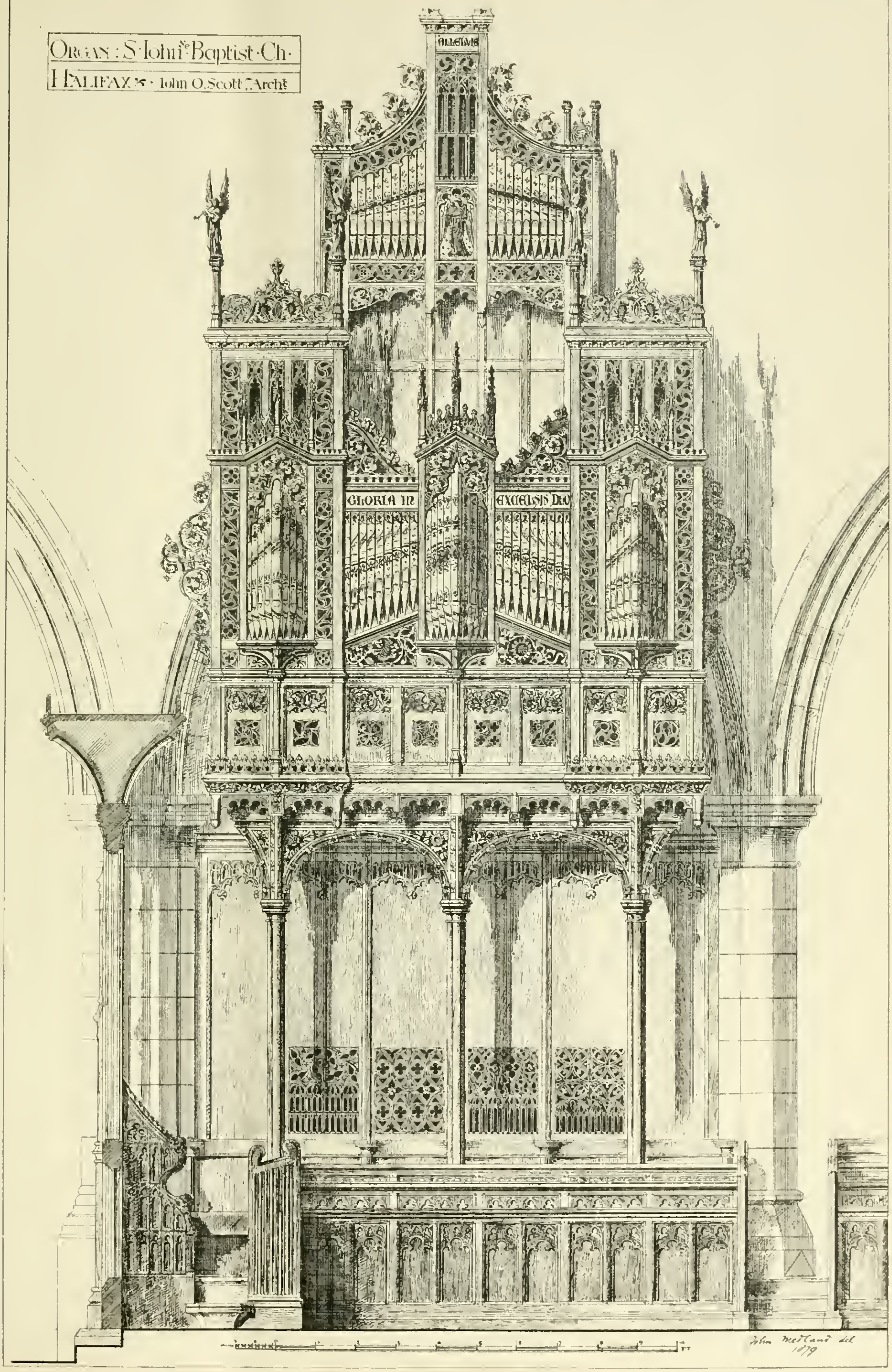
ORGAN : S. John Bte. Baptist Ch.
HALIFAX — John O. Scott, Archt.



John Medland del
1879

Photo Lithographed & Printed by James Akerman, 6, Queen Square W.C.

THE CHURCH OF ST. SAVIOUR, FORMERLY ST. MARY OVERIE, SOUTHWARK.

THE members of the London and Middlesex Archæological Society, including the President, Lord Talbot de Malahide, and a large number of ladies and gentlemen, visited this interesting portion of a Priory Church on Thursday last. The party were conducted over the building by Mr. Francis T. Dollman, F.R.I.B.A., who afterwards read, in the retro-choir, a paper upon the architectural history of the building. The lecturer exhibited a very numerous collection of old engravings and drawings, block and detail plans of the church prior to the wholesale destructions effected fifty years ago, and a careful restoration on paper of the former nave,* founded on many years' careful study and investigation of the remains, and of the illustrations above referred to and other authorities.

Mr. Dollman said he proposed to give a general outline of the building, and then to ask members to accompany him in its inspection, beginning at the north aisle, and returning to the retro-choir to read an historical paper. As now existing, the church, broadly speaking, consists, he remarked, of an Early English choir of four bays, with north and south aisles, and a retro-choir or Lady-chapel also with side aisles, and centrally divided into two other aisles by a range of columns, a central tower and north and south transepts, and north-east chapel (now a vestry), and to the west, on a higher level, a modern nave. A table hung on the walls would show that the principal dimensions were:—Old nave (demolished), 135ft. long by 58ft. 9in. wide, including aisles; choir, 78ft. 6in. by 60ft. 6in.; retro-choir or Lady-chapel, 60ft. 9in. by 41ft.; former Bishop's, or so-called Lady Chapel (demolished), 51ft. 6in. by 17ft. 3in.; transepts each 36ft. by 24ft. wide; former Mary Magdalene Chapel (demolished), 51ft. 6in. by 22ft. 9in.; total length of church in clear of walls, 284ft. 3in.; and including walls, 292ft. 3in.; total width at transepts, in clear of walls, 113ft., and including these, 123ft.; central tower, square, 35ft.; height to parapets, 129ft. 6in.; to pinnacles, 163ft. 6in.; height of nave and choir, 54ft. The modern nave was built upon the old foundations, and like the former one had a marked declination to the south. The portion of the building in which they were assembled was now known as the consistory court, from its former use, but this was a misnomer; it occupied a similar position to the Lady-chapel at Salisbury, Winchester, Exeter, and Wells. It had the peculiarity of being divided into four instead of three vaulted and groined aisles by two clusters of piers—an arrangement seemingly occasioned by its awkward width. Opposite the second bay to south stood, prior to 1830, an eastern extension, known as the Bishop's Chapel, because the pre-Reformation bishop, Launcelot Andrewes, of Winchester, was buried there. The windows proved that that chapel was of the period of Edward IV. Directing attention to the north-east angle of the retro-choir, Mr. Dollman said there were traces there of an altar tomb and chantry. The window was of later date than the rest of chapel, and traces of two piscinas and other adjuncts of the altar were found during the restoration by Gwilt in 1832. On a little shaft high up at this north-east angle might be seen a statuette, which apparently was at first intended for the Virgin Mary, but had been altered at a subsequent date, and headdress cut into a mitre so as to represent a bishop. On the west wall of the chapel was the fine altar tomb of Bishop Andrewes removed from the Bishop's Chapel to this place, Going into the north choir aisle, Mr. Dollman drew attention to the monuments on the walls. These are principally of the 16th and 17th centuries, the church being almost without memorials of the friars and other persons buried in the church in mediæval times. In this aisle is an oaken effigy usually called that of the father of the foundress of the priory, but which is more likely to be one of a family who were great benefactors to the church in Edward the First's time. The figure has been greatly tampered with, and the sword and face are modern. Close by is a fine monument to John Treahearne, a gentleman porter to James I.; the escutcheon shows a play on the name, three herons occupying the field. Passing into the vestry off the west end of this aisle, Mr. Dollman said that although greatly altered in 1817, and completely modernised, this was one of the earliest portions of the fabric, there being some Norman fragments on the exterior. It was formerly an apsidal chapel to north transept. Passing out of the vestry into the transept, the junction of the 13th century arch buildings at the end of the aisle, and of the 14th century work in the transept was pointed out, and the finer finish and contour of the former work was very noticeable. In the north transept the groining is modern and is in plaster, following the lines of the old wooden work. Much of the stonework here was repaired in cement at the same time by Wallace. On the west wall is a large monument dated 1623, to one William Austen; it is elaborately carved, and there are traces of rich painting and gilding upon the angels and suns and other emblems upon it. Many of the party ascended the turret staircase into the tower, which it was shown was originally two stories in height and open to the ceiling. Fragments of the old cornice and of the painted stars and other ornaments of the ceiling still remain in position. The lecturer showed the junction lines of the belfry added by Bishop Fox; the present pinnacles were added in 1818, and are loftier than the original ones. In the south transept is a large triple-canopied monument to the poet Gower, with a coloured effigy; it was observed that the whole of the decoration and some of the structural ornament is modern, having been added when the memorial was removed from the north aisle of old nave, at the expense of the first Duke of Sutherland in 1843. The cardinal's hat and arms of Cardinal Beaufort are attached to the wall close by, and resemble those at St. Cross, Winchester, to which he was also a benefactor. The style of this transept is distinctly later than the north one, and the work of reconstruction, Mr. Dollman suggested, was gradually carried from north to south, through the fourteenth century. The modern nave is shut off from the ancient church not only by an unsightly partially-glazed screen, but by being built on a higher level, and approached from the transepts by flights of steps. Its inspection did not long detain the visitors. Wiry iron columns support a plaster vault and heavy gallery, and the windows which externally range with a clerestory are the aisle and gallery lights within. The fittings are of the poorest type of the revived Gothic of half a century since, and the limewash with which the walls are coated completes the contrast with the architecture of the eastern limbs of the church, graceful in its proportions and exquisitely refined in each detail and moulding; not even injudicious restoration, nor its present grimness and decay can destroy the charms of the old work. Descending to the vaults at the west entrance to nave, Mr. Dollman indicated the foundations and plinth of the former building, and the party returned to the choir, where the massive cylindrical piers with engaged shafts and richly moulded arches, the triforium arcading and lofty lancets of the clerestory repaid attentive examination. The details on the north and south sides are different, and the dogstooth carving in the chamfer of the triforium shafts has been omitted on the south, and the other details simplified, apparently owing to a necessity for economy. At the east end the vista is closed by the fine stone altar screen erected by Bishop Fox, of Winchester, and resembles that at the cathedral of that city. It is panelled and divided into canopied niches in many tiers. The alterations effected by Gwilt appear to have been carried out with some skill in following the original details.

Returning to the Lady-chapel, Mr. Dollman read his historical paper on the church. The priory, then known as St. Mary Overie, was refounded, he said, in 1106, when the establishment was said to have been changed from secular canons to one of the Augustines. Some traces are to be seen outside the south-east portion of nave, and at the inner east angle of north transept. North and south of the nave there were apparently foundations of what were intended to be flanking towers like those at Wells. Part of the church was destroyed by a great fire in 1212. Peter de Rubibus had it rebuilt, and the work seemed to have progressed from west to east, and from north to south, for from the measured drawings of the old nave made by the late Charles Edwin Gwilt it was apparent that the work in the choir was far better and more advanced in style. About this time a magnificent south porch (which some persons might remember) was added to the nave. The vaulting throughout was quadripartite, but in lozenges, giving a trapezoid form to the vaults. The transepts were inclosed in a continuous arcade, into which openings were made in the Tudor period. The Lady-chapel appeared from its windows to be of the period of Edward III. In the First Edward's reign the priory appeared to have been very poor, and a petition was issued about 1273. The reconstruction of the transepts was carried on throughout the greater part of the 14th century. Cardinal Beaufort and the poet Gower, whose memorials had just been seen, contributed to the church repairs, but the statement so often repeated that the church was rebuilt about 1400 was incorrect, and was indeed contradicted by the architectural style. At that time the church they read of was filled with stained glass, but that had long since disappeared. In the reign of Richard II. another fire much injured the church, especially the nave, but the damage was speedily repaired. During this work probably some of the clerestory windows at the west end of nave were altered from the lancet form to that of the ordinary Perpendicular two-light; and unfortunately some of the flying buttresses taken down for this purpose were not replaced, thus impairing the walls: to this apparently trifling change we owe the loss of that portion of building. In 1469 the old roof was replaced by vaulted groining of quadripartite design, but in lozenges giving a trapezoid form to the vaults. This in the transepts was in wood. The beautiful west-end doorway of the old nave might be assigned to this period. Early in the next century Bishop Fox erected the upper stage of the tower and the very elaborate reredos. Before the members were three drawings; the smallest was a representation of the so-called Classical altar-piece of oak and plaster, which from the days of Wren till forty years ago, concealed from view Fox's reredos; the second showed the reredos as it appeared when Gwilt revealed it, and the third showed by shading its restoration by Wallace, the whole forming an interesting historical record of the successive alterations to the screen between the choir and Lady-chapel. At the Reformation the priory was dissolved, but Henry VIII. allowed the parishioners of Southwark to purchase the church, and in 1540 it was united with the parishes of St. Mary Magdalen and St. Margaret-at-Hill, and made parochial under the style of St. Saviour. The church had now attained its climax architecturally, and the subsequent history is one of alternate alteration and neglect, and the destruction of the buildings now found burdensome to maintain. The supplemental chapels and chambers were, of course, the first to suffer. During the reign of Queen Mary the Lady-chapel, in which the members were assembled, was used as a consistorial court by Bishop Gardiner, and heretics were sentenced here to the stake. This did not last long, the Popish vestments were destroyed, and for about sixty years, according to Stowe, the Lady-chapel was used as a bake-house, but in 1644 the baker was expelled and the building was repaired and beautified at a cost of £200. The south-east chapel of St. Mary Magdalene was soon after the desecration of the Lady-chapel altered to serve as a vestry. Galleries were next erected in the nave and on the south side of chancel. In 1618 a new organ screen was erected. In 1622-3 the church was restored in many places, the whole north side repaired "in a very substantial and very artificial manner," and also whitewashed. In 1676 a fire broke out in the neighbourhood and destroyed the old Tabard of Chaucer's time, and effected a great clearance and reconstruction of the streets around the church. At this time the roof of the east-end and chapel were covered with plain tiles. From this period the neglect of the building went from bad to worse; not only were burials made immediately within and around the church, but an opening from the great vault was made directly into the church. In 1689 the pinnacles of the tower were altered, and new vanes placed thereon. In 1703 extensive alterations were effected in the church and the chapels, and in 1734 the west and south walls were coated with brick and repaired with the same material. In 1735 all the beautiful tracery shown in Hollar's view was taken out of the south transept window. In 1758-9 the present large clock was placed in the tower with dials on two sides, and in 1764 the high-pitched roof of choir was replaced by a lead flat, and the north transept was re-tiled and altered. From this date the marks of decay in the nave continually became more apparent, and it was considered how long it would be before it would fall. At length, in 1818, it became absolutely necessary to repair the tower, and under the superintendence of Mr. George Gwilt, a system of cast-iron bracing-rings and ties were placed round each pier, and also round the walls. In 1822-4 the chapel of St. Mary Magdalene was removed from the south side of the choir; the Lady-chapel was altered by Mr. Gwilt, who erected the present east front, with its four gables. A group of small houses which had been built into the south choir aisle, were most righteously removed, the aisle carefully rebuilt, and in the east gable of the choir Mr. Gwilt inserted two lancet lights in place of the Perpendicular window, with happy effect internally, at any rate. The weather line on the tower shows that the new choir roof was lower than the original one, but to a considerable degree the old work was followed. The criticisms upon this work would be, the lecturer thought, less severe were the time remembered at which the work was done, and also if it were borne in mind that Gwilt was hampered with instructions and counter-instructions from an ill-informed and not too complaisant committee. This restoration was carried out entirely gratuitously by Gwilt, and was completed in 1832. In 1826 a scheme was started for rebuilding the nave; a competition was instituted, in which George Gwilt was awarded the premium of 100 guineas, but it was abandoned. In 1829 an interesting Norman doorway was discovered at the west end of nave, but was closed up again. In 1830 the Bishop's chapel, which extended eastwards from the southern bays of the Lady-chapel, was actually demolished, as it was supposed to interfere with the vista from new London-bridge. In the same year the transepts were restored by Robert Wallace, who, it was much to be regretted, used a material so keenly sensitive to the London atmosphere, as Bath stone was used for external masonry, and even cement for internal work. The south transept window was restored from one in Winchester Palace. Soon after this the nave roof was said to be absolutely dangerous, although some of the timbers he had recently seen appeared in excellent condition, and it was accordingly removed; and a few years later, in 1839, the roofless walls were removed and the present nave was begun. In 1831 a movement had begun having for its object the total removal of the retro-choir or Lady-chapel, in order to widen the approach to London Bridge, but Dr. Sumner, the then Bishop of Winchester, refused to allow it. In January, 1832, the vestry determined that the chapel should be taken down, when a poll was demanded, and the numbers were 380 for preservation and 140 for destruction. In 1833 the remains of the reredos were brought to light, and it was restored by Wallace in the following year. The erection of the new nave in 1841 did not go uncriticised, Augustus Welby Pugin condemning it unsparingly in an article in the *Dublin Review*, in which he called attention to "the atrocities lately perpetrated in this venerable church, where," he said, "in the nave, replacing one of the finest specimens of Gothic architecture, we have as vile a preaching-place, crowded with galleries and gaslights, as ever disgraced the nineteenth century." Nothing, Mr. Dollman added, has been done to the church of late years, but it might be hoped that, as the metropolitan church of the Diocese of Rochester, over it might be written the auspicious word "Resurgam." In closing, he must notice that nearer the river, a short distance north of the transepts, were remains of a vaulted building 108ft. by 25ft., which formerly constituted one side (the west) of the cloister quadrangle; over this had been the dormitories.

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* Mr. Dollman's perspective view of the restored nave was reproduced in the BUILDING NEWS for June 15, 1877 (Vol. XXXII., p. 592); and Mr. G. E. S. Langford's measured drawings of the choir (for which he was awarded, in 1877, the silver medal of the Royal Academy), on January 25 and March 8, 1878, pp. 82, 238, Vol. XXXIV.; see also article "A New Cathedral for Southwark," in our issue for November 22 last year, p. 523, Vol. XXXV.

ST. MARY-AT-HILL.

The members afterwards visited the Church of St. Mary-at-Hill, near Eastcheap. It is an excellent example of Wren's smaller churches. A Greek cross on plan, it is lighted by a central lantern, and by windows in the north and south limbs, and is covered with barrel vaults, with a quadripartite dome at the intersection. It is adorned with a profusion of elaborate carving in wood of foliage and fruit upon reredos, pulpit, organ, and pews; this was executed thirty years ago by W. Gibbs Rogers. In the church the rector, the Rev. A. Trower, read a short historical account, showing that it can be timed to the thirteenth century, and then consisted of nave, many chantries with their altars, and a west tower; that it was partly burnt down in the Great Fire, which originated close by, and was rebuilt in 1672-7, "Dr. Wren" being consulted on the subject; according to the parish accounts, the cost of erection was £3,980 12s. 3d. The old tower, a picturesque structure with a turret at one angle, stood till 1788, when it was replaced by the present unsightly one in brick. Mr. Birch congratulated the members on the fact that this church, scheduled by the Inner Circle Completion Bill of the present session, had been saved by the remonstrances they and other societies had made, and an adjournment was made to the vestry, where the rector exhibited the churchwardens' accounts, which are very complete, though tattered in places, and go back to 1480. It is not known how they were preserved during the Great Fire, but a strong room has been of late years constructed adjoining the vestry to insure their safe custody in the future.

METROPOLITAN BOARD OF WORKS.

AT the meeting of this board on Friday the question of the sale of the freehold of the first sites cleared under the Artisans' Dwellings Act, 1875, came up for consideration upon a report from the works committee. This committee submitted a letter from the trustees of the Peabody Donation Fund, dated 26th May, 1879, offering to purchase the freehold of the following sites under the Artisans' Dwellings Improvement Act, 1875, viz.: Whitechapel and Limehouse (the portion cleared), for the sum of £10,000, and the freehold of the following sites, namely, Bedfordbury, Great Wild-street, Pear Tree-court, Whitecross-street, and Old Pye-street, at twenty pears' purchase upon a rental of 3d. per superficial foot, and recommended that the offer be accepted, on the terms and conditions stated in such letter. Mr. Dresser Rogers, chairman of the committee, traced the history of the Artisans' Dwellings Act, and explained that this board now appeared to have come to a dead-lock. They had purchased some thirty-one unhealthy areas at a high price and had invited tenders and offered by auction the first site cleared, that at Whitechapel, and some others without receiving a single response. Many attempts were made to let the land for the erection thereon of artisans' dwellings, but the restrictions imposed on those building deterred speculators, and they were informed that the price asked was too high. The Peabody donation trustees had now made them an offer of twenty years' purchase at 3d. per foot capitalised, and he recommended that this be accepted, low as it undoubtedly was, for they had no alternative but to comply with the restrictions laid down by the Act, and there appeared no probability of a more favourable offer being made. If the Act had gone on common-sense principles and allowed the population to be housed on other sites than the ones cleared, they might have got four times the present offer for the land to be used for commercial or other purposes if sold without restrictions, but they were bound by the terms of the Act. Mr. F. E. H. Fowler moved as an amendment that the offer of the Peabody Trustees be not accepted, but that the whole question of the working of the Act be represented to the Home Secretary, and that he be asked to propose fresh legislation upon it, so that the objects of the Act may be obtained without such a ruinous cost to the ratepayers. The advisability of removing unhealthy dwellings from the metropolis was admitted by all, great obstacles were raised by the terms of the Act itself, especially in its requirement that the same number of people should be provided for on a site as were displaced. As a consequence, the net cost would be so great that the operation of the Act could not be regarded by the great mass of the ratepayers as satisfactory. The six schemes for which an offer had been received from the Peabody Trustees had cost the board about £80,000 per acre, whereas they were being offered £10,000, so that they were asked to accept an offer of one-eighth the cost. The loss on the six schemes would be £643,641, and that on all the proposals would be between two or three millions. He did not think they were called upon to make so woeful a sacrifice. A long discussion ensued on the general question of the working of the Artisans' Dwellings Act. The objections to the Act were stated to be—first, that the sites, although condemned as unhealthy, had to be purchased under arbitration at rates as if they were wholesome; and secondly, the restriction compelling the same number of inhabitants to be provided for on the exact site. Mr. Freeman pointed out that the object of this was to avoid driving the tenants entirely from the metropolis, and urged that the offer was a fair one, and should be accepted. Mr. Selway mentioned that the Whitecross-street scheme would cost £85 4s. 6d. per head of those displaced. In the event, the offer of the Peabody Trustees was accepted, the amendment being rejected by 24 votes to 10.

In the matter of the difference which has arisen between the Thames Conservators and the Board with regard to banks or obstructions in the River Thames Mr. F. J. Bramwell was appointed arbitrator on behalf of the Board. The officers of the Board were instructed to negotiate with the lord of the manor of Hackney for the purchase of his rights in Hackney Downs, London Fields, Well-street Common, North Mill Field, and South Mill Field.

The Building Act Committee reported that they had considered all the objections and suggestions made by various societies of architects, surveyors, and builders, local authorities, and others to the Home Secretary, and by him forwarded to the Board, with reference to the bylaws made by the Board under the provisions of the Metropolis Management and Building Acts Amendment Act, 1878, and had made various modifications in the bylaws; they submitted the bylaws as modified for the approval of the Board, and recommended that they be sent to the Secretary of State for confirmation.

Mr. F. H. Fowler sought to amend the second clause, which provides that every external wall shall be constructed of "good sound well-burnt bricks," as it would practically render it necessary that all outside walls should be of best stock. This was, he urged, quite unnecessary, as seconds' or grizzled bricks were quite good enough for filling-in purposes, and the enforcement of such a clause would increase the cost of building without any compensatory benefit. On being put, Mr. Fowler's suggested alteration was rejected by 8 votes to 5. The bylaws were passed as modified by the committee and ordered to be sent to the Home Secretary.

A memorial, signed by the Permanent Under-Secretary of State for War, the Director of Army Contracts, the Accountant-General of the Army, and others, was received, calling attention to obstruction occasioned by the crowded state of the public footway on Charing Cross Bridge, and suggesting that the south-west footway should be opened for foot passengers, and the approaches to the bridge improved. It was referred to the works committee, as was also a letter from the vestry of St. Martin-in-the-Fields, calling attention to the outrages committed on certain persons whilst passing over this footbridge.

UNIVERSITY COLLEGE, LONDON.—PRIZES, 1878-79.

SLADE Fine Art Scholarships, £50 per annum for two years.—Scholars, J. P. Beadle of London, A. C. Tayler of London.

Engineering and drawing, Professor Alex. B. W. Kennedy, M.I.C.E. (Dean of Science).—Civil Engineering. Prize. E. C. J. Devis of Birmingham. Certificate, 2. C. de Verteuil of Trinidad.—Mechanical Engineering. Prize. H. E. Lockhart of Blackheath. Certificates, 2. E. C. J. Devis of Birmingham. 3. equal. A. G. Ashcroft of London, T. W. Weston of Coalbrookdale.—Theory of Machines. Prize, equal. T. W. Weston of Coalbrookdale, T. M. Teed of London. Certificates, 3. A. G. Ashcroft of London. 4. A. S. Vowell of London.—Surveying. Prize. W. G. Nottage of London. Certificates, 2. H. J. Porter of Budleigh Salterton. 3. H. W. Teed of London. 4. H. P. Thomassett of Walthamstow. 5, equal. H. G. Lange of Trinidad, T. T. Prentice of London.—Engineering Drawing. Second Year: Prize. T. W. Weston of Coalbrookdale. Certificates, 2. A. S. Vowell of London. 3. T. M. Teed of London. Third Year: Certificates, 1. A. G. Aschroft of London. 2. John Buchanan of Dumbarton.

Architecture, Professor T. Hayter Lewis, F.R.I.B.A.—Mediæval and Renaissance. Donaldson Silver Medal. F. Sanders of Cheshunt.—Ancient. Prize. B. J. Capell of Weedon.—Construction, Senior Class. Donaldson Silver Medal. R. E.

Smith of Forest-Hill. Prize. F. Sanders of Cheshunt. Certificates, 3. E. Pertwee of London. 4. B. J. Capell of Weedon. Junior Class. Prize. A. B. Cottam of Watford. Certificates, 2. W. Bisiker of London. 3. W. J. Lauder of London.

Fine Art, Professor Legros.—Painting from Life. Prize of £10 and Silver Medal. J. B. Clark of Cerne. Certificates, 2, equal. H. S. Tnke of Falmouth, W. Strang of Dumbarton. 4. R. Arnold of Dorking. 5. T. C. Gotch of London. 6. Dorothy Tennant of London.—Drawing from Life. Prize of £5 and Silver Medal. W. Strang of Dnmbarton. Certificates, 2, equal. Ethel J. Rosenberg of Bath, R. Arnold of Dorking, W. H. T. Hunt of London. 5, equal. Emma M. Sargant of London, H. R. Rose of London. 7. T. C. Gotch of London. —Painting from Antique. Prize and Silver Medal. Dorothy Kate Richmond of New Zealand. Certificates, 2, equal. J. P. Beadle of London, Charles Sainton of London, E. O. Davey of Romford. 5. E. Sichel of Bradford. 6, equal. J. T. Fairs of Horley, Christiana J. Powell of London. 8, equal. Lucy E. Davidson of Aldeburgh, Edith M. Mason of London.—Drawing from Antique. Prize. E. Sichel of Bradford. Certificates, 2. Christiania J. Powell of London, J. P. Beadle of London, A. C. Tayler of London. 5. B. C. Doyle of London. 6, equal. Alice Harris of London, Edith M. Mason of London.—Anatomical Drawing. Prize. H. R. Rose of London. Certificates, 2. P. G. Sturdee of London. — Etching. Prize of £5 5s. (presented by Mr. Hirst Smythe). Prize. H. S. Tuke of Falmouth. Certificates, 2. J. B. Clarke of Cerne. 3. W. Strang of Dumbarton. 4. Ethel J. Rosenberg of Bath.—Composition. Prize of £10 (presented by Prof. Poynter, R.A.). J. B. Clark of Cerne. Certificates, 2 equal. T. C. Gotch of London, H. S. Tuke of Falmouth. 4, equal. E. M. Cox, of London. Emma M. Sargant of London. 6. E. Sichel of Bradford.—General Proficiency. Alva Grant Brown of London, Edith Hutchinson of London, Eleauor Hallé of London, Alexina M'Ritchie of London, Theodore Cook of London, Hon. Herbert Pakington of London, H. T. Dicksee of London, Everard Hopkins of Hampstead, J. N. Drummond of Manchester.

Fine-Art Anatomy, Professor G. D. Thane. First Certificate. Francis W. Caulfield of Crowthorne.—Slade Prize. E. O. Davy of Romford. Certificates, 3. Lucy Nisbet of London. 4. May H. Barker of Charlbury. 5. Sara C. Harrison of London. 6. Ellen Mary Rope of Blaxball. 7. Elizabeth C. Petrie of London. 8. Alice Gow Stewart of Hawkhurst. 9. Letitia E. H. Tiddeman of Hastings. 10. James S. Allen of London.

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PARLIAMENTARY NOTES.

The New Street from Charing-cross to Tottenham Court-road. — Mr. Fawcett, on Monday, asked the Chairman of the Metropolitan Board of Works whether, considering that sanction was given by Parliament in 1877 to the construction by the Metropolitan Board of Works of a new street from Charing-cross to Tottenham-court-road, he could inform the House when the street would be commenced, and what was the probable time that would be required for its completion.—Sir J. M. Hogg replied: I am sorry to say that I am unable to give my hon. friend the information he seeks. I may, however, remind him that the street from Charing-cross to Tottenham-court-road is but one of twelve improvements sanctioned by the Act of 1877, some of which are now far advanced, many hundred claims having been received and settled. The Charing-cross improvement has not yet been dealt with, and I may mention that, in consequence of the stringent clauses in the Act of Parliament requiring the Board to procure the erection of buildings to accommodate 5,497 of the labouring classes who will be displaced in this and the other western improvements, much difficulty will be experienced in carrying into effect the powers of the Act, unless nearly all the building sites fronting the new street are appropriated to the purpose and disposed of at a mere fractional part of their market value, a course of proceeding which, I venture to think, was never contemplated by Parliament, and which would spoil the appearance of what ought to be one of the finest thoroughfares in the metropolis. The Board, I may add, have been in communication with the Home Secretary on the subject, and I hope some progress may soon be made in an improvement for which the metropolis is so much indebted to my hon. friend.

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The Court of Common Council, at its meeting yesterday (Thursday), adopted plans prepared by Mr. Horace Jones, the City architect, for the construction of a new fruit and vegetable market. The estimated cost is £115,000.

COMPETITIONS.

City of London School Competition.—The meeting of competitors advertised last week took place on Tuesday, at the Cannon-street Hotel. Admittance was refused to our reporter—a somewhat strange proceeding on the part of those whose principal object in convening the meeting was avowedly to obtain publicity for the drawings. An account of what transpired at the meeting, which has been sent to us for publication, states that more than half of the competing architects were present, and that a resolution was unanimously agreed to, that a memorial be presented to the Court of Common Council expressing satisfaction at the course adopted by the committee in exhibiting the designs, and requesting that the exhibition might be open for fourteen days at the least, and also asking the court that the various designs might be referred to an independent architect to examine and report on before the final award is made. The proceedings were very unanimous, and it was strongly felt that some architect of eminence, whose decision the whole of the competitors would be willing loyally to accept, should report on the designs, more especially as this competition might be a precedent for others. The final report of the committee submitting for premiation three designs for the schools should have come before the Court of Common Council yesterday (Thursday), and Mr. Jas. Edmeston intended to move an amendment thereon referring all the designs sent in to the President of the Institute, the premiums to be awarded according to his report. Owing to the lateness of the hour at which the subject was reached, however, its consideration was adjourned till the next meeting of the Court.

Devonport Public Hall Competition. — Of the eighteen designs for the new Devonport Public Hall the committee have selected two drawings, that of Mr. S. Knight, 23, Cornhill, London, who has been awarded the first premium; and that of Mr. H. Moorshead, St. Aubyn-street, Devonport, who has been awarded the second premium offered by the committee. In selecting these designs the committee obtained the opinion of Mr. E. A. Gruning, of Gresham House, London. Mr. Knight has since been instructed to proceed with the working drawings. The style will be Italian. The building is to be constructed of the best materials, the walls of local limestone, stuccoed externally in Portland cement. The architect estimates the entire completion of his design at from £12,000 to £13,000.

Gloucester Asylum Competition. — At the Gloucestershire Midsummer Sessions last week it was announced that twenty-eight plans had been received for the new asylum, but that owing to the impossibility of getting all the members of the committee together the prizes had not yet been awarded. We believe an exhaustive report on the designs is now being prepared for the magistrates by the clerk of the works for the county, and the decision will probably be shortly arrived at. The great decrease in the number of insane persons during the past six months is, we are informed, mainly responsible for the delay in connection with the erection of the new asylum.

Ipswich. — By a printer's blunder last week in the advertisement announcing the competition for the erection of a new exchange, offices, &c., at Ipswich, the premium offered was stated to be "two guineas." It should have been "100 guineas."

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CHIPS.

The Hellenic Archæological Society has resolved to restore the famous lion of Chæronea, which surmounted the tomb of the Bœotians killed in the battle against Philip, B.C. 338, and which was blown up in the War of Independence under the idea that a treasure was concealed under it. The fragments now lying in a ditch, near Kahurnor, in Bæotia, or scattered on the road to Livadia, will be collected and put together.

Messrs. Millar and Symes, of Dublin, have been elected architects to the Bank of Ireland, the post being vacant by the resignation of the late architect. There were upwards of twenty-five candidates. The post is worth £300 per annum, together with percentage on all new banks, and does not necessitate the giving up of other business.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Inquirer. (The variation of the compass is about 18° 40′ for London, the needle pointing so much west of true north. The variation is decreasing at the rate of about 9′ annually, and consequently is now somewhat less than 18° 40′ at London. At Dover it is 18° 1′; at Glasgow, 22° 48′.)

"BUILDING NEWS" DESIGNING CLUB.

"Esliessces hurried Sketches." (Your design came too late to hand. It does not meet the requirements of conditions. The wash and bake-houses are too elaborate for rural wants.)

Drawings Received.—H. P., B. B., A. W. S. Will H. Peart and A. W. Smith oblige with their addresses, so that their drawings may be returned to them?

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Correspondence.

THE KILBURN COMPETITION.

To the Editor of the Building News.

Sir,—The Royal Agricultural Society having, as one of the special features for the Kilburn Show, advertised for and obtained between sixty and seventy complete sets of designs for farm buildings of various classes, with specifications and detail estimates for each design, it would naturally be assumed that some amount at least of courtesy would have been shown the authors of such an immense amount of labour as the production of these drawings, &c., entailed. The conditions stated that four prizes of £50 each would be awarded to the authors respectively of the four best designs, and beyond the scale of dimensions to which all plans were to be drawn, and very wide latitude as to the size of the farms the buildings were supposed to be adapted for, no special instructions were given, except that all plans must be delivered at the secretary's office before 5 o'clock on Thursday previous to the opening. That the stewards were of opinion the live-stock, machinery, butter-making, and similar departments were of paramount importance when compared with farm plans was evident, as the building in which the latter were deposited was kept closed and guarded by a policeman until the fourth day of the Exhibition, when the public was admitted, but informed that "no plans were considered of sufficient merit to obtain either of the prizes offered." Now, as many exhibitors and others interested in farm buildings came long distances, with limited time at their disposal, and paid for admission on the first two days, hoping thereby to be able to examine the plans without the crush that might be expected on the days when the admission was lower, and as the executive could or should have foreseen this, common-sense dictates—that if it were impossible to exhibit the plans before Thursday, public notice should have been given to that effect. What would have been said had it been discovered on entering the show-yard, that the International butter-making or the parade of horses was not to take place, and if no information could be obtained when they would? 3. When application was made to one of the judges for some explanation, the reply was, that although the plans were all received on Thursday, they—the judges—had no instructions relative to them until Monday, the day of opening. When the Royal Agricultural Society advertised for, and obtained, 52 designs for labourers' cottages at their Cardiff show in 1872—in the same manner as plans were obtained for the Kilburn show in 1879—viz., by offering money prizes for the best, and afterwards, still in the like way, awarded none—a correspondent of a London paper suggested that surely out of 52 designs one possessed a well-distributed plan; and this remark may well apply to the present collection of farmstead designs, which, taken as a whole, is no doubt the best ever brought together. Many show sound practical knowledge of modern farmstead requirements, and their authors deserve better treatment at the hands of a "Royal Society." An agricultural implement or machine is worth as much after it is removed from the show-yard as when it entered; but with architectural plans it is different. They are prepared specially for the purpose, and practically speaking, are worthless after their purpose is served. The report of the judges states that, "although, as a whole, they display much architectural power, and in many instances considerable practical knowledge of farming requirements, there are no plans that combine superior arrangement of details with that economy of cost which is essential." Now, in the limited time allowed for judging, no attempt could possibly be made to check the accuracy of quantities, and therefore the designer's estimates must be taken as correct, and these would appear to be well within the amounts usually expended on farm buildings of a corresponding size, and erected in a substantial manner with best materials and workmanship; in fact, many landowners would undoubtedly be only too glad to get buildings erected, similar in design to some of those exhibited, for the sums they are estimated to cost. One of the judges, in his book on the "Farmsteads of England," says that, "Farms of between 200 and 500 acres of mixed or dairy husbandry will require an outlay in house and homestead of £7 per acre, but £10 per acre have been profitably expended on the house and buildings of a farm." Now, by deducting £2 per acre for the house, this would leave at the lowest calculation £2,500 as the actual necessary cost of the buildings suitable for a dairy or mixed farm of 500 acres, and scarcely any of the estimates exceeded this calculation. Under all circumstances, considering the dissatisfaction caused by the delay in exhibiting the plans to the public, and by the judges' remarks and decision, I would suggest the Council of the Society should allow the whole of the designs to be again shown in competition at the Smithfield Christmas show, under new mottoes, the judges to be men of experience in the cultivation of farms of the size and description specified in each class, and who should judge in that class only, and be assisted by some one with a sound, practical knowledge of construction, details, and cost as far as the erection of farmsteads are concerned.—I am, &c.,

A Competitor.

Sir,—Will you allow me, through your columns, to say a few words in reference to the prizes offered by the Royal Agricultural Society at Kilburn for plans of farm buildings.

Prizes were offered for four classes, the only conditions for which were—scale, complete specification, and many bills of quantities. These were fully complied with by nearly the whole of the competitors; and the judges, in their report, while saying that "many of the plans display much architectural power and knowledge of farm requirements," yet on the plea "of not combining superior arrangement of detail with economy of cost," withhold the prizes entirely.

Is this justice? Can it be that out of 68 sets of plans there were none any good? My impression is, that if prizes were offered and competed for, all conditions being fulfilled, the judges were bound to award them to the best exhibited, even though they fell short of the architectural powers of the judges themselves.

Why should so many spend their time in *what* by the issue has proved unavailing labour, from the decision of three who may or may not be competent judges?

I would not thus trespass on your valuable space, but the time allowed for protest against the decision was so short as to render it impossible to one living in the country.—I am, &c.,

No. 17.

DEVONPORT TOWN HALL.

Sir,—Perhaps the inclosed* (cut out of a Plymouth paper) may interest some of your readers.

We were among the unsuccessful, and the reason is quite plain now the matter is settled.

The amount to be expended was £10,000, and the utmost care in regard to economy was necessary, in order to do the work required in instructions. However, we managed to make a plan, for which we got a *boná fide* estimate for £10,800, which we could have easily reduced to £10,000, but time would not permit us to do so.

Our drawings were returned with thanks.

Honesty, honesty!—has that estimable virtue become un-English, or is it incompatible with the glorious art of architecture?—We are, &c.,

John Henry Tarring and Pogson.

The last home mail brings news that Mr. W. H. Hudson, the Engineer in Chief to the Cochin and Travancore Railway (formerly on the engineers' staff, G.N.R., England) is busily engaged getting up the surveys, estimates, and statistics connected therewith. The Cochin and Travancore Governments have already promised to subscribe capital to the amount of £70,000. It is expected that shortly the project will be brought before the English public. The line will be a guaranteed one.

Our Office Table.

One of the principal features which mark the onward progress of modern metallurgy is the marvellous development of our steel manufacture, and there are not wanting indications that the value and importance of this metal will still further increase with the corresponding cheapening of production due to some recent improvements in the processes of steel-making. Among the many adaptations of steel to hardware manufactures, the most significant and practically valuable is that of applying it to the production of steel screws, a branch of manufacture now perfected and solely carried on by the Manchester Steel Screw Company, Limited, at their extensive Screw Works, Bradford Mills, near Manchester. At these works upwards of 700 different sorts of screws are made, including brass and iron screws with variously-shaped heads and adapted to every purpose. The great specialty here, however, is the "Patent Gimlet-Pointed Steel Wood Screw." The threads are all cut by a new process, and the gimlet point causes these screws to enter the hardest wood without a hole having been previously made. This is not the only advantage, though this undoubtedly gives to steel screws a preference over ordinary screws for nearly all purposes to which such articles can be applied. The Manchester Steel Screw Company use best quality Bessemer steel exclusively for the production of their patent screws, the great strength and tenacity of this material rendering the screw very difficult to bend or break. One really important consideration with users of screws is the economy of the steel over iron screws. As a matter of fact steel screws are capable of sustaining as great a strain as an iron screw two sizes larger in diameter, and as the patent steel screws are offered at the standard. list price, a saving of something like20 per cent is effected by using steel screws over iron ones.

At the Court of Common Council of the City of London yesterday (Thursday) it was decided to purchase, out of the Grain Duty Fund and under the powers of the Open Spaces Act, 1878, the open and waste lands known as Burnham Beeches and the manor of Allerd with the timber thereon. It appeared that the Corporation was desirous of purchasing the whole estate of 529 acres for £12,000, but were prevented by the provisions of the Mortmain Act. Sir Henry Peek therefore offered to purchase the freehold property and to sell the open space, consisting of 374 acres at £6,000, the timber to be taken by valuation, probably at a cost of about £2,700 and certain roads to be made across the open space, the cost to be settled by arbitration. The conditions of purchase were gone into in detail, some of the members complaining of the distance and inaccessibility of the district, but eventually the proposition was agreed to *nem. con.*, and, thanks to the public spirit of the corporation, the magnificent beeches of Burnham, with some of which we are made familiar in every Academy exhibition, will be preserved to us.

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* The cutting sent is substantially the same as appears on another page under "Competitions."—Ed. B.N.

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THE BUILDING NEWS.

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LONDON, FRIDAY, JULY 18, 1879.

THE DECORATION OF THE DOME OF ST. PAUL'S.

MR. R. POPPLEWELL PULLAN and Mr. Charles Heath Wilson have, as we recently stated, suggested a design for the decoration of the cupola of St. Paul's Cathedral, to which we desire to draw the attention of our readers. The design submitted by these gentlemen is one that commends itself to the Dean and Chapter and the Committee now engaged in that work, chiefly on the ground that it shows the true relation which a monumental painting should bear to the cathedral, but as well because it certainly presents a more moderate and harmonised scheme of figures and colour than anything yet brought forward. The authors speak with authority upon a question which has engaged a considerable portion of their lives. They have studied the most celebrated decorative and monumental works in Italy and elsewhere, and have brought to their task a more than ordinary amount of discernment and taste. They say "The design which we exhibit is an attempt—under the guidance of the works of the old masters, who, at different periods, have exemplified the true nature of monumental art—to illustrate the character of this highest branch of design, in composition, colour, chiaroscuro, and such linear or aërial perspective as may be admissible under its conditions." The authors also truly remark the figures must be the most important features, and occupy the largest space in any scheme, and should be designed by an artist of the highest order, able to give them perfect form, religious expression, and sublimity and grace. The principles laid down by the authors of this design we thoroughly approve, and have all along insisted upon. The essentially monumental character of the work should be distinctly recognised at the beginning; the composition, though divided, should form one united picture, and the outline of the groups be comprised within simple forms. Any attempt at the picturesque would be a violation, and the authors instance the frescoes by Paul Veronese in the Villa Mazer, which, though fascinating, are best avoided. Based on the principles we have alluded to, the authors have produced a design really worthy of the cupola of St. Paul's Cathedral. The circumference of the dome is divided into eight equal parts by wide panelled ribs, or rather pilasters, richly decorated with folial ornament in bas-relief. These ribs spring from thrones, in each of which is a seated figure representing a prophet, to such a scale that if erect it would be 18ft. in height. The thrones themselves are plain, classical, pedestal-like compositions, and form a pleasing transition between the architectural lines of the base or drum of dome. Figures of angels, as symbolising the union of the prophetic and the spiritual world, are shown upon the thrones with extended wings, and hands pointing heavenward. The ribs or pilasters diminish as they ascend, as well as meet towards the aperture of the dome, and are crowned with foliated capitals, which carry an arcade, in the tympana of which are winged cherubs and other decorations. The authors, speaking of this part of the design, observe, "We contemplate brilliant gold grounds to contrast with the azure beneath, embellished with heads of angelic beings, and in the summit of the lantern, as apex of the design, the Lamb, as usually represented in Christian iconography." So far then for the ribs and lantern. The spherical surfaces between are divided into three nearly equal zones in height; the lower is a light background, representing a podium or basement, with a group of figures representative of "The noble army of martyrs"; above is a corridor or colonnade, having a pedimented throne or baldachino in the centre, showing a seated apostle, the other intercolumnar spaces being filled with figures of martyrs; while the upper zone, which occupies the remaining space below the foliated stringcourse connecting the ribs, is proposed to be coloured an azure, becoming paler as it ascends, filled with ranks of angels illustrating the words—

> "To Thee all angels cry aloud."

The conception has been worked out with considerable taste. A careful gradation is maintained, the darker figures being placed below, and the lighter above, the ranks of martyrs and angels as they ascend, becoming not only smaller but lighter, in obedience to a law of aërial perspective. Even the ribs are graduated in tone as they rise, while the whole of the upper surface is of pure azure, which, as it ascends, "melts into pure white." The conception strikes us for its extreme simplicity of arrangement and happy gradation; the dome will thus in its lower zone have a massive architectural composition running round, connecting the ribs, and forming, as it were, a link between the tambour and the upper azure, with the angelic host graduated in regular series and distance. The authors observe, "The Court of Heaven, as described in that grand triumphal hymn, the 'Te Deum,' appears to us to offer subjects which individually are graphic, appropriate, and impressive, and which, when united, may be brought effectually within the strict conditions of decorative art in its highest sense, presenting also pleasing images only, and free from all of a monstrous nature, which however frequent in Mediæval art, are unsuited to present taste." This sentiment will be fully endorsed, we are sure, by all who consider the ends of architectural decoration as applied to modern churches. The expression of prayer, praise, and thanksgiving have been the subjects chosen by the artists of this design, who have seized the modern spirit and have avoided the Mediæval monstrosities in their objective reality; hence angels, apostles, prophets, and martyrs are exclusively introduced. "Other noble schemes," the authors say, "present themselves, such as the verse, 'The Holy Church throughout all the world doth acknowledge Thee,' and it is proposed that the drum of the dome below the windows should have processional figures of various periods and costumes typical of this verse."

Some very able remarks are added in the author's description, to which we may briefly refer, in exemplification of the principles advocated. They throw out the consideration that the direction and execution of the work should be under one leading mind, and they very truly recall to mind how necessary to complete success this undivided mind has been proved to be in the history of every great scheme of the kind. The resemblance true monumental painting bears to sculpture when united to architecture is pointed out as essential, and the authors prove that the *rationale* of their design has been controlled by such a consideration, and the unity of conception in the eight compartments of the dome has been attained by the encircling corridor and rows of figures, and by the adoption of one colour of background. It is very truly said that any series of subjects containing unequal numbers of figures with different backgrounds and accessories would destroy all unity, and substitute a succession of disconnected pictures. In this order and unity of arrangement the design before us is supported by some of the greatest works, as the vault of the Sixtine Chapel, where, as the writers say, Michael Angelo has shown how compatible fixed general forms are with variety of design in the separate figures. We quote, however, in justice a passage here: "In thus alluding to his work as an example we do not point to or advocate any imitation of his manner or of his '*terribile*,' still less of his ideas of religious expression—all such attempts have invariably failed. It is only to principles adhered to by all the great masters, and nobly illustrated in his practice, that we draw especial attention in contradistinction to those prevalent at a later period, and too common now. We have preferred the simplest profiles of comprehensive form. Thus the chief groups are bounded by parallelograms, because they appear to us to be most in union with true grandeur of design; but to prevent this parallelism from degenerating into stiffness or monotony, and to serve as contrasts, the groups of angels have been arranged on curves of various sections." Speaking of "Chiaroscuro," the authors show the value of the dividing ribs being forcible in their effect of chiaroscuro and tone, so as to contrast with the brilliant spaces between the abodes of "light eternal." Picturesque contrasts of light and shade and other accidental effects have been properly avoided, and relief is obtained rather by contrasts of colour than of shade. A clear bright colour, with the shadows represented by local colour in all its purity, the gradations being obtained by the addition of white, is recommended in accordance with the Tuscan method of treatment, and as suitable for mosaic. A balance of colour is insisted upon, so that the same colours may recur at measured intervals, "like rhymes in poetry," in the horizontal zones. These remarks, and others on perspective, we heartily commend to the careful consideration of those entrusted with the execution of the contemplated design, whatever it may be. As regards the windows, the authors protest against brilliantly-coloured windows, which would make any scheme of mosaic or colour decoration suffer by contrast, but think a certain amount of coloured decoration necessary to associate and harmonise; and the adoption of the style developed in the school of Raphael, and exemplified in the windows of the Laurentian Library at Florence, is suggested.

One word of comparison of Messrs. Pullan and Wilson's scheme with that adopted by the committee. In the latter—based on the late Mr. Stevens's model (described in the BUILDING NEWS, p. 50, Vol. XXXV.), and which accords in its main outlines with Mr. Oldfield's scheme—the spaces between the ribs are filled with circles containing subjects from the Apocalypse. These are intended to be varied in each compartment. Colossal figures on thrones and in the ribs are also proposed. Excellent as the design may be, it must be confessed that it hardly carries through the architectonic or monumental conception, while, as pointed out by Mr. J. P. Seddon some time ago, the successive series of circular panels, if not accurately adjusted, will appear as distorted ovals upon the curved surface of the dome. It will be admitted also that the treatment is one of compartments, not a united scheme, but there is nothing to connect the parts in one whole. In the suggested idea the domical surface is treated as one great sphere, the ribs becoming a structural framework springing from an architectural base, while the gradation of colour and tone will correct any crushing effect due to colouring and detail upon the upper surface.

If the Committee persist in their present idea of decorating the dome and leaving the rest of the cathedral desolate, they cannot do better than give careful consideration to Messrs. Pullan and Wilson's scheme. What they ought to do is to go in boldly for the adoption thereof, together with Mr. Street's proposal for utilising the space beneath the dome, described long ago in these pages, and undoubtedly the most sensible and practical of the many schemes suggested in connection with the completion of the cathedral. If the public saw that the Committee had made up their minds to work on something like a complete and harmonious plan, we are persuaded the necessary means would be forthcoming. Up to the present support has rather been alienated than invited by the action hitherto taken.

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THE CITY OF LONDON SCHOOLS COMPETITION.

THE competitors in this tedious and ill-managed competition have had this week an opportunity offered them of examining the designs that have been placed first by the Committee; but owing to the unusual procedure adopted of asking permission of the authors of designs for their exhibition some of the competitors have thought fit to withdraw their plans rather than submit them to the ordeal of public criticism under what they probably conceive to be adverse circumstances. Why the three selected designs should have been taken to the Guildhall and there hung up so high that few people can distinguish the apartments, while the remainder should have been left in the empty warehouse in Aldermanbury, we cannot imagine; the proceeding was at least rather an uncourteous one to the majority of the competitors; and we cannot be surprised that a few resented the action, and considered that if their designs were not worthy to be placed in the company of the three they had better be removed. The consequence of this clumsy mode of exhibition is that the warehouse in Aldermanbury presents a pitiable example of wasted labour, half the screens having been stripped, and the remainder of the drawings hung in all conceivable corners.

We now proceed to describe a few other designs, of which we made notes last week, but which the short time at our command prevented us from noticing. It is rather remarkable that so many of the competitors should have planned their buildings with a central hall and surrounding class-rooms, though, probably, this mode of distribution offered some advantages, especially compactness and good classification. In a great number of instances, however, it has much interfered with the preservation of old lights on the west side of Keyser's Hotel, while in other cases the lighting of the corridors surrounding the hall has been subordinated to the idea of compactness and symmetry of arrangement, to say nothing of the idea of a central hall—a *sine qua non* of the grouping. While we have the assembly hall placed in a variety of positions—lengthwise with the site, transversely with it, in some cases at the back, and generally in the centre forming a kernel to the surrounding class-rooms—very few have thought of making the hall the principal feature towards the Embankment, a mode of arrangement that manifestly presents some architectural advantages. Those who have adopted this principle, as in "Live and Learn," have made the hall flank the front, either recessing it as in that case, or making it form a portion of the façade; others have placed the hall on the east or west sides, the gable end being made a part of the elevation. In the latter case the hall might be made to present a conspicuous feature in the grouping, though in the centre and front it would present an imposing mass, expressive of the public character of the building. As the principal apartment, there is an æsthetic reason for giving it prominence.

"Central Hall" is a design in a Renaissance style, and is distinguished by the ingenious way in which its author has grouped and lighted his hall and corridors. The hall has its end to the front, and is axial, while the other blocks are arranged so as to inclose two open areas, one on each side of the hall, from which the hall as well as the main portions of lateral corridors receive their light. A similar disposition has been shown by "Compactness." It is, in fact, a quadrangle crossed by the lecture-hall. The arrangement as regards entrance in the former is clever, though perhaps insufficient. The hall on first floor is entered at the sides in front and at the rear, by a back cross corridor, which would be mainly used by the students, so that confusion would be prevented. The kitchen apartments are less happily placed—they occupy the north end of the west wing, the dining-room being on the first floor. On the east side, making a corresponding block, is the lecture-room in communication with the laboratory and chemical class-rooms, which occupy this wing. Some of the class-rooms are along the front, others in the west wing, where the head-master is also located. The elevation is effective, designed with considerable freedom; but is spoilt by the four-storied block or end of wing on the west side, which ill balances the other. We consider this design one of the best, and its plan has the germ of a good arrangement, leaving a large area for playground. "Veritas" has the axis of hall east and west, with a surrounding corridor, the class-rooms are ranged in a long west block and on the north side, but there is a wasteful distribution of apartments. The author adopts a kind of Elizabethan; the front elevation is crowned by a cupola in the centre and angle turrets, while there is an arcaded treatment of the façade on the first floor. A few clever ink sketches accompany this set of drawings. One shows an elaborate Elizabethan entrance and another the hall. "Quadrangle" is one of the few which place the large hall in the rear, entered from the first floor. There is a large front hall and staircase; the class-rooms are not easily accessible from the hall, and are disposed in a manner uneconomical as regards supervision. Classic has been adopted, the elevation to the Embankment having a centre dome. Another set of plans under this motto shows the hall on the east side with open court in centre and a Late Gothic elevation, but without any special merit to claim notice. "Gamaliel" has utilised space by placing his hall with its axis in an east and west direction in the centre, the corridors surround it, and there are some good points in the planning. The front is treated with considerable taste in Late Gothic, some of the features bordering on Renaissance, Scottish in feeling. A very remarkable design with a motto "Perseverantia Omnia Vincit" exhibits a façade inspired by an Italian palace not unlike the Farnese. The hall is placed in front, but the arrangement is not so well thought out as some others. The plan of "Compactness" (noticed last week) is better balanced, and the side areas afford good means of lighting the corridors. An elaborate set of drawings, under the motto "Y. Z." with a note of interrogation, cannot be passed over. The plan is irregular, the hall being placed on the east, the class-rooms forming a lengthened block on the west front. It fails in the essentials of grouping and good disposition of apartments. The front elevation is treated in Gothic of an essentially prosaic kind, but a cleverly drawn large interior view of the hall exhibits a sensible treatment, and shows a gallery surrounding the interior on three sides with a flat-pitched Late Gothic roof and good detail. "Q. E. D.," like one or two others, has a semicircular hall in the centre lighted by open areas at the angles on north side; the dining hall is placed in front. Much as we may approve this plan for classification, it is scarcely one that commends itself for such a scheme as this. Design is in Renaissance, but not well balanced. "A. Z." curiously inverts the semicircle, and a block of class-rooms forms a straight boundary on the north side with a peculiar arrangement of radiating staircases connecting the administrative block in front with open area between. The design is certainly more ingenious than desirable. "John Carpenter, Founder," is the motto of a Renaissance set of drawings with a large lightly-coloured interior perspective of the hall, but the façade towards the river is air-drawn and visionary in the centre; the hall is placed centrally with the lecture theatre in front, and the plan shows a large octagon vestibule. "Blenheim" also Renaissance, adopts the transverse position of hall, but it is placed in front, while a long block of class-rooms are on the east and west sides. The eastern block is kept of one story, so as not to interfere with the lighting of hotel. At the back is a playground 137 feet by 122 feet. The side elevation is very broken; the front is better. "Sunshine" has some clever elevations conceived in a Gothic style, but the plan is hopelessly confused. We may also note a design with a star remarkable by the attenuated and mullion windows and corner turrets in Late Gothic; and "Thorough" with a front hall arrangement but without any special feature to call for remark; "London" in a similar style with a central hall. One of the most creditable performances in Gothic is unquestionably "North Lights." We noticed the chief points of its plan last week, but the square centre tower with octagon lantern termination, the collegiate character and good massing of the composition on its two main fronts, place it high both as a drawing and a design, and we are sorry the author has removed it from the collection.

Now the competing architects and the public have all the designs before them, we may expect to hear a great many opinions expressed about the three favoured designs. We have already declared our belief that the first design has fairly won its position, though to a certain extent imperfect in detail. Some objections have been raised to the plan: for instance, that the playground and gymnasium have been made the leading features, to the detriment of the building; that it is not economical in its distribution of apartments: that the students have to traverse the administrative to and from the dining-room, that the latrines are not well placed, &c. The strongest of these objections, to our minds, is the need of a better and more direct entrance to the dining-hall, instead of the pupils having to pass the administrative offices and public entrance every time they go to dine. The dining-hall is on the ground floor, and occupies the east wing, which is kept low, and is thus removed from the teaching block entirely. If a connecting corridor had been arranged on the north side of the gymnasium, this objection would have been obviated, and a separate entrance for the pupils obtained. One of the strong points of the plan is undoubtedly the separation of the class-rooms from the other parts and their position on the west side; the rooms are "kept together," and this position seems in every respect to be well adapted for teaching requirements; the arrangement of the staircases is convenient for the hall and playground. A cubic allowance of 200 cubic feet per boy has been given, and the cloak lobbies are screened off yet under control. Another essential point is the covered playground area, which, instead of encroaching, has been made a centre of light and air in the planning of the gymnasium, and in this respect conditions G and H have been complied with. Thisarea is at least three-fourths of the site.

As regards the great hall, the area required, about 5,000 super. feet, has been obtained with a pleasing proportion, and is made as it should be, a central and dominant feature in the main elevation. The authors have taken into account the difficulty of lighting; the necessity of preserving the hotel lights, and their general plan, appears to be a well thought-out disposition of the main departments upon the site chosen. The two frontages of most account have been utilised by the main blocks, and the less lighted and inclosed boundaries treated as those of the playground. Of the two other designs, "Playgrounds" and "Simplicity," we cannot speak with so much confidence, and it would need more space than we can afford here to weigh carefully their respective merits. Relatively, too, we may question their position with respect to other designs we have named, and which go unrewarded.

The open quadrangle arrangement with its cloisters, as shown in "Simplicity," is a capital feature in a large unobstructed area of ground, but in such a position as the one selected, hemmed in between a roadway and an hotel, we are not disposed to favour it. There is much ability shown in the plan *per se*, in the groups of class-rooms, and the prominent position of hall, which is 100ft. by 50ft., and occupies a prominent position along the Embankment façade. On the other hand, the details of the plan admit of improvement; the secretary's office is apparently lighted only by borrowed lights, and appears to be a room within the hall itself; the latter is large, and not central; the hats and cloaks arranged in the four corners of quadrangle are scarcely close enough to some of the class-rooms. Referring to the condition as to playground, the plan does not show more than about one-third of the area of site devoted to that purpose, or about half that given by "Live and Learn" and "Playground." With respect to elevation, a Gothic of a French type has been selected; there is a rather depressed entrance under the central oriel, and a too bulky flèche to hall, which has octagon turrets at the angles and a steep roof. The side elevation is broken by the class-room blocks. "Playgrounds" not only gives more area to to playground, double that of the last, but places his block of buildings at least 50 feet distant from the Hotel—a decidedly important point. The plan is a parallelogram, the hall on ground floor being central, but placed behind, and obtains its light partially through a large window at the north end. In front of it and occupying a large space is the entrance hall and main staircase, which forms an important feature in this design. One obvious advantage of this double hall arrangement is the separation of the public and administrative entrances from the class-rooms, which are on both sides of assembly hall and are accessible from their own corridors. The hall has numerous entrances on both sides, besides the front end; its walls, forming in fact a series of piers and openings, which, on the first floor is made an arcade. The hall is lighted from a clerestory, and has a gallery round it; the upper class-rooms are lighted by skylights. The chemical class-rooms *en suite* on the first floor occupy the east side of the Embankment front, the dining-hall the south-east corner, and the lecture-hall extends two stories in height. French Renaissance of an Early character has been employed. The front façade has a high roof with a centre square entrance tower, and is relieved by side dormer gables of elaborate design. There is a want of balance in the features, and the windows of the chemical rooms scarcely group themselves pleasingly in the front. Generally, the author has displayed some discrimination in emphasising the several blocks; and the detail, though rather feeble, appeared to be cleverly drawn, if we can trust our eyesight at the height the elevations are hung. Whichever design is carried into execution, we hope the author of it will be employed, and that officialism may not be allowed to spoil that which it could not produce.

STRENGTH OF TIMBER.

THE extensive use of iron of late years in forming the main beams of ships and buildings has caused the engineer and builder to look upon timber as a comparatively base material, so that much less attention is paid to its qualities as a building material than in former times when all the beams in a ship or building were made of it.

As, however, timber is still very much used in the ordinary class of structures on account of its lightness, adaptability and general convenience, the consideration of its power of resistance to strains may not be without interest to a large number of our readers.

When timber balks are employed in forming girders or bressummers, they have a tendency to twist as they get old and dry, so as often to affect the safety of the building. This can be prevented by the simple process of sawing the balk down the middle longitudinally, reversing the halves and then bolting them together, so that any tendency to twist one way will be counteracted by a similar tendency in the opposite direction. As timbers are not generally of equal strength in all parts, the reversing process has also the effect of equalising the strength; it also enables the builder to see whether the beam is sound at heart before putting it in its place in the building.

We find by comparing different series of experiments on the strength of wood, that those which are made on beams of small scantling generally give higher results than others that are made upon whole balks; the smaller specimens experimented on being generally cut from the soundest and best qualities of wood. The strength of timber also varies according to the moisture it contains, very wet timber being generally much weaker than that which has been thoroughly seasoned; if, however, the drying process is carried too far, the strength may be impaired, the wood becoming brittle and liable to snap across when subjected to any sudden strain; as was the case with a girder carrying the floor of a school-room in Westminster, which broke with a load that a sound beam would have borne with perfect safety, the wood having become dry and brittle from the heat to which it had been subjected.

In deducing the formulæ for the strength of beams, certain assumptions have to be made at the outset which are too often lost sight of in their practical application by the architect and engineer. In the first place, it is assumed that the resistances to extension and compression are proportional to the stretching and compressing forces exerted on the beam, and that the neutral axis of any section passes through its centre of gravity. In the second place, the mathematical theory is based on the assumption that the strains to which the beam is subjected are not great enough to cause injury to the elasticity of the fibres, so that if bent by the pressure of a load the beam will return to its original shape as soon as that load is removed, and no permanent deflexion or set will be produced. Under these assumptions it has been demonstrated by mathematicians that, when a beam of rectangular section is fixed at one end into a wall and strained by a load applied at the other end, within the limits of elasticity, the moment of the resistance (M) at any section is directly proportional to the moment of inertia (I) of that section about its central axis, and inversely as the distance of the centre from the top or bottom edge of the section. Now the value of I for a rectangular section is $\frac{1}{12} b\, d^3$, where b and d are its breadth and depth; and the distance of the top or bottom edge from the centre is $\frac{1}{2}\, d$; consequently we have for the value of the moment of resistance,

$$M = C \times \frac{\frac{1}{12} b.\, d^3}{\frac{1}{2} d} = C \times \frac{b.d^2}{6},$$

C being a constant determined by experiment for each kind of timber.

Now, the moment (M) of the strain of a load at W acting at the outer end of the beam upon the section next the wall, where L is the length of the beam, is M = W × L, and by the laws of mechanics this moment must be equal to the moment of resistance, or

$$W \times L = C \times \frac{b.d^2}{6}, \therefore W = C\,\frac{b.d^2}{6L}$$

When the load W is uniformly distributed over the length of the beam, it can be demonstrated that the strain is reduced one-half, or

$$\frac{W}{2} L = C \times \frac{bd^2}{6}, \therefore W = C \times \frac{bd^2}{3L}.$$

The most important cases however of loading are where the beam is supported at *each* end, and loaded either in the middle, or at several points in its length, or equally over the whole length. When W is at the middle point of the beam the leverage is one-fourth that of the load when placed at one end, so that the equation becomes

$$\frac{W}{4} L = C\,\frac{bd^2}{6}; \therefore W = \frac{2}{3} C\,\frac{bd^2}{L}.$$

When the load is equally distributed along the beam from end to end, the leverage is half the above, or

$$\frac{W}{8} L = C\,\frac{bd^2}{6}, \therefore W = \frac{4}{3} C\,\frac{bd^2}{L}.$$

Framed floors generally have the binders framed into the girders at distances apart of from 4ft. to 6ft., so that the strain comes upon the girder at two or more points. When these points are equidistant so as to divide the beam into equal bays, and the load w is the same at each point, we have for two points of loading the moment of the strain at the centre of the beam

$$\frac{w}{3} L = C\,\frac{b\,d^2}{6},$$

or if $2\,w = W$, the entire load, $W = C\,\frac{b\,d^2}{L}$

When there is a load w at each of three equidistant points, the moment at the centre is

$$\frac{w}{2} L = C\,\frac{b\,d^2}{6}$$

or if $3\,w = W$, the total load, we have

$$W = C\,\frac{b\,d^2}{L}$$

When there is a load w at each of four equidistant points, we find the moment of strain at the centre

$$\frac{3}{5}\,w\,.\,L = C\,\frac{b\,d^2}{6}$$

and since the entire load W is $4\,w$, we have

$$W = \frac{10}{9}\,C\,\frac{b\,d^2}{L}$$

When the load is distributed over a larger number of points than four, the strain at the centre will be practically very nearly the same as in the uniformly distributed load.

The values of the quantity C have to be determined by experiments on specimens of the various kinds of wood, and as these are usually fixed at each end and loaded at the centre, we shall simplify the formulæ by putting S for $\frac{2}{3}$ C, so that the formula for a beam loaded in the middle becomes

$$W = S\,\frac{b.\,d^2}{L}$$

the breadth and depth being taken in inches and the length L in feet. the values of the multiplier S, as given in the table below, will enable us to find the *safe permanent load* W in lbs., which can be laid on the centre of any beam. The values of S in the table have been chiefly determined from the experiments made on beams 2″ × 2″, and 7ft. long at H.M.'s dockyards, and recorded in Laslett's "Treatise on Timber and Timber-trees." The actual breaking load is there given, but we have here taken one-sixth of that weight as the *safe load*, and determine S from the equation

$$S = \frac{W \, . \, L}{b\,d^2}$$

The average breaking weight of specimens of English oak was 806lb., and taking W as one-sixth of this or 134lb., we have

$$S = \frac{134 \times 7}{2 \times 4} = 117$$

In the same way the values of S for the other kinds of wood were determined as given in the table, but the specimens having been of small scantling and carefully selected, their resistance is probably considerably greater than is found in the general average of beams such as are commonly used in buildings; the allowance of one-sixth the breaking weight as the safe load will not therefore be found too much to make in practice.

The formulæ for the *safe permanent load* W in lbs., on a beam of length L in feet, and having a breadth b and depth d in inches, will be as follows, according to the mode in which the load is applied to the beam;

Beam fixed at *one* end and loaded at the other,

$$W = S\frac{b\,d^2}{4\,L}$$

Beam fixed at *one* end and loaded with a weight uniformly distributed over its entire length,

$$W = S\frac{b\,d^2}{2\,L}$$

Beam supported at *each* end and loaded at the centre,

$$W = S\frac{b\,d^2}{L}$$

Beam supported at each end and loaded uniformly over its whole length,

$$W = 2\,S\frac{b\,d^2}{L}$$

Beam supported at each end and loaded at two points equidistant, each load being ½ W,

$$W = \frac{3}{2}\,S\frac{b\,d^2}{L}$$

Beam supported at each end and loaded at three points with a weight ⅓ W at each,

$$W = \frac{3}{2}\,S\frac{b\,d^2}{L}$$

Beam supported at each end and loaded at four points with ¼ W at each point,

$$W = \frac{5}{3}\,S\frac{b\,d^2}{L}$$

The resistance of beams to flexure follows a very different law to that of resistance to fracture, it being ascertained from theoretical considerations and by the principles of mechanics that as long as the *elasticity* of the fibres remains *unimpaired* by the strain applied, the deflexion caused by a load placed at the centre of the beam is directly proportional to the amount of the load, and the cube of the length of the beam, and is inversely as the breadth and the cube of the depth. Putting E to represent the quantity called the modulus of elasticity, we have the deflexion:

$$\delta = \frac{W \, . \, L^3}{E \, . \, bd^3}$$

the value of E is determined by observing the deflexion produced by a given weight W, for

$$E = \frac{W \, . \, L^3}{\delta \, . \, bd^3}$$

In a series of experiments on beams of English oak 2″ × 2″, and 7ft. long, with a load of 390lb. at the centre; the average deflexion was 2½in., a permanent set of $\frac{1}{6}$in. being produced; putting 2½ for δ in the equation, we find E = 3,344 when b and d are in inches, and L in feet. In the same way the values of E for other kinds of timber are calculated as shown in the table at end, so that we can calculate the probable deflexion that will be produced by a load W in lbs. at the centre of the beam supported at each end, for any of the materials named, by means of the formula:

$$\text{Deflexion at middle} = \frac{W \, . \, L^3}{E \, . \, bd^3}$$

If the load is distributed uniformly over the whole length of the beam, it can be proved mathematically that the deflexion is five-eighths of that produced by the weight all at the centre.

When it is required to ascertain the safe load to be placed on a beam, the maximum amount of deflection should be fixed, and then the weight (W) which will produce that deflexion will be the one that can be used with safety, and can be at once calculated from the equation

$$W = \frac{E \, . \, \delta \, . \, b\,d^3}{L^3}$$

the value of E being that given in the table below, W will be found in lbs., the length being in feet, and all other dimensions in inches.

A flitch-girder is a balk of timber sawn down the middle longitudinally, and the two parts or flitches reversed and bolted together with a plate of rolled iron placed between them of the same depth as the wood; by this means the resistance to deflexion is just doubled if the thickness of the plate is to that of the timber inversely as the values of E for iron and wood; and since the value of E for iron is about 20 times that for fir, the thickness of the plate should be 1-20th of the wood in order that each material may develop its full power of resistance to flexure, and the deflexion produced in the flitch-girder by a given load will be one-half that of the wooden balk without the iron plate.

Timber when used in the construction of framing is sometimes kept in a constant state of tension by a force which tends to pull asunder the fibres longitudinally, as is the case with tie-beams, collar-beams, braces, &c. In the table below will be found the ultimate tensile strength (T) of different kinds of wood, or the force which is required to tear asunder a piece of wood having one square inch of section when applied in the direction of the length of the fibres; but, in practice, no beam ought ever to be subjected to a greater strain than 1-10th of its ultimate strength. The tensile strength of any piece of wood will be found by multiplying its sectional area in inches by the value of T.

It also frequently happens that timber is subjected to a crushing force acting in the direction of the fibres, and tending to shorten the piece, as in pillars, story-posts, struts, shores, &c. When the length of the pillar is much greater than the diameter, it will have a tendency to bend before the load is sufficient to crush its fibres. If the length is 25 diameters and upwards, the strength is directly proportional to the fourth power of the diameter, and inversely as the square of the length; that is to say, if d is the diameter or side in inches of a square pillar, L the length in feet, the breaking weight in tons is

$$W = \frac{Kd^4}{L^2}$$

where K = 11 for English oak, and K = 7 for Riga fir.

For pillars between 10 and 25 diameters in length, the strength can be found by first calculating W as in the last formula, and multiplying it by the crushing strength of the section divided by the sum of W and ¾ths of the crushing strength of the section. That is, if C is the crushing strength per square inch of section, as given in the table below, a the area of the section in inches, the breaking weight W′ of the pillar will be

$$W' = \frac{W \times C \times a}{W + \frac{3}{4}\,C \, . \, a}$$

In the case of short pillars, the resistance to crushing comes into full play; nevertheless experiments have shown that the shortest pieces, such as cubes, are not always the strongest, the greatest resistance being generally exhibited when the length is to the area of section in the proportion of 5 to 4. Thus a square pillar 6in. square, having a section area of 36in., will bear the greatest load when its length is 45in., or 3ft. 9in.; and a pillar 12in. square, having a section of 144 in., should be 180in., or 15ft. long. From this rule we can find the diameter or side of square (s) of a pillar whose length in inches is l; for $4 \times l = 5 \times s^2$, gives $s = \sqrt{\frac{4}{5}\,l}$. This is, however, only an approximation, and is taken from an average of several experiments.

TABLE OF VALUES OF CONSTANTS.

	S	E	T	C
			Lbs.	Tons.
English Oak ..	117	3344	7571	3·56
Dantzic do. ..	70	1672	4217	3 to 3·77
American white do. ..	117	4357	7021	2 to 3
Baltimore red do.	105	5573	3832	2·63
Dantzic fir ..	128	3476 to 5145	3231	3·44
Riga do... ..	87	6472	4051	2·2 to 3·3
Canada Spruce	98	6823	3934	2·2
Do. red pine ..	95	6271	2705	2·1
Do. yellow do.	91	3935	2027	1·43 to 2·5
American pitch pine	129	5016 to 6432	4666	2·88

A PNEUMATIC SEWERAGE SYSTEM.

At the recent Sanitary Conference at the Society of Arts a new system for collecting and conveying sewage by means of compressed air was introduced by Mr. Isaac Shone, C.E., present Mayor of Wrexham, to which we promised to call the attention of our readers. Many of those present, from the rather brief and imperfect explanation then given of the invention, hardly understood the process, which has been tried with much success at Wrexham, and spoken of favourably by Lieut.-Col. Jones, a gentleman who has achieved well-deserved notoriety in connection with sewage irrigation. A report of recent proceedings at Wrexham, in connection with this invention, was given in the BUILDING NEWS a fortnight since, and we now propose to examine shortly the details of the system. If we accept as one of the axiomatic principles of good sanitation the speedy removal of all sewage matter from our towns, then Mr. Shone's pneumatic system must certainly be acknowledged to be a useful mode of facilitating the discharge of such matter under certain conditions. To discuss what those conditions are, and how far the "pneumatic ejector" can be applied successfully and economically, would lead us further than we intend to go in the present remarks, and we must refer the reader to the report above mentioned. We may, however, observe briefly that, as a supplemental agency in flat districts where gravitation cannot be turned to account, where effluents from sewage have to be ejected on to land, and for lifting sewage in some cases, Mr. Shone's "Sewage Ejector" appears to us to be just the thing needed. We may generally describe the "ejector," or the main agent in Mr. Shone's plan of collecting and transporting, as an iron tank or vessel, spherical or cylindrical in shape, into which the sewage flows, and which, by a simple automatic action that alternately admits compressed air into the vessel and lets it escape, forces out the sewage, and lifts or distributes it to any level. Of course the compressed air is supplied by an air compressor or steam-engine of some sort, and this one engine can be made to work "any number of the ejectors at any distances away from the engine." Without a diagram it would be impossible to intelligibly explain to the reader the precise action—very simple when once seen; the alternate motion by means of which the compressed air enters and escapes is produced by a "cup and bell" arrangement in the centre of the vessel. "When the ejector is nearly full the liquid as it rises encounters the 'bell,' closes up its open end, and compressing the air within it, lifts it up, thereby drawing back a small slide-valve, admitting air-pressure to one, and exhausting at the other end of the automatic piston-valve, the outer ends of which act as the motive-piston, the middle portion acting as the valve regulating the inlet and exit of the compressed air." The compressed air entering, forces out through a delivery-pipe the sewage, which may then be conveyed at any height above through sealed sewers. The only question is the possible obstruction of the valves, or some defect in the cup and ball mechanism; but the simplicity of the contrivance leaves little room for such doubt, as we have no unnecessary parts such as valves, rams, or other gear creating friction and consequent wear and tear; and the ejector, we are told, has been in successful operation at Col. Jones's farm.

These "ejectors" are proposed to be placed wherever convenient under streets; for example, if a town is sewered on this system it would be divided into districts, the sizes of which would be governed by the levels; the sewer in each district would be made to gravitate to the "pneumatic ejector," and be of a size proportioned to its work, be well jointed, and thoroughly air-tight. Silicated stoneware pipes are recommended by Mr. Shone. Each collecting station would consist of an elongated cylindrical reservoir, into which the crude sewage is discharged; the floating and coarser bodies being intercepted by a diaphragm. After passing this screen the liquid would flow into the pneumatic ejector, which is placed at a lower level, so as to allow a fall into the vessel or tank. The "ejector" may be surrounded by brickwork, the chamber forming a manhole. The sealed main sewers employed constituting a second and independent series of pipes may, of course, follow any inequalities of the ground, and may be placed at any convenient depth from the surface, and discharge at the outfall direct or be led into a gravitating sewer. One advantage of the system is that all communication with street and house sewers is cut off immediately the sewage matter is ejected into the sealed mains, while the expulsion of the sewage may be varied at pleasure to any speed, so that it may be got rid of before decomposition has fully set in, or be applied to land in a comparatively fresh condition. On the other hand, it may be urged that two systems instead of one have to be laid down, namely, the gravitating sewers to the collecting stations, and another set of sealed pipes from them. Mr. Shone answers fairly the objection by observing that the sewers, if laid down upon this plan, would not require deep and costly cuttings to give them the necessary amount of fall to the ejector stations, and that they may be reduced to a minimum. Speaking at Wrexham the other day, he went into figures to prove that a pipe of 7in. diameter running full would suffice to take away the sewage of 10,000 people, though under the present unfortunate state of things the engineers are obliged, to meet the maximum rainfall, to provide a pipe of 3ft. in diameter, in which deposits take place and the generation of noxious gases follow. In short, the sewer is made large enough to provide for both sewage and rainfall, and also for the prospective population.

The pneumatic system has been introduced into Berlin, where there are half-a-dozen pumping stations, at a cost of £50,000 each. By Mr. Shone's method the cost of making each station a pumping-station can be obviated by connecting the ejector-stations with one engine station, by which the expense of attendance at each point is avoided. As it appears to us, the principal gain effected by the ejector is, such a velocity can be insured in all the pipes so as to properly cleanse them. Mr. Shone's pneumatic ejector can be applied also to the collection of the sewage of any large building, or collection of buildings, by means of which it may be delivered into any existing sewer. Country mansions, hospitals, hotels, &c., can be readily treated in this way. We understand the inventor has, at his own expense, carried out a series of practical trials with the sewage of Wrexham, to prove the propulsive power of the ejector, and the experiments have been witnessed by many professional men, who have expressed a favourable opinion of the system. In a recent trial the sewage was driven out to a height of 12 or 14ft. above the machine, and the contents was discharged in a minute and a half. The practical working of the pneumatic ejector is beyond question, and that it can be made to discharge the sewage to almost any height is equally certain. There can be no stagnation in the pipes of discharge. Directly the sewage passes into the ejectors it is expelled through them at a thoroughly cleansing velocity—a condition of immense value in the sewerage of flat districts. As regards the cost, the laying down of hermetically sealed air pipes, and the expense of the air-compressing engine and stations are the chief items as against the ordinary system; but, as we have seen, the smallness of the sewers and the saving in excavation, would in many cases leave a margin favourable to its employment. Mr. Shone said the other day at Wrexham, in alluding to the sewerage scheme of Llandudno (with a population of 5,000), which had been estimated at £40,000, that he could sewer the town effectually by his system for the sum of £15,000. There is little doubt that the large deeply-seated sewers of our towns have been a source of trouble, disease, and expense; the question of disposal has been rendered extremely difficult of attainment by them, while their ventilation has taxed the ingenuity of scientific men for years. Mr. Shone's pneumatic system, by supplying a transporting power at a moderate cost, will certainly remove these difficulties and obviate recourse to the objectionable and expensive modes of lifting.

THE ARCHITECTURAL REMAINS OF DOWN ABBEY.[*]

By J. J. Phillips.

Of all the remains of mediæval art workmanship of ecclesiastical architecture which we in the province of Ulster possess, the most extensive and complete in their chronological sequence and association, the most frequently seen, yet the most completely ignored and misunderstood, are the very fine series of sculpturing in the capitals to the piers and pier-responds and other architectural detail of the Gothic period at Downpatrick Cathedral—a structure the history of which, as time and space are very limited, we will only attempt the merest outline, and that only offered, as we proceed with the paper, by way of collateral evidence to the correctness of our theories. The present cathedral was commenced in the year 1790, and was engrafted upon the ruin. The venerable yet sturdy fabric of what in Bishop Tiberius's times (A.D. 1576) was the eastern arm of a gorgeous abbey minster full 240 feet long. It has been hitherto asserted that it was erected on the ruin of the church, but we must make a distinction, and the difference is that the modern cathedral we can show to have been built upon the choir and sanctuary of the Benedictine Abbey Church, upon what in modern church-warden's vocabulary is termed the chancel of the church. It will at once occur to you to inquire, But where is the nave of the church? Where are the transepts? Local folks will answer that their foundations and part of their walls are still under the sod in the adjacent field and garden, and are lying, for the most part, outside the precincts of the graves; and, further, there are to the north and north-west of the present church tower the foundations, and probably more than mere foundations, of the chapter house, fraterys, dormitories, and other structures incidental to one of the most important and extensive abbeys in Ireland. And these exist notwithstanding that it was the quarry whence was excavated a large proportion of the building materials with which in the last century many of the buildings in Downpatrick were erected. If we remember that the floor of the choir and sanctuary would have been the most elevated of all the floor levels in the church by a number of steps, at least three steps, more probably seven steps, or ten, or more, and when you have in the minster at Down deducted the necessary difference in levels to descend to and reach the probable level of the floor of the vanished nave, you will be inclined to believe with me that the quarry has not by any means been exhausted, more particularly when we know that part of the quarry which embraced the nave, probably with crypts, had been buried for two centuries or more in accumulation of debris and soil. We need scarcely remind you that in mediæval times it was essential that a Benedictine Abbey minster should have its nave. We exhibit the original plan of St. Werburg's Abbey, in Chester, upon the lines of which John De Courcy's monks had this of Down remodelled and enlarged. Examine the plans of any other abbey churches, and observe the ground plan almost invariably in the form of a latin cross, of course differing in proportions, but still preserving nave, transepts, choir, and sanctuary; refer to the plan of Armagh Cathedral, Christ Church, St. Patrick's, Dublin, and satisfy yourself as to their lengths and ground plans, then consult Dean Reeve's invaluable work on the antiquities of Down, and learn that the Priors of this great abbey were peers of Ireland, and possessed fully one-third of the lands of Lecale, then find the assessed values and taxation of Down Abbey in the thirteenth century, and I think you will conclude with me that the ruin 100 feet long as given by Harris, which was beautified and extended by Bishop Tiberius, and which from its eastern chapel or sanctuary to its western gable would, on the most moderate calculation, reach 240 or 250 feet long. "The Abbey," as the Protestant Cathedral of this diocese is very frequently called, contains within itself representative specimens and scraps of almost every epoch of Gothic art except "Perpendicular" works: while scattered around it upon the grass, exposed to all weathers, in a shameful state of neglect, and treated as mere *débris*, are fragments of a sculptured Celtic cross, which, as we have been informed on good authority, have been *casus belli* "to more quasi-religious shindys than any other stones of their size in Ulster;" into the fact of the possession of these now neglected stones (and of another which has since happily found a congenial resting place) there was imparted not many years ago all the intense bitterness of the odium theologicum. Surely they are as well entitled to safe sanctuary inside the church as the tombstone of Lord Cromwell. You have on the wall a rubbing of one panel of this cross which exhibits the well-known characteristics of the "opus Hibernicum." This panel, I may state, almost exactly corresponds with one of the panels of the cross of Arbee. As these Celtic crosses have been popularly associated with the pseudo grave of St. Patrick, reference to them here would suggest the vexed question of the final resting place of the remains of that venerated apostle; but we disclaim any such topic, as it is far wide of the aims of this paper: the curious on such a subject we would refer to the ample and accurate writings of Dean Reeves, as well as the more recent impartial deliverances of Dean O'Laverty on the subject. We must now direct your attention to a sketch which purports to be a view of the ruins of Down Abbey and Round Tower as they stood in 1789, the year in which Mr. Charles Lilly, the architect, made his plans and undertook the supervision of the modern erection. It appears that the original drawing of these ruins by Lilly is now in the possession of William Johnston, Esq., of Ballykilbeg. We also exhibit the lithograph of the abbey given in the "Ulster Journal of Archæology," vol. iv., page 13. From all these illustrations we may observe that the Round Tower of Down anciently stood, with reference to the abbey church, when in its prime, in a position somewhat analogous to that which the Round Tower of St. Canices, Kilkenny, occupies—*i.e.*, close to the south transept. In the autumn of 1789 this Round Tower was pulled down, an act of vandalism much to be deplored, which was the result of political jealousy. Ere we leave the subject of early Irish stone-carvings, we beg to direct your attention to this full-size drawing of a small monolith, which, fortunately for its safety, was built out of harm's way, upon the inner face of the wall over the doorway of the vestibule of this cathedral. On this stone we have sculptured an Irish cross with the bas relief of an early Irish abbot carrying his bachal and book. Observe the archaic form of this crozier, coinciding with those anciently in use in the primitive Celtic Church, the relics of some of which, preserved in the Museum of the Irish Academy, bear the appearance at a distance of fossil gas pipes, but on close inspection revealing exquisite examples of Irish interlaced work. We might have expected to have found in the vicinity of Down Abbey more frequent traces of the art workmanship of the Hiberno-Romanesque period. We must remember the growing importance at this period of the Abbey Church and the Ecclesiastical School at Dundaleathglas or Down. It is in numerous records by the Four Masters shown that since a period nearly coeval with the introduction of Christianity into Ireland this was the site whereon stood successively enlarged and beautified ecclesiastical structures. We have numerous records of invasion and pillage by the Danes, who were particularly attracted by Down. Under date 1015 Dundaleathglas was totally burned, with its daim liag (stone church) and cloictheach (round tower). Bishop Malachy the First was an earnest originator and patron of church extension schemes. The period of his episcopate (dating from 1136 to 1148) closely synchronises with the erection of Cormac's Chapel on the rock of Cashel, which is the most unique ecclesiastical edifice ever erected in Ireland, and marks the distinct and independent tendency of Irish architecture to work out a style of its own, based on Romanesque types. This Malachy (the famous Malachy O'Moirgair) made Down his headquarters, and repaired and beautified the church of that see. He already had in his church the beautified shrine, or tomb, of the relics of SS. Patrick, Bridget, and Columba. We have on record that Denard, a saintly artificer, ornamented this tomb. We have on record that the bell of the will—*i.e.*, St. Patrick's bell—was transmitted from Down to Armagh. We have most of us seen this bell of archaic type, with its exquisitely ornamented shrine. There is abundant proof in the "Annals of the Four Masters" and in St. Bernard's "Life of Malachy" to show that this enlightened churchman fostered native arts and artificers, although in his later days he craved for the introduction of Continental types of church architecture and foreign (we might say alien) forms of Church Ritual. Pity it is that we have not now in Down Abbey any of the work of St. Donard and such like devotees to that mode of Irish art which identified itself with the legends of local antiquity and the mysterious relics of an ancient faith. Now, however much we may wish to have had some vestiges of the work of Bishop Malachy the First to show in the cathedral at Down, we must say that we do not find any architectural detail evidencing features assignable to any date prior to the undoubted Early English work of John De Courcy's abbey builders, or about 1163, during the episcopate of Malachy the Third. We are aware that this statement is at variance with the suggestions of Bishop Mant, who assigns "all the sculptured work in the capitals, as well as the arch mouldings of the 'five handsome arches,' as probably belonging to the period of Malachy the First, or 1137;" but we have hereafter to show that a large proportion of this carved detail can easily be identified as the work of two centuries later—*i.e.*, the Decorated period. We have been privileged by access to Bishop Mant's original manuscript, now in the possession of Canon MacIlwaine, and we feel bound, in justice to its author, to give the exact words of its introduction, as this causes us to feel less timidity in presenting our own views and researches on the subject. He states that the "deductions which are thus hazarded in this essay are offered with considerable hesitation," and we may feel certain that their author would have amended them if spared to later days when archæological science had more opportunities of becoming exact and certain. Our identification of the architectural detail in the cathedral commences at the moulded circular abacus and unfloriated capitals, which is without doubt Early English work, and that of a very distinct type, although we have also unfloriated capitals grouping in the Decorated work in the east wall of the church. These Early English capitals occur where shown on the ground plan of the cathedral and marked No. 1, and we consider them to have been part of the earliest work of De Courcy's builders, and as Malachy the First's church would have been much too small for the large bands of monks from St. Werburgh's, in Chester, imported by De Courcy, it would have been swept away in much the same way as the native Irish clergy were turned out to make room for the new forms of art and to accommodate a new and more advanced ritual. It is our opinion, based on careful search and much thought, that there was waged on that occasion a war of extermination all down the line, or different lines, against the Irish national institutions—political, religious, architectural, and artistic—and that it was only the superstitious fears of De Courcy which saved such relics of Celtic art as were left about the shrine of St. Patrick, whom this warrior sought in every way to propitiate in his favour, as related by Camden. It is this which we attribute as being the primary reason why we have such scanty remains of the Hiberno-Romanesque period at Down Abbey—the previous plundering of the Danes being another reason. We must now direct your attention to the peculiar form of the piers on which rest the five handsome arches of the ruined Abbey church mentioned by Harris. To use Bishop Mant's description, "the form of these piers is not common: they are oblong, with the angles taken off, and are ornamented on the shorter faces—*i.e.*, on the east and west faces—with semi-circular shafts of cut stone, the capitals of which appear sculptured with figures of human heads, grotesque animals, and foliage. . . . . These piers support the five handsome arches, which may be of the same date." Now, with reference to the original form of these "oblong piers with their angles taken off," we will ask you to inspect the very beautiful clustered shafts and pier responds, north and south of the modern reredos at the eastern wall of the cathedral, of which you have photos here as well as sketches. We look to the form of these responds and clustered shafts for the key to the original form of the north and south faces of the pier, which now, instead of such clustered shafts, present chamfered angles with Queen Anne string moulding at the level of the abacus. Doubtless, the architect Lilly was under the necessity of chamfering the angles or reconstructing the piers to the form in which we now have them, for we may easily understand that the angle shafts on these piers would have horribly suffered during the inconoclastic period which ensued between A.D. 1533 (when Leonard Lord Gray, having burnt the Cathedral at Down, converted it into a stable) and the year 1790, at which date Lilly commenced the so-called restoration, according to his lights and the means placed at his disposal. Upon close inspection of some of those piers we consider that it is not at all improbable that in some cases, if not in all, these angle shafts are plastered up after the fashion of Lilly's period, and still exist; but this, of course, without permission from the authorities, we could not further investigate. We ask you to inspect for yourselves the manner in which the arch mouldings are stopped over these champered angles, and draw your own conclusions, which, if they differ from those now advanced, we shall be glad to hear. As it is to the sculptured capitals and mouldings of these engaged shafts which we now chiefly look for the data upon which to base conclusions as to dates, we will take them in the following order:—1st, Those having archaic forms and grotesques, and with foliage; 2nd, those having foliage and mouldings showing characteristics of the Early English style in various stages; 3rd, those having foliage showing characteristics of the Decorated style of the thirteenth and fourteenth centuries. The capitals figured Nos. 1, 2, 3, 4, and 5 on the plan have carved on them, in very bold and prominent relief, those fanciful archaic forms and grotesques, and invariably some little foliage attached, and are assignable by comparison with well-known examples in English abbey churches to the Early English period. Take this one, No. 3. It is the only one of the series which we consider to possess any approach to symbolism, and we certainly find it placed in the most appropriate position, near to the modern pulpit. We have on it carved the tonsured head of the cleric, boldly projecting, and on each side attacking it with ravenous jaws are two nondescripts, which suggest by their attitudes the approach of some besetting sins to overpower the cleric. They have long, flat dragons' heads, powerful sinewy jaws, with goat's beards, the eyes cunning and intent even in their worn-out condition, the neck twisted, the bodies having wings of a bird with conventional feathers. Short-jointed bipeds they are, with claws and paws; the tail of one of them finishes with Early English foliated leaves; the extremity of the other is covered up with one of Mr. Charles Lilly's cherubic namby-pambyisms. This is the only instance we have in the eastern end of the cathedral of an Early English capital, and there may be a reason for this which at some future date we shall be able to explain. Capital No. 1, close to the north stair on the organ loft, has sculptured on it two grotesques with winged bodies, legs, and tails, like those on the capital near the pulpit, but these have human heads, with peculiar head-dress, and smiling faces very much worn. In capital No. 2 we have carved a series of female heads, on their faces a smile which ranges from broad laughter down to as subtle an expression of quiet comical humour as could well be imparted to stone, or preserved unharmed through the fiery vicissitudes of centuries. The leafage, which forms a sort of zigzag under the chins of those hilarious females, we would almost pronounce to be Early English but for the unconventional freedom of its treatment. This capital, it will be observed, is evidently not in its original place; it does not centre with the shaft, for which it is too small, and its abacus is too narrow to form a stop to the more prominent members of the arch moulding. Capital No. 4, on the north of the organist's seat, has from its position been for many years a weekly temptation to the choristers, and is mutilated in the most approved schoolboy fashion, but still has boldly projecting from its bill the figure of a stag at full stretch; also the bodyless head of an eagle and the headless trunk of a scaly monster. Capital No. 5, on the south of the organist's seat. We have hereon a bearded human head, with a cowl or low cap, and at each side a bird pecking, probably at some lost fruit among the worn foliage; the leafage is very freely treated; the birds are somewhat similarly placed to instances of Early English work in Westminster Abbey and Salisbury Cathedral, and on Archbishop Gray's tomb at York. Through the abbey there are a number of heads serving as stops for label mouldings, as springings for window arches. We note a suspicious uniformity in them and in the corbel clusters under the engaged columns from which the groining springs. We postpone expressing our opinion on these details. This exhausts the list of grotesques; probably some critic will be inclined to go much further than we have gone in finding hidden import in these carvings. We know that during the middle ages symbolism and allegory played the chief part in the sculptured decorations then introduced; from the numerous instances of chimerical monsters which meet the eye in every Gothic edifice, particularly those for ecclesiastical use, it will be obvious that in addition to their architectural purpose and necessity they were intended by the out-workman to personify human vices and evil passions. Frequently the more hideous ones were placed outside the building. Tradition at Down Abbey states it was so there on a corbel table, probably intended as a caustic hint to church-goers to leave their sinful thoughts outside the church. This practice of caricature was frequently carried to excess as a mere exhibition of beastly grotesqueness, leading ofttimes to lewdness and without any approach to symbolism. We find the Cistercian leader, St. Bernard of Citeaux, strongly writes to repress it, and demands from one of his subordinate abbots "the meaning of such deformed creatures." We are bound to remark with reference to all the mediæval work in Down Abbey that whether such sculpturings had a meaning and personified divers beastly sins, or whther they caricatured human follies, or whether they were intended to bear symbolical reference to the penalties of heresy and schism, or whether they were, as we believe them to have been, purely the artistic fanciful outcome of the minds of the Gothic sculptors of the period, they are not obtrusive nor disproportionate, and to the eye of a spectator, placed at such a distance as to lose detail, the outline and general proportions are satisfactory. Nay, the effect would be charming if we only had the clustered shafts and their capitals to dispel the clumsiness of the piers. With reference to the second class of capitals in the abbey, *i.e.*, those having foliage and mouldings showing details assimilating to the Early English, we find only one capital (No. 6) which reveals in its foliage a close approach to those peculiar scrolls, with spiral leafage, flowing tangentially out of the parent curves, the leaves lobed, and occasionally interpenetrating each other, so characteristic of Early English work. The foliage on the capitals Nos. 1, 2, 3, 4, and 5, just mentioned, possess all more or less of the characteristics of this No. 6 capital. We remark that there is no instance in the abbey of the "dog-tooth ornament," which is incidental to all Early English work. And as we come now to consider the carved work of the "Decorated period," we may remark, with reference to it, that there is no single instance of the "ball-flower," which invariably identifies itself with the work of that latter period. All the remaining carved foliage in the abbey is so unquestionably assignable to the "Decorated period" of the thirteenth and fourteenth centuries that we have no difficulty whatever in recognising it, and in tracing in it all the details and features characteristic of this period. We remark that this "Decorated" detail is almost entirely to be found in the eastern end of the church, while the archaic carvings are chiefly contiguous to the organ gallery. In this "Decorated" foliage we notice a profuse use of the vine leaf and clusters of grapes. We also in some of these capitals have a clever arrangement of oak leaves and stems, with acorns, and although in the leafage there is in nearly all instances a total absence of stiffness, formality, or conventionality, yet there is preserved through all this freedom and natural grace a certain systematic grouping and dexterous arrangement which is charming. We notice, however, a total absence of the forced undulation in the leafage which is very frequently found in "Decorated" foliage, particularly in the later stages of the style. In some of the capitals the leafage is very cleverly undercut, and we have to remark, in particular, that in the foliage in the capitals of the before-mentioned clustered shafts on the eastern wall we have specimens of workmanship, gems of art and genius, which may be taken as models by the cleverest modern stone-carvers. The sharpness of the detail of the sculptured work loses immensely from the numerous alternate layers of whitewash, or whiting and dirt, and although the verger and his assistants preserve the cathedral in a model state of cleanliness, and keep these carvings in particular carefully dusted, yet they cannot be expected to overcome the results and effects of original sin in the offending whitewash, and we would regret to learn that their vigorous scourings ever soared to such a high work of art as to divest these carvings of such original sin, and of what, to put it mildly, we must call "matter in the wrong place." With reference to the arch mouldings and bases of the columns, and a variety of details of mediæval work, we have already so far exceeded the time allotted to the paper that we must defer, *sine die*, our allusions to them. We may be allowed, however, a word in conclusion to the memory of Lilly, the architect of the cathedral, and in writing of this gentleman we cannot bring ourselves to abuse him or his work in the way in which we find some have done. We must remember that the voluminous text books of Gothic detail now to be seen "under the thumb" of even the best architects had in his day no existence. The science of archæology has benefited no class of men more than modern architects, and the benefit has spread itself from that profession into all the various arts and sciences which hail architecture as a loving mistress and nursing mother. We are threatened in these latter days that the fraternal bonds which have united architecture and archæology are to be rudely dissevered, when even the assisting hand of archæology is to be scorned and thrust aside; when modern architecture has got out of such leading strings, and is now in fit condition to spurn and repudiate the antiquated helpmate whose gleanings for the past fifty years she had been learning to utilise. Outsiders are now expectantly watching while she plumes her wings for a fly on her own account--while she develops this original 19th century style of architecture. Of course we wish such yearnings of flight and fancy God-speed! but we trust that if at any future time the mutilated remains of the ancient Cathedral Church of Down requires the care and supervision of an architect that it shall not fall into the hands of a man who is ignorant of the true applications of Gothic art or a self-sufficient scorner of the teachings of mediæval archæology.

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[*] Paper read on July 2 before the Royal Historical and Archæological Association of Ireland.

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ST. PETER MANCROFT CHURCH, NORWICH.

Mr. G. E. STREET, R.A., has reported on the church of St. Peter, Mancroft, the largest and best known of the many churches in the city of Norwich, to the committee concerned in its restoration. The report speaks for itself in its appreciation of the local architectural features, its clear diction and attention to detail. As to whether the Society for the protection of Ancient Buildings were justified in the cry of alarm they raised soon after Mr. Street was requested to report on the state of the fabric of this church, Mr. Street commences by expressing the sense of deep responsibility he feels in dealing with so noble an example of the finest type of a Mediæval parochial church, and states that he makes his proposals only after the most careful and thorough consideration. The tower requires first of all to be dealt with, because its state of repair makes it not only undesirable, but even unsafe, to leave it till other works have been done. Considerable repairs were executed to the stonework, probably in the 18th century, when the decayed stonework was made good by cutting out portions of old work and inserting new and thin stones of different quality, and nowhere properly bonded into the walls. The portion of the tower which is in the most dangerous state from the looseness of these stones is the facing of the buttresses, especially on the eastern and southern sides. The only question to Mr. Street is how far the repairs to the tower, in themselves absolutely necessary, should go. The general design of this steeple was well worthy of the magnificence of the stately church. Its size is unusual, 45ft. across buttresses, about 32ft. square without them, and upwards of 100ft. in height. The architectural detail throughout was also of a rich and magnificent kind, but this have been greatly damaged and altered; the old canopies, gablets, crockets, &c., have been pared down, the old cusping has been cut away, and the mouldings altered into a sort of bastard Classic section, and these altered stones are themselves in such a state of decay that every one of them may be said to require repair or renewal. Fortunately, traces remain of the original details of all these parts, and as repairs and renewals are necessary, Mr. Street says he can hardly conceive the existence of two opinions as to which of the two should be copied—the work of the master mason of this grand building, or that of the ignorant workmen of the 18th century, who treated the work with such scant respect. The uppermost stage of the tower above the belfry windows has been all destroyed, the panelling with which it was enriched is mostly removed, and the parapet and pinnacles are entirely destroyed, and the leaded roof now overhangs the walls in a very rude and unsightly fashion. He proposes to reconstruct this portion of the steeple; it is mean, shabby, and decayed, and any repairs would be incomplete, and worse, which did not deal with it. It will require great care to design a really good parapet and pinnacles, and he should be disposed to use as his guide the remains of the pinnacles at the east end of the church. The lowest stage in the tower is most remarkable; the church was planned so as to occupy the whole length of the churchyard from east to west, and groined passages were made both under the east end and under the tower, which gave access from one side of the churchyard to the other. The passage under the tower has a doorway and door in the west wall from the street, and also in the east wall into the church, whilst on the north and south sides fine archways opened into the churchyard. These are now bricked up, and the space within the tower is converted into a vestry. Above the groined roof of this porch the tower originally opened to the church with a grand arch, but this, too, has been closed, and the great west window is no longer visible from the interior. The restoration of these important features to their original condition is easy of accomplishment, and will enhance uncommonly the effect of the church, both internally and externally. The stone western gallery formed by the porch in the lowest stage is a Norfolk feature, and one which ought not to be concealed and forgotten in one of the very finest of the Norfolk churches. The ceiling above the tower-arch he proposes to make of oak, vaulted so as to harmonise with the exquisite roof of the nave.

The state of the fabric of the church is nowhere so bad as that of the tower. The leadwork on all the roofs is very old and in bad condition, and its taking up and recasting, like the works to the tower, should not be delayed much longer. On the exterior the old roofs have had new wooden cornices of Classical character added to the eaves. These are unsightly and inconsistent with the old work, and might be replaced by a cornice of smaller projection and more suitable section. The eastern pinnacles to the church have been in part modernised, and he proposes to restore them to their original design, which may be determined with a fair amount of certainty. The tracery of nine of the windows on the north side and that in the western bay of north aisle having been modernised and defaced, must be new. Mr. Street suggests the extreme importance of securing the houses which abut on the church on the north and south sides, so as to remove a source of danger and inconvenience, and to admit of the opening out of the interesting passage-way already measured, which passed under the chancel. This passage passes to the west of the vestries, which occupy a building three stories in height east of the altar. The two upper stories are vestries, the lowest one is a sort of crypt, which, if found accessible, might prove a very convenient chamber. There was another crypt at the east end of the south aisle, but this was lowered and destroyed when the church was last reseated, and need hardly be restored, as it would serve no useful purpose.

In the interior the roofs and walls are in such good condition that few suggestions for repair are necessary, and this portion of the report is almost confined to the rearrangement of the seats. Mr. Street suggests that the chancel should be extended to its old length, three bays from the east end, leaving six for the nave, and should be masked by high screens, the pulpit being moved one bay further west to suit the alteration. The whole of the nave and aisles are filled with oak seats of much solidity, and as they might without much difficulty be very much improved, he does not care to suggest that new seats more in accordance with the old Norfolk types should be erected. The fine old canopy over the font was altered in the 17th century, and cut down and altered again about thirty years ago; it is still an interesting relic, and he sees no advantage in making a conjectural restoration of it. The chambers connected with the church, including the parvise over the north porch and the two vestries, one over the other, ought to be carefully cleaned and put in proper order.

In conclusion, Mr. Street says that if this church could be repaired and rearranged in the mode suggested in the report, it would be one of the very finest parish churches in the kingdom. The design is magnificent throughout, and rises to the highest excellence in the central roof, which appears to him to be, on the whole, the most exquisite among the many exquisite examples of roofs in the eastern counties. He gives an approximate estimate of the probable cost of the works described, in the order in which they ought to be undertaken, as follows:—(1) Restoration and repair of steeple, £6,000; (2) Re-leading all the roofs, repairs of cornices, copings, crosses, eastern pinnacles and buttress heads, repair and renewal of clerestory and other windows, £3,650; (3) Reglazing all the windows, £500; (4) Rearranging the interior, altering seats, repairs of vestries and parvise, partly new stalls, screens for chancel, &c., £2,030; (5) Warming and lighting, £600; and (6) Reredos, £300, making a total estimated cost of £13,080. We hope the restoration committee will be enabled to carry the scheme out in its entirety.

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A school and house for the Ramsholt school board are just finished. The school will accommodate thirty-three children. The cost will be £700. Mr. H. Dudley Arnold, of Gorleston, is the architect.

AN EXPOSITION OF ARCHITECTURE.

CONTEMPORARY architecture may be judged with some degree of impartiality from the accounts given of it in works which appeal to a large class of the intelligent public outside the profession. It may be of some interest, therefore, to inquire how it has been described in such works of general reference as the "Encyclopædia Britannica," taking the recent edition of that work now in progress of publication as our guide. It may be remembered that in the last edition of that voluminous work the treatise on architecture was edited by the late Mr. Arthur Ashpital, F.S.A., a gentleman of acknowledged pre-eminence in his profession, but we believe the text of the article was from the pen of the former contributor, Mr. William Hosking, F.S.A., and formerly professor of architecture and engineering at King's College, a well-known architect engineer of his day. Since the publication of the last edition in 1852-1860, architectural taste has undergone so complete a change in at least one branch of the art, and the vicissitudes of fashion have so well-nigh upset many of the older canons of architectural criticism, that it is not at all surprising to find the observations on Gothic and Modern English architecture made at that time entirely out of date if not misleading. The examples, too, illustrative of the Pointed styles found in the plates to the last edition of the "Britannica," good as they may have been at the time, can be no longer accepted as embodying all or even the more important varieties of Mediæval architecture. Hence we find that they have been expunged from the present edition with one or two exceptions, though their place has not been supplied.

In the present remarks and quotations we intend simply to furnish the reader with some idea of the substituted chapters of the article in question which we see bear the jonit initials of Professor T. Hayter Lewis and George E. Street, R.A., undoubted authorities on the two great divisions of the subject. We shall confine our attention now to the section on "Pointed architecture," an appellation which has been chosen by the writer as the most general, marking as it does the genus, while the national species and their varieties may be fairly distinguished under it. We need scarcely say this section has been entirely rewritten.

The writer in speaking of national varieties, says: "Pointed architecture took root and grew with almost equal vigour, though under different conditions, in almost every part of Europe. But the honour of having developed the style to the very highest perfection must undoubtedly be adjudged to France, or rather to a small portion of the country including Paris, which formed the old Ile de France. In Germany there was much less national development. In Spain the architects of some of the finest buildings were Frenchmen, and the style can hardly be said to have been developed there at all. In England, on the contrary, though our earliest Pointed buildings were, undoubtedly, to a great extent, French in their origin, the developments of the art were soon entirely national, and were but little modified, even by the influence of the foreign religious orders, which, as at Fountains Abbey, had so much power over many of our religious foundations. From England the style was carried by Englishmen to Scotland, a poor country with no style of its own, and no cultivation, such as is necessary to produce an order of architects, and to Ireland, where the English architects followed the footsteps of the invading armies; and finally, if we may trust the evidence of the stones themselves, to the coast of Norway, where the cathedral of Trondhjem is as unmistakably English in much of its style and detail as any English cathedral." The Pointed architecture of Europe generally is followed by the special development of Gothic in England. The characteristic divisions of Norman, Transition, First Pointed, and Later styles are pointed out with considerable minuteness, after which the writer describes more briefly the progress of Gothic architecture in Scotland and Ireland. These divisions are treated in a concise manner, the modifications of window-tracery, mouldings, and details are traced through each style with a discerning and skilful hand. In speaking of First Pointed, the apt remark occurs: "The mouldings were delicately rounded, and alternated with hollows, so drawn as to give here delicate and there most forcible effects of light and shade. Thus the dark line produced by marble in a pier was continued by means of a dark shadow in the arch; and, without considerable knowledge of the science of moulding, it is impossible to do justice to this part of the English Early Pointed work, which has never been surpassed, if, indeed, it has ever been equalled at any period elsewhere." Again, the remark is made (elsewhere noticed by Garbett) referring to the tracery of Late styles, "The tendency of the modification was to make men think lines of more importance than masses, and, whether consciously or not, this was just what happened; not only window-tracery, but mouldings, carvings, and every other feature, were entirely changed in character." In describing the change towards the end of Edward the III.'s reign, which led to the Perpendicular being introduced, the author very fairly says, the "moving cause of the change was a sense of disgust at the vagaries into which the votaries of curvilinear window traceries had been led." Edyngton and Wykeham were endeavouring to correct this exuberant fancy by introducing vigorous, straight, vertical lines into the rebuilt nave of Winchester. No doubt a corrective was found necessary to arrest the curvilinear march of design, but the writer, in the case of Winchester, hardly takes into account the necessities imposed upon Wykeham in recasing the old Norman work of Walkelyn, and it is reasonable to assume that the vertical forms introduced there were as much from a constructive sense of the best means of adapting the new to the old masonry, as from a mere desire to vary the forms. Referring to the architects of the 15th century, the article observes:—"Few things can be seen more beautiful than the steeples of Gloucester Cathedral, or of St. Mary's, Taunton. The open timber roofs, as, for instance, that of St. Peter, Mancroft, Norwich, are superb, and finally, they left us a large number of enormous parish churches all over the country, full of interesting furniture and decoration, and also a store of interesting examples of domestic architecture, which are still the ornaments, and are associated with all the most interesting historical localities of the country."

We are astonished to find that nothing, or very little, is said touching Domestic architecture in this country. Surely an omission in a treatise professing to give an exhaustive account of English architecture. French Gothic is briefly referred to, and the writer observes, "for the purpose of complete study it would be necessary to keep entirely distinct from each other in the mind the following divisions: (1) Provence and Auvergne; (2) Aquitaine; (3) Burgundy; (4) Anjou and Poitou; (5) Brittany; (6) Normandy; (7) Ile de France and Picardy; (8) Champagne; and, finally, (9) the eastern borderland (neither quite German nor quite French in its character), the meeting point of the two very different developments of French and German art." The writer naturally admires the Gothic of Normandy and the Ile de France as the purest, the southern provinces being too influenced by Classic feeling and traditions; and in spite of the fact that the Romanesque churches of Aquitaine are singularly interesting and suggestive examples of the Greek cupola type of plan so thoroughly illustrated by the late Mr. E. Sharpe in his well-known lecture at Willis's Rooms; we believe also the student of French Gothic has much to be thankful for in the domical structures of Aquitaine and of the valley of the Rhone, where Byzantine and Roman influences appear to have conbined and produced such a unique specimen of its class as the church of Auvergne. Some interesting observations are made by the writer upon the distinguishing character of the roofing adopted by the Romanesque architects of France, the circular-ended apse with its aisle and chapels, the germ of the magnificent *chevets* of the northern cathedrals, but these are features with which our readers are tolerably familiar. Much of what is said regarding the tentative efforts of the French architects in their vaulting, and in the plans of their apses, has been repeated in Mr. Street's recent lecture that has been fully reported in the Building News. The Gothic architecture of Spain is a section that will be read with some interest, but we cannot do more than mention that the writer confines himself to the features of Spanish churches, and does not touch the domestic buildings, and concludes that the "mediæval architecture of Spain is of less interest than that of most other countries, because its development was hardly ever a national one." French and Flemish peculiarities were largely imported by the architects sent over, and the really Spanish character did not develop itself till the end of the 14th century. The brickwork of the country—very rich of its kind—is chiefly Moorish, as might be expected. Of the chapter on the Gothic of Italy, another very important section, we cannot afford space to say more than that the peculiarities of the style are pointed out with much feeling and clearness, and the author says:—"Italy is poorer than any other country in examples of the transition from round to pointed arched buildings. The use of the pointed arch was accepted at last as a necessity, and cannot be said ever to have been welcomed." The writer, in spite of his earlier sympathy for the style, says distinctly the "Gothic of Italy has no such grand works to show as more northern countries have. The buildings were seldom thoroughly beautiful as complete works of architecture." A certain awkwardness exists in plan and design, which even colour cannot atone for; and nothing can be shown to equal the English or French buildings in these respects.

The modern Italian school is next treated at some length, and the works of the cinquecentists are described; the English Renaissance is spoken of under the title of Modern English Architecture, but, strange to say, we find no reference to the latest revivals, such as Jacobean, and the section is decidedly imperfect in its reference to recent modern buildings. A few general observations on the "Present Position of Architecture" would only lead us to infer that the styles adopted were Italian or Gothic. We must reserve for future remarks an interesting chapter "On the Application of Colour to Architecture," in which the writer distinguishes two distinct orders of colourists—the "Constructional" and the "Decorative." The treatise is followed by an index, a complete glossary of terms, and by a bibliographical list that will be found of service to the student. The plates that illustrate the sections on Pointed and Modern English architecture are quite inadequate to do justice, and might indeed have been omitted entirely. There was undoubtedly an opportunity for taking up the subject of recent revivals such as Stuart, Queen Anne, and the other forms of neo-Classic that have been introduced of late years, and which, together form another well-marked epoch in the history of architecture. Nothing of the kind is attempted, nor have the present editors added any chapters upon subjects allied to architecture, such as decoration, geometric and harmonic proportions, and acoustics, as they affect the plans of buildings, &c. The articles, on the whole, though excellent as ably-written expositions of the great epochs of architecture, do not attempt anything beyond the bare facts of the several styles; we have no philosophical disquisition, as might have been expected in a treatise of the sort, and our impression of the contributions as regard the later periods certainly are disappointing, and scarcely come up to the reputation of so world-renowned a work as the Encyclopædia Britannica. The best illustrations are those given as wood engravings in the section on Indian and Eastern architecture, many of which have been borrowed from Mr. Fergusson's works.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

THE annual meeting of this Society was commenced on Tuesday week at Cheltenham, under the presidency of Mr. T. Gambier Parry, who said his theory of an inaugural address was simply to open the way and leave the course clear to others. The town in which they met gave them little besides affording a pleasant meeting place, though there were situated there some of the most famous educational establishments in England. If cities were left to the mercies of archæological societies, they might be more quaint than convenient; but one thing they would have, they would build their cities with at least some desire to secure the reverence of posterity. Ages hence, when England would have long since become a peaceful country of flocks and herds and free from pride, and not disturbed by commerce and politics, the antiquarians of those days, wandering over the country they visited to-day, would come among a great number of mounds, the relics of a great town built of brick and mortar. Like Marius weeping over the ruins of

Carthage, he would sit on a vast green hillock on what was once the Queen's Hotel—and, sighing out the name of Cheltenham, he would glance over the scenery. Turning from the ideal archæology of the future to their own archæology, he said they were there in a scene of great interest. In the reign of Henry VIII. it was remarked that Gloucestershire was not one county but several, as there were, hills, vales, and forests. These scenes of long past time in Gloucestershire were open to the archæologist, and the pages of the book would bear many turnings. Those days were rich in all the interest that romance and reality could combine to produce. Other ages had gone by more important to themselves since the Romans left their valleys on the Cotswolds and their camp at Gloucester. He referred to the migration of different nations to England who had made their mark, and observed that to this complexity of origin they owed their English industry and versatility. The greatest works of men had been executed in troublous times, even the arts of peace had flourished most when the earth was filled with intrigue and war. The battle of Tewkesbury and its effect on the civil strife which devastated the land in the wars of the Roses were dwelt upon, and the great work left on record in Fairford Church was alluded to in some interesting remarks, the President expressing his conviction that Albert Dürer could not have been the artist who did that great work.

Thanks were voted to Mr. Gambier Parry for his address, and the assembly then paid a visit to the parish church, under the guidance of Mr. Middleton. They next in vehicles went to Leckhampton Court and church, Canon Trye here acting as guide. The dinner of the Society took place at the Plough Hotel, under the presidency of Mr. Gambier Parry. The ensuing meeting, which was well attended, was held in the Ladies' College. Mr. C. J. H. Middleton, F.S.A., read a paper on the Church of the Blessed Virgin Mary, Cheltenham. The church now existing was built at various periods, and owing to the windows having been inserted at a variety of dates, it is impossible in every part to decide what is the precise date of the plain masonry in the walls. The oldest existing part of the church is the lower part of the tower and part of the west nave wall, with its broad buttresses and billet mould string. This belongs to the period of transition from Norman to Early English, about A.D. 1150. The points distinctly Norman are the cushion caps in the western tower arch and the abaci of the north and south arches. These abaci are merely strings, as the arches do not spring from beyond the line of the impost, a very common peculiarity of early work, probably a survival of classical precedent. The points that mark the transition to Early English are the pointed shape of the arches, the moulding of the east and west arches, and the carving on the caps. The work is somewhat rude, both in design and execution, as we see especially in the east or sanctuary arch, where the abacus is square in plan and quite unmoulded, and the mouldings of the arch do not seem to fit upon it. The south cap of this arch is rather richly carved with heads and foliage—one representing a queen and martyr—the head is crowned, and she holds a palm branch in her hand. The tower is groined with a simple quadripartite vault, the ribs plainly chamfered. There are carved heads at the top of the wall ribs. The only other place besides the tower where any of this transitional work remains is to be seen outside the west end of the nave, where the original broad flat buttresses with the billet-mould string have survived all the later alterations. It is interesting to note that this string is exactly the same in detail as that round the upper part of the western turrets at Bishops Cleeve Church. The whole tower and spire appear to have been built in three stages, with several intervals between each. The first, including the four tower arches inside, about 1150. The second stage, up to the main offset, about 1200; and the third, including the spire, not long before the year 1300. The spire, which is a very graceful one, is octagonal, with plain brooches and rolls at the angles. The height of the whole is 167ft. A good many feet of the top of the spire have been repeatedly rebuilt, and unfortunately the original lines were not carried out at the last rebuilding. There is a small priests' door in its usual place in the south chancel wall. The fact of this door being nearly always on the south side points to a special use for it. It seems almost certain that the chief reason for placing the priests' door on the south was for the greater convenience in slipping in and out of the church during the first part of the Burial Service. Nothing remains of the original high altar or its fittings. In this case there is no room for a fixed reredos; probably a movable dossal or retabulum was set behind the altar. The present oak table was made in 1638. To the north-east of the churchyard there still exists the base and shaft of a very graceful tall stone cross of Decorated style. The cross at the top has unfortunately been destroyed, and its place has recently been supplied by a sort of coping of four meaningless gablets, in place of a sun-dial that used to be there. On Wednesday week the members proceeded on an excursion which included a visit to Sudely Castle.

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FARM BUILDINGS.*

It is not surprising that the prejudice of farmers and stock owners is still too great to admit of a general concurrence of opinion in the scientific planning of homesteads. Though all intelligent agriculturists concede the value of covered steadings, there are many who still maintain that the old-fashioned open yard is the best. We have upon our desk a small pamphlet upon "Farm Buildings Past and Present," by Mr. James Cowie, M.R.C.V.S., of Sunbridge Hall Farm, in which the subject is discussed. Mr. Cowie is the author of several prize essays on agricultural subjects, and appears to have been one of the earliest to turn his attention to improved farm buildings. He describes the miserable condition of these buildings in Scotland at the beginning of this century how they were built of mud walls, that the dwellings contained only two rooms "with a pokey" bedroom between, and an unfurnished garret above, the roof being generally composed of rough wood and thatch. Puddled clay constituted the floor, and there were no fixed grates. An illustration of the value of buildings of this period is afforded by the author, who says that his grandfather, on entering in 1756 on a new lease of his farm, consisting of 300 acres, in the midland counties of Scotland, purchased buildings valued at £9 16s. 6d., then an ordinary sum. The author observed the great waste of fodder, the exposure of roots to wet and frost, the deterioration of manure by rain water in the open yards, the discomfort of the cattle, and the additional labour caused by detached apartments and this led him to plan a homestead for himself, so that everything should be under a continuous cover. The idea seems to have been taken up by other farmers who built upon the same principle, and the Prince Consort ultimately had an interview with Mr. Cowie, and expressed his approval of the plan. Mr. McCombie, of Tillifour, a leading agriculturist and others of his way of thinking, prefer the open yard principle, while another larger class are wedded to a system in which the advantages of the open and covered system are supposed to be combined. They believe a few open gables are required, to afford more air and sunshine, and the author endeavours apparently to combat this compromise, and uses some good weapons to demolish the arguments of his opponents. It has been affirmed that cattle hardened by exposure thrive better at grass, while, on the other hand, it has been contended with some reason that cattle under a moderately warm temperature come sooner to maturity and require less food, and the practice of our eminent breeders of cattle and thorough bred horses is adduced in substantiation. Various opinions are quoted by the author to prove that entirely covered yards are better than partially covered ones, if the temperature is properly regulated. Mr. William Ruxton, of Farnell, a well-known breeder, speaks most approvingly of one of the steadings built upon this system; Mr. James Caird, a distinguished agriculturist, also thinks the covered steading desirable, while another farmer alleges that those calves reared under cover made more progress than the others exposed to partially open yards. An American authority, Mr. John Wilson, observes, "I see no valid objection to having store cattle wintered under cover, so that ventilation is perfect. . . . One of the strongest reasons for wintering all store cattle and others under cover is the superior quality of the manure thus obtained. In the case of open yards there is no doubt that the very essence of the manure is carried off and lost." Mr. Hope, from experiments made, found that land manured from a covered yard yielded 4 tons of potatos more per acre than that procured from an open yard, "both sets of cattle having been fed alike." One of the essential conditions of an economic homestead is the central and convenient position of the straw and root stores, so that the feeding and littering may be conveniently performed, and that the attendants should have every facility at hand. Light and ventilation are no less important matters to be attended to when the covered system is adopted, and for this purpose the ridge principle of ventilation or louvres are admirably adapted. Cheap iron roofs have been applied advantageously for the covered yards, and if pantiles are used additional air may be obtained. Without efficient ventilation there would be doubtless much to urge against a covered homestead, the effluvium of one compartment would contaminate the next; the air should circulate freely through the apartments, and these should be arranged economically and in a proper relation to each other. Economy of construction is one of the strongest recommendations of the plan suggested, as there are fewer outer walls; while the labour of attending to the stock is minimised, and there is no need to go into the cold or outer air. Against these advantages, there is the greater risk of destruction in case of fire, should one break out in any of the apartments, a risk that may be lessened by carrying up the division walls to the roof. Another disadvantage in the continuous covered plan is, the greater probability of infection in case of disease among the stock, which the group system obviates. These at least are points that are not discussed in Mr. Cowie's little work; they have doubtless been answered before, and it is for the farmer to balance the greater against the lesser advantages and probabilities before building his homestead. The fact however, remains, that with care and foresight the covered plan may be made effectual, and that a less quantity of food will suffice under cover.

We can commend the author's remarks to all agriculturists. The system advocated is not new or untried. The Highland and Agricultural Society awarded the author the gold medals for the best plans for large and small farms which were arranged upon this method, and the system is extending gradually. Though the author does not think the partially open yards either necessary or advantageous, he nevertheless says, to meet the views of a large number of stock owners, he has in recent constructions, "provided yards open in front attached to those covered in, access being had by doors or gates to be open or shut at pleasure." A good plan is seldom adopted at once, and a compromise is often the surest sign of reform. The old-fashioned open yard plan is certainly the most picturesque form of farmstead, but we do not despair of seeing architectural skill extended to the new principle, though the author does not furnish any hints upon this point.

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CHIPS.

A Local Government Board inquiry was held at Llandaff last week, before Major Hector Tulloch, C.E., inspector, into an application from the Cardiff rural sanitary authority for sanction to borrow £3,000 in order to carry out a scheme of sewerage in the city of Llandaff.

The parish church of Sawley, near Ripon, has just been enriched by a painted east window, having for its subject "The Good Shepherd." The reredos has has been decorated with colour in harmony with the window above it by the same artist, Mr. W. G. Taylor, of Berners-street, London, W.

An assembly room and schools have been added to the Belgrave Independent Chapel, Over Darwen, at a cost of about £7,000, and will shortly be opened. The architect is Mr. W. Kenyon Knapp, of Manchester, and the builders Messrs. Lloyd and Millward, of Over Darwen.

A brass tablet, to the memory of General the Right Hon. Sir Thomas M. Biddulph, K.C.B., Keeper of Her Majesty's Privy Purse, has just been placed in Holy Trinity Church, Windsor. It is mounted on black Belgian marble, and measures 6ft. 10in. by 3ft. 4in. The design has had the approval of Her Majesty, and the work was intrusted to Messrs. Matthews and Sons, of 377, Oxford-street, London.

A painted window has been placed in Trinity Church, Tewkesbury, as a memorial of Captain Ruddle.

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* Farm Buildings, Past and Present, By JAMES COWIE, M.R.C.V.S., Bromley.

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ILLUSTRATIONS.

SECOND PREMIATED DESIGN FOR THE WESLEYAN THEOLOGICAL INSTITUTION, BIRMINGHAM. — WAREHOUSES IN DEVONSHIRE-STREET, CITY.—ST. LUKE'S CHURCH, SOUTHPORT. — QUEENSMEAD, WINDSOR. — TIFFIN'S ENDOWED SCHOOLS, KINGSTON-ON-THAMES.

OUR LITHOGRAPHIC ILLUSTRATIONS.

WESLEYAN THEOLOGICAL INSTITUTION, BIRMINGHAM.

We illustrate this week the second premiated design for the above building, submitted by Mr. C. O. Ellison, of Liverpool. The author has quite reversed the order of arrangements in our other colleges, and given the best positions in the building to the rooms in which the students live, instead of to the lecture-rooms, library, &c., to which they only go at special times, and where ample light and perfect quiet are more important than a beautiful prospect. With this view the studies are placed mostly in front, and all with an open look-out, all on the ground-floor—12 by 9ft. being the general size, and a few larger (which could be used by the "three-year men"). Alternative elevations were prepared—one of a simple Gothic character, using a few good features and bold outline to give character to the whole block without unneccessary expense; the other in the old English half-timbered style. Both have clock-towers as an essential feature, both for effect and convenience, and seats are provided on the best side for the use of the students when the weather permits.

WAREHOUSES IN DEVONSHIRE-STREET.

The drawing of these warehouses in Devonshire-street, which have been erected for Mr. E. Farmer, from designs by Mr. W. West Neve, is on exhibition at the Royal Academy.

ST. LUKE'S, SOUTHPORT.

This design was submitted by Messrs. Burder and Baker, in an open competition, and is one of a series illustrating various types of designs, suitable for town churches, the chief characteristics being size and simplicity of plan and construction, by which means large and dignified churches may be built at a reasonable cost. The only costly feature is the tower, which is entirely separate from the church, and could be built independently of it.

QUEENSMEAD.

This mansion is now being built at Windsor, on a piece of ground which is being laid out with great taste by the proprietor, Mr. H. Henry, overlooking the Long Walk. It is being carried out in the Elizabethan style of local red brick, with cut and moulded red brick details and red tiled roof. The buildings comprise the main house and offices attached to the stable offices, and lodge with gates, and boundary walls to King's-road. The grand hall in centre will run up the whole height of roof, which will be of open timber work, and, with the gallery panelling, &c., will be carried out in Jacobean work. The floors of all principal rooms will be of oak parquetry, and the entrance hall will be laid in marble mosaic pavement. The main house is being carried out by Mr. Watson, of Ascot, the stables and lodge, &c., having been done by Mr. Hollis, of Windsor; Mr. Walker F. Lyon, of 50, Lincoln's-inn-fields, being the architect.

TIFFIN'S SCHOOLS.

The above schools have been erected at the east end of the Fairfield, Kingston-on-Thames, and consist of a handsome pile of buildings, the style being Scholastic Gothic. The whole length of the building is about 150ft., and is built of picked yellow stocks, having red brick bands, the plinths, stringcourses, window-sills, eaves and gable cornices, arches to doors and windows being also of red brick. The roofs are covered with stained tiles, finished with ornamental ridge tiles. The residences of the master and mistress are placed at the north and south ends of the building; they each contain sitting-room, three bedrooms, kitchen, scullery, larder, and the requisite domestic offices. To the left of the main entrance on the ground-floor is the large schoolroom for boys, 50ft. long by 21ft. wide and 14ft. high, arranged for dual desks five rows deep, at either end of this room are two classrooms 18ft. 6in. by 15ft. To the right of the main entrance is the cloak-room and lavatories, fitted with Finch's War Office lavatory range. The girls' schoolroom is situated on the first floor over the boys' schoolroom, and is of the same dimensions, with the exception that the height from floor to centre of roof is 23ft. The latter is an ornamented open roof, having moulded braces with circular piercings, supported on moulded Portland stone corbels. Two classrooms of the same dimensions as those for the boys are provided at each end. The girls' lavatory and cloak-room is to the left of the main entrance ground-floor. Great care has been devoted to the sanitary, heating, and ventilating arrangements and good lighting. The whole of the walls throughout are distempered, those throughout the passages and schoolrooms are finished in pure cement 5ft. from the floor, finished with flush moulded bead. These last, together with the whole of the woodwork, are painted in two colours. Each school is provided with a spacious playground. The entrance of the girls' schoolroom will be from the Albert-road, and that to the boys' from Fairfield-road South. The schools are intended to accommodate 150 boys and 150 girls. They have been erected from the designs of Mr. John Loxwood King, Architect, 18, North-road, Surbiton. The work has been carried out by the contractor, Mr. W. Prout, of New Southgate; Mr. T. Hardy being clerk of the works. The whole cost of the building when completed is estimated at about £5,000.

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THE NEW CENTRAL FRUIT AND VEGETABLE MARKET FOR LONDON.

The Corporation of London at their last meeting, as we stated last week, approved the City Architect's plans for the erection of the London Central Fruit and Vegetable Market, on land adjoining the Central Meat and Poultry Markets, at Smithfield, at an estimated cost of £115,000. The market will have a frontage on four streets or roads, viz., Charterhouse-street, Western-roadway, New Southern-roadway, and Farringdon-road. The main floor of the market will be as nearly as possible level with the other markets, so that the entire range will be readily approachable the one from the other. There will be three principal entrances—on the east, north, and south. The plan shows an area of nearly 44,000ft., devoted to wholesale market purposes, surrounded by 41 shops fronting the several streets, which can be used for retail or other purposes, and these occupy an area of some 16,800ft. The general or market area is approached, not only by the three main or vehicular entrances, but by two entrances for foot passengers. The market will consist of a series of shops 33 in number, having in front pitching stands for goods and waggon stands, the whole being approached by a roadway having a width of 18ft., always clear for vehicular traffic. In the middle of the market area is a further arrangement of pitching stands, with an area of about 4,400ft., including gangways. In roofing the market the floor will be kept as clear and open as possible, the detached main roof supports or columns being 37 in number, and the clear span of the roof is 45ft. The roofs will be of a light iron construction, with a range of glass louvres at the plate and ridge levels, affording an ample amount of light and air, so requisite for a market of this character. The height of this roof will be 28ft. to the level of plate, and 45ft. to the ridge of louvres. There will be a roadway approach to the basement, which will be suitable for market and railway purposes. The general appearance of the building externally will be as similar in character to the other markets as the less expensive nature of the works will allow. The cost of the superstructure is estimated at £115,000, but the land and approaches will cost in addition £175,937, according to the estimate.

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MANINGHEN STONE.

We have seen a sample of a new and valuable stone lately brought to London by the Maninghen Stone Company, who are owners of the extensive quarries of that name situate near Boulogne. The stone is of a uniform bluish grey colour, and its durability, power of resistance to pressure and wear, and good weather qualities, will soon recommend it to architects and builders. Its density is so great that Kirkaldy's test proves that it requires a pressure of 693 tons per square foot to crush it. It will thus be seen that it compares most favourably with the hardest class of granites and other hard stones for bases, plinths, engine-beds, plummer-blocks, &c., as it will carry heavier weight than most of them; while at the same time we are assured that there will be a great saving in cost. It is well adapted for steps, landings, paving, staircases, pillars, copings, sills, corbels, templates, bed-plates, monumental tablets, sarcophagi, &c.; whilst, for engineering work, hollow quoins, shuttle stones, aprons, &c., it will be found especially suitable. It is easily converted, saws well, frets readily under the tool, and, from its homogeneity, can be worked by any machine, bearing sharply defined arrisses and a good surface. One great advantage is that, being a silicated limestone, in steps, pavements, entrance halls, &c., it wears clean, and does not become greasy or slippery, but presents a firm foothold at all times. Samples may be obtained from Mr. Samuel Trickett, F.G.S., Victoria Stone Wharf, Millwall, E., or R. Byron Johnson, 8, Whitehall Place, S.W.

* * *

CHIPS.

The Sun-street to Worship-street improvements in the City, was opened by the Chairman of the Metropolitan Board of Works on Monday week. The new thoroughfare connecting these streets, and which will be known as Appold-street, has been constructed from the plans and under the superintendence of Sir J. W. Bazalgette, engineer to the Board.

By the death of a brother of Sir John Watson Gordon, formerly president of the Royal Scottish Academy, a bequest of £11,000, which had been left for the foundation of a chair of fine arts in the University of Edinburgh, has become payable.

The Tees Conservancy Commissioners have just secured a loan of £53,000 from the Public Works Loan Commissioners for the purpose of deepening the river, so as to afford an efficient harbour of refuge.

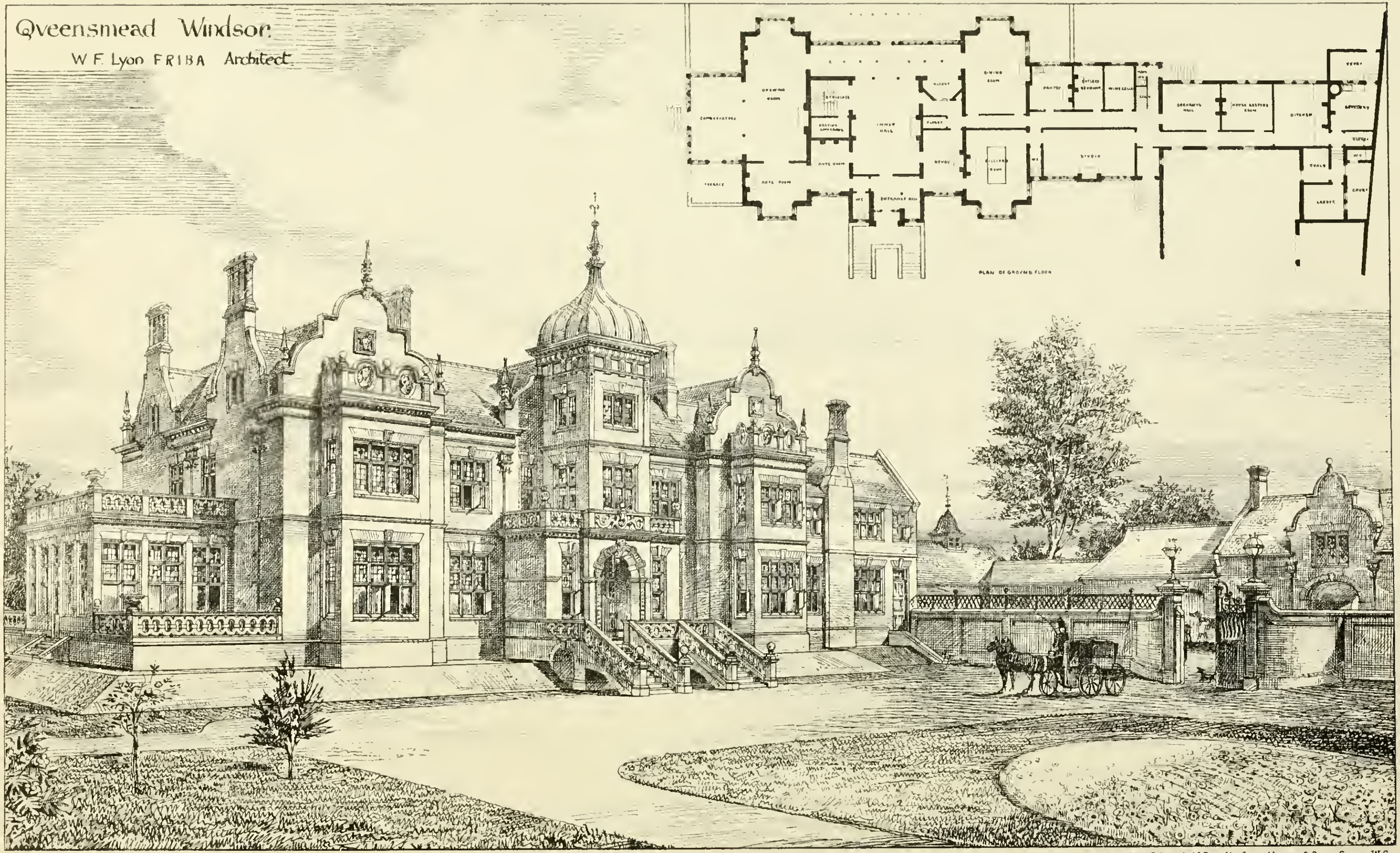
Mr. Thomas Oliver, of the firm of Messrs. Oliver and Leeson, architects, Newcastle-on-Tyne, having been consulted by the Hexham School Board in reference to the condition of their Board schools, which have been repeatedly complained of by the Government Inspector, has presented his report and prepared plans for various important re-arrangements and improvements; and these having obtained the complete approval of the Education Department, the works are to be begun immediately.

Mr. T. W. Whitley has been elected surveyor to the Coventry rural sanitary authority.

New municipal buildings at Helensburgh were formally opened on Monday. The building is in the Scottish Baronial style. The architect was Mr. John Honeyman, Glasgow.

Queensmead Windsor

W. F. Lyon F.R.I.B.A. Architect



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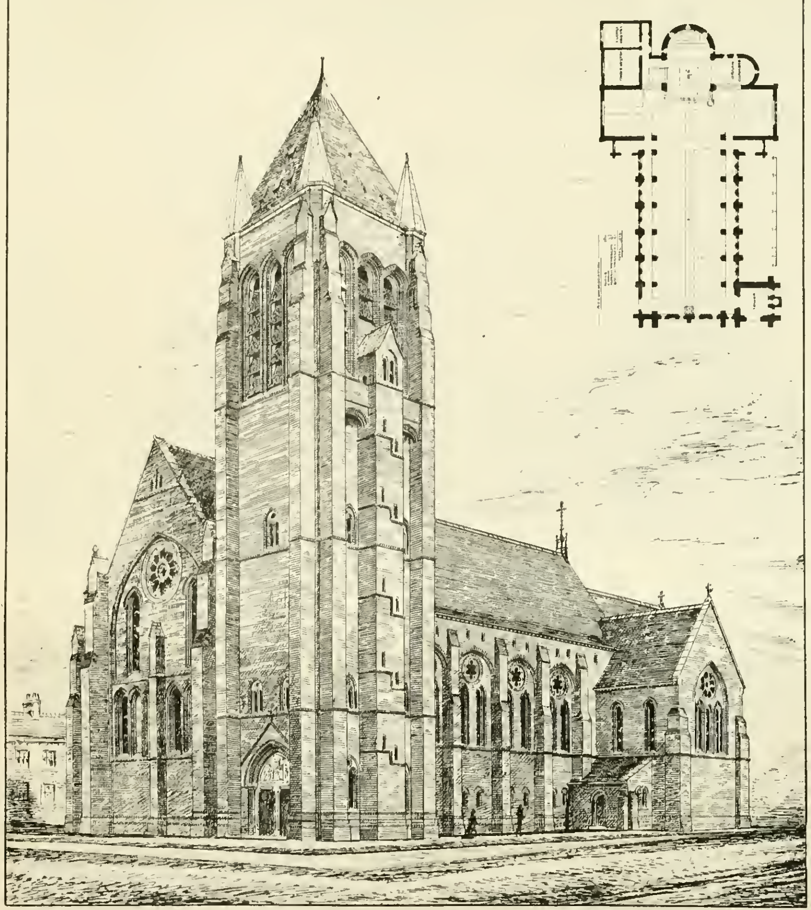
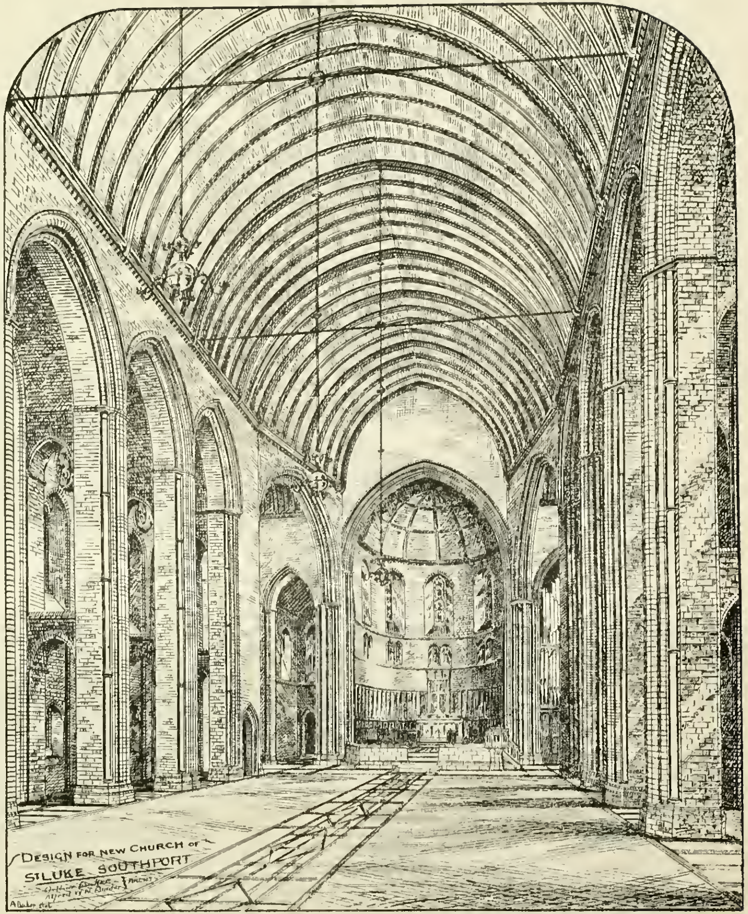
ST LUKES CHURCH SOUTHPORT



Messrs Burder & Baker Archts



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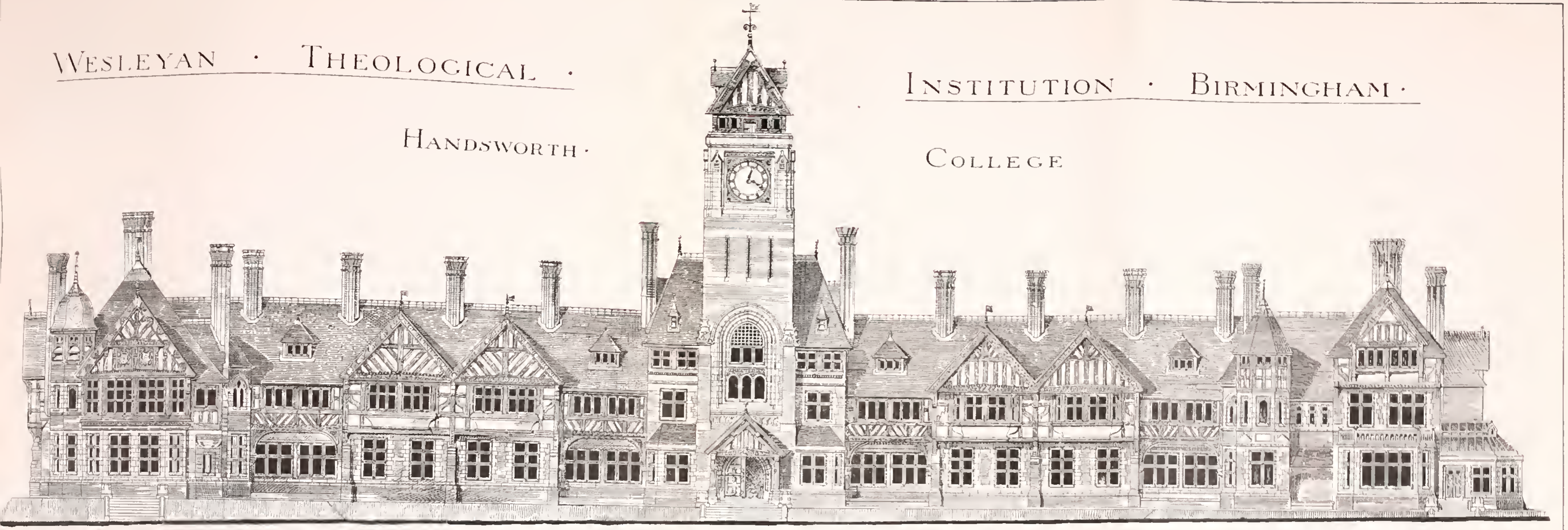
WESLEYAN · THEOLOGICAL · INSTITUTION · BIRMINGHAM ·

HANDSWORTH · COLLEGE



FRONT ELEVATION

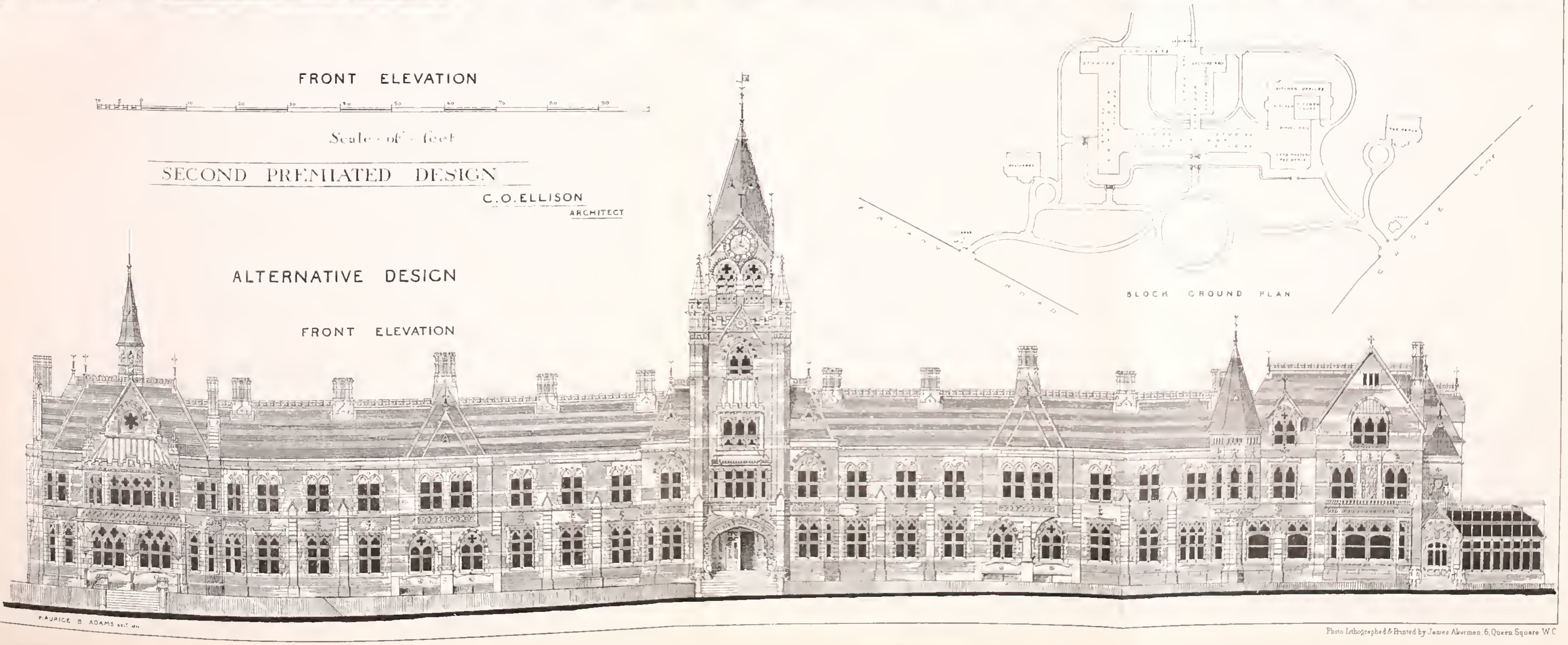
Scale of feet

SECOND PREMIATED DESIGN

C. O. ELLISON
ARCHITECT

ALTERNATIVE DESIGN

FRONT ELEVATION



BLOCK GROUND PLAN

MAURICE B. ADAMS del.

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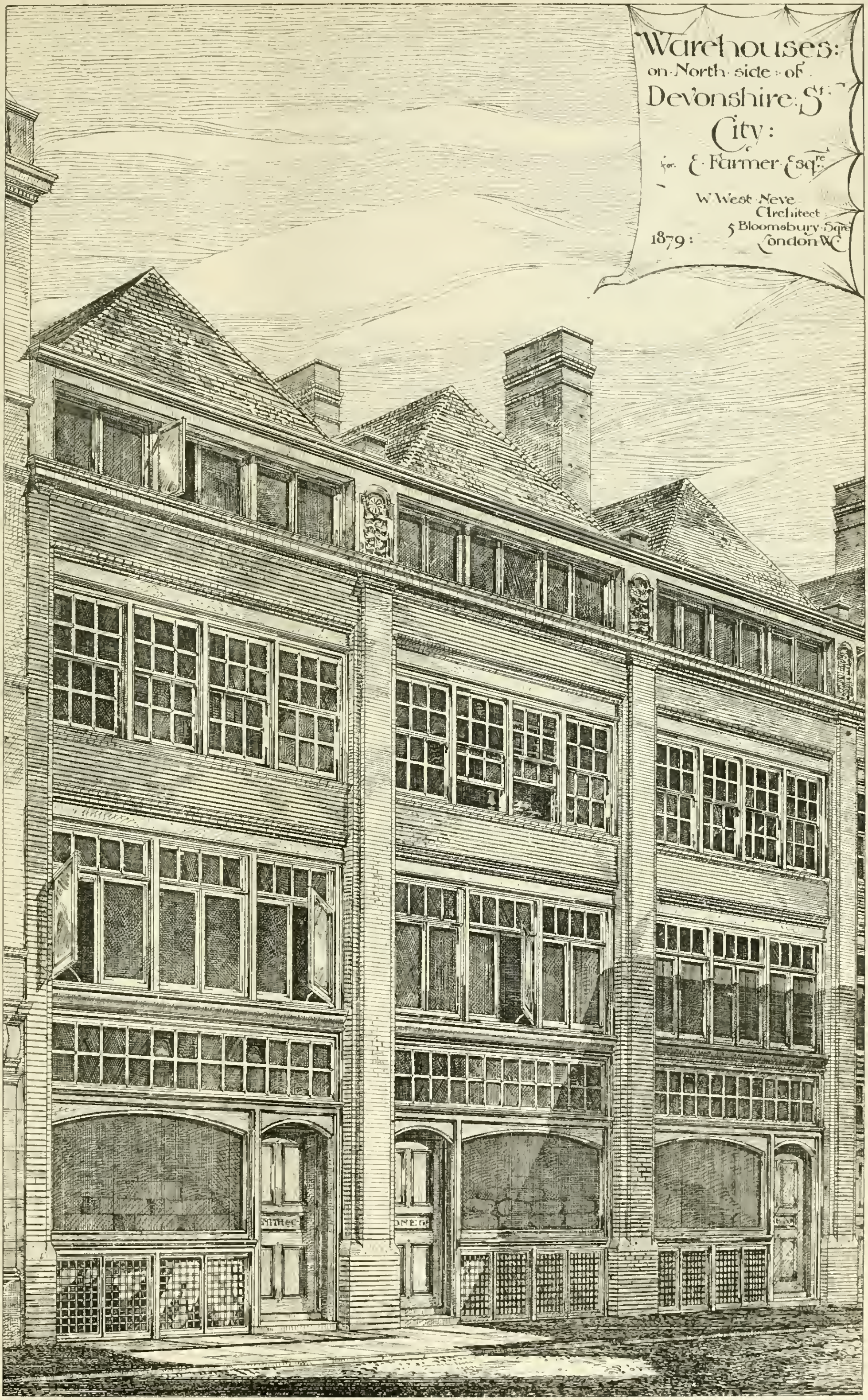

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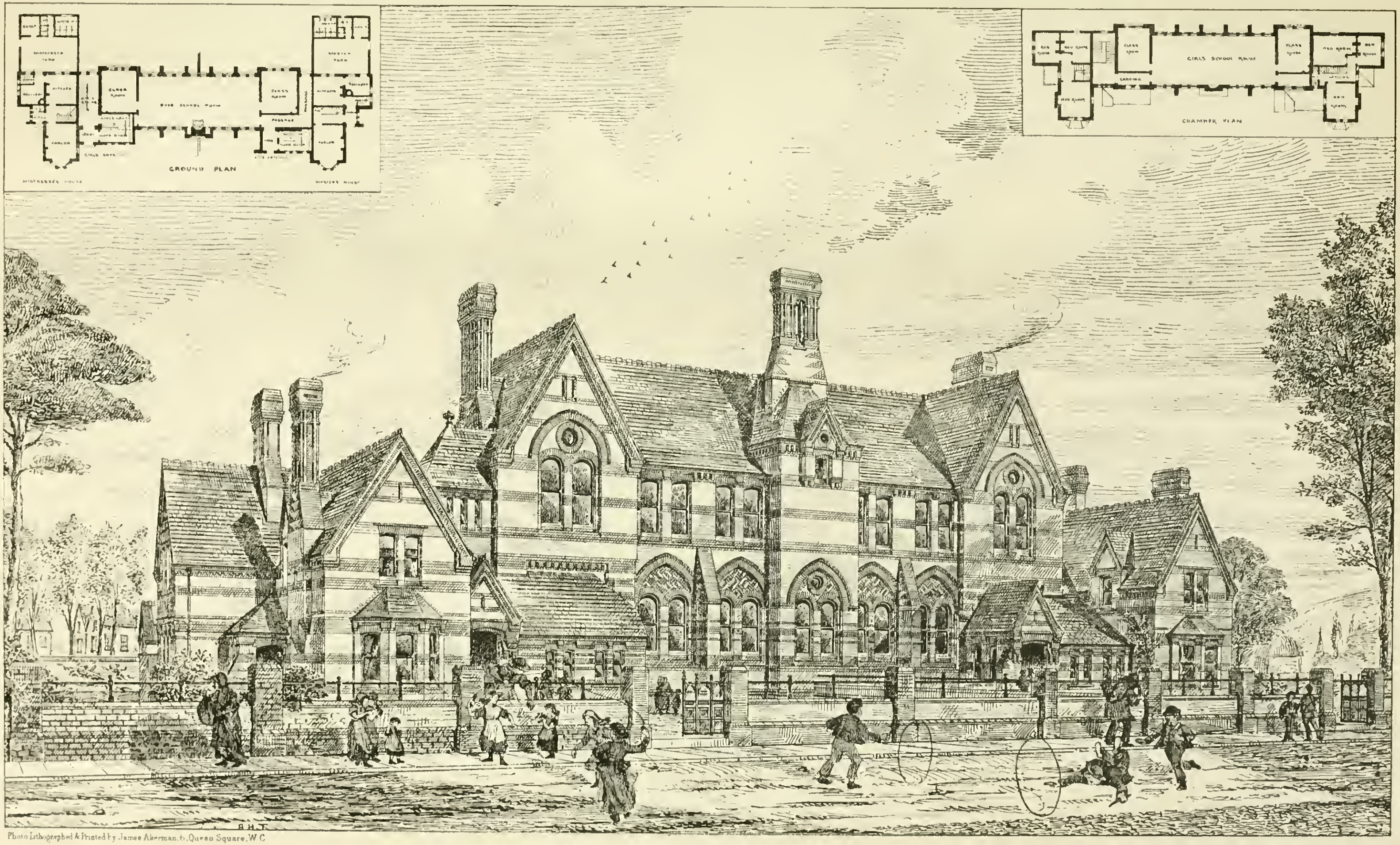

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TIFFINS ENDOWED SCHOOLS KINGSTON ON THAMES J. LOXWOOD KING ARCHT

SANITARY INSTITUTE OF GREAT BRITAIN.

THE Duke of Northumberland presided on the 10th inst. at the anniversary meeting of this society, which was held in the theatre of the Royal Institution, Albemarle-street. The annual address was delivered by Mr. G. J. Symons, F.R.S., on "Water Economy." During the meeting the prize medals and certificates awarded for certain inventions shown at the Stafford Exhibition were presented. The Richardsonian gold medal was awarded to the Silicate Paint Company for "Griffiths' patent white"—a non-poisonous substitute for white lead—the chairman remarking, as he handed the special medal to Mr. Thomas Griffiths, F.C.S., that his was the most beneficial discovery ever made for preventing the dreadful suffering caused by the use of lead paints. His Grace then proceeded to distribute the medals as follows:—The Silicate Paint Company, for Griffiths' Patent White; ditto (bronze medal), for their preparations of silicate paint, enamel paint, and petrifying liquid; Messrs. Pocock Brothers, for universal invalid tubular water and air beds; Messrs. Billing and Co., apparatus for cooking by gas; Messrs. S. Leoni and Co., apparatus for ditto; Messrs. Doulton and Co., for Stanford's patent joints for stoneware pipes; for Moule's patent earth closets; Major F. Duncan, R.A., Woolwich, ambulance wheeled litter; Sanitary Appliance Company, Salford, portable cinder-sifting ash-closet, with soil-pail; Mr. G. E. Pritchett, economic hollow flooring; Mr. J. E. Ellison, of Leeds, patent conical ventilators; and Messrs. Hassell and Singleton, Birmingham, Phœnix portable range, with reducible fire without gas. Following the medals, came the distribution of about 20 certificates; and at the conclusion of the ceremony the Duke of Northumberland vacated the chair, which was occupied for the remainder of the time by Dr. Richardson. Mr. Symons, in the first part of his address, explained the circumstances which combined to render the small areas in the kingdom on which upwards of 75in. of rain fall annually of great national importance. Almost all these districts of heavy rain were districts of hard rocks, of steep slopes and of sparse population. The first of these conditions insured the permanency of the physical geography of the district—the rocks being too hard to be washed away—and therefore the permanency of the rainfall; the second lessened evaporation, and sent the water rapidly into the streams or lakes; and the third tended to insure the purity of the effluent water. Having traced the water from the clouds to the earth, he next considered the effect of soil, crops, inclination of ground, &c., upon the water thus precipitated. After showing the necessity for modifying our customs and laws respecting rivers and water-courses, &c., in conformity with the advance of civilisation and the increasing population of the country, he asked whether it was not rather a farce to describe a scheme the works of which traversed three or four counties as a "private Bill"? The absence of any Government department to watch over our national water supply left the committees to whom these so-called private Bills were referred in an unsatisfactory position. When nearly all the gathering grounds in the country had been awarded in perpetuity to some of the towns which at present were the most wealthy and important, we should probably form a department to watch over the remainder. In conclusion he recommended that the entire administration of streams should be under a single direction, which should see to all questions of drainage, sewerage, canalisation, motive power, and water supply. Such new works as were required promptly should only be authorised subject to their reverting to Government in 50 or 100 years. All other hydraulic works should be undertaken, or at all events supervised by a Government department, so as to insure the greatest possible public benefit, and not merely that of an individual town. Mr. E. Chadwick, C.B., in moving a vote of thanks to Mr. Symons for his address, said the future of agriculture would depend largely upon a proper regulation of the supply of water in a way to prevent the evils arising from an excess or deficiency. For the health of the people, also, it was most desirable that a department should be established to superintend drainage and water supply. Mr. George Palmer, M.P., who seconded the motion, thought it might be desirable that a Board, represented in Parliament, should be created to have charge of all matters relating to the collection and distribution of water. In the evening the anniversary dinner was held at the Grosvenor Restaurant, when the chair was taken by Dr. B. W. Richardson.

After the toast of "Success to the Institute," and other sentiments, had been duly honoured, Dr. Corfield proposed "The Health of the Successful Exhibitors," coupled with the name of Mr. Thomas Griffiths, F.C.S., who had at the meeting earlier in the day received at the hands of the Duke of Northumberland (President of the Institute) the special gold Richardsonian medal for his invention of a non-poisonous white paint, as a substitute for lead. Dr. Corfield said that those whose health he had the honour to propose knew that their inventions were thoroughly appreciated, not only by the Sanitary Institute, but also by the public generally, whose welfare would be improved by the introduction of many of the appliances to which medals had been awarded. He wished to say that he should be very glad to receive specimens of successful exhibits, as they would form valuable additions to the Parkes Museum of Hygiene, and with regard to Mr. Griffiths, who had obtained the special medal for an exhibit of pre-eminent merit, he was quite sure that the paint produced was one which was calculated to prevent the many evil results now caused by the use of lead in the manufacture of paints.

Mr. Thomas Griffiths, in reply, said that he thanked the Institute most heartily for the distinguished honour which had been conferred upon his firm, and upon himself by the presentation of the Richardsonian medal, but that, gratifying as it was to receive such a special token of merit from the Sanitary Institute of Great Britain, that award was as nothing in comparison to the satisfaction he felt at having been instrumental in saving the lives and preserving the health of so many of his fellow-creatures. He was glad to say that his endeavours to produce a complete substitute for the pernicious white and red leads used so universally in houses and ships, had been appreciated not only by the English, but also by foreign governments, whose demands for his patent paint had shown that they were quite alive to the advantage of sanitary reforms, more especially when such could be combined with economy. The new zinc, or, as it was now generally known in the market, "Griffiths' Patent White," would do even more work than the poisonous carbonate of lead, and could be produced at quite as cheap a rate per ton. At the same time it had a covering power or "body" of more than double that of carbonate of lead or oxide of zinc, and therefore consumers, even supposing they had no sympathy with the cause of sanitary progress, would not be sacrificing economy by the use of his paint. He had felt, indeed, that it was of no use for him to produce a sanitary pigment to supersede lead unless it was one which was capable of doing all that carbonate of lead could possibly do, and his aim had ever been to combine commercial economy with sanitary reform. He had, too, felt deeply flattered by the remarks made by the Duke of Northumberland when presenting him with the medal that afternoon, his Grace having said that he considered that this new white was the most beneficial discovery ever made for preventing the dreadful suffering caused by the use of lead paints. In thanking the institute for the other medals which it had awarded to his firm for Silicate and other sanitary paints and colours he had introduced, he would only say that the Silicate Paint Company was now doing all in its power to supplant lead pigments by the energetic introduction of non-poisonous paints, and to show that it was in earnest in the work, he would mention that it had already spent upwards of £25,000 in the erection of new paint-works on the banks of the Thames. These works were producing 100 tons per week of purely sanitary paints, which he hoped would do much to diminish the suffering daily caused by the use of pigments containing salts of lead, arsenic, or other poisonous ingredients.

ROADWAYS.

IN the last number of the *Transactions* of the American Society of Civil Engineers there is a paper on "The Construction and Maintenance of Roads," in which the author, Mr. Edward P. North, C.E., furnishes the results of his experience in the charge of such work, and also various details culled from observation of the best roadways in London and Paris. There is an old adage which inculcates the advantage of leaving home to learn the news, and, upon a similar principle, our roadmakers and surveyors may find much to instruct them in Mr. North's paper. He picks many holes in our methods of road-construction, especially our macadamised surfaces, and of rolling we find the following remark, speaking of Sir John Burgoyne's paper written in 1843 upon the subject: "His opening sentence, 'the importance of rolling roads either newly constructed or when subjected to extensive repairs seems never to have been duly appreciated,' is still true in England, for the writer saw loose stone kicking about Great George-street, in front of the Institute of Civil Engineers, for over a month." Whether a piece of irony we cannot say, but, if sarcastically intended, there is also some truth in the allegation. He says, speaking of earth or gravel roads, the effort should be to keep the surface material as homogeneous as possible, so that it may be uniformly hard. The upper material should be thoroughly rolled in thin layers, with sprinkling of water if the material is too dry to pack well. "The most efficacious roller for this purpose is of two sets of discs, one about 8in. less in diameter than the other, placed alternately on the axis of the roller. It is understood that the cost of compacting reservoir embankments with this roller is about three-fourths of a cent (about ½d.) per cubic yard." If the road is of sandy soil, clay or "clay hard-pan" is recommended as a covering; if clayey, sand is necessary. As regards repairing, once or twice in the year is not considered economical. The author says, "A fair average for reforming a mile of old road, 30ft. wide between gutters when the material was mostly cast from the sides was 164 days, 10 hours each, of labourers, and two days of a double team hauling earth, carrying away stones, and moving tool-boxes." Double teams are more economical with "hones" or scrapers, rollers, and watering-carts. The hone used is described as an oak plank, 2in. thick, 10in. broad, and 9ft. or 10ft. long, shod with iron on its lower edge. It may be drawn vertically along the road either by a tongue or chain, slightly inclined to the line of travel, so that small depressions are filled up and the earth is scraped to or from the centre of road. One hint is worth mention—it is, that for horse rolling binding should be used very sparingly, and simply as a glaze to hold the stone; if it contains clay it should be as moist as possible, not to stick to the roller. There is a philosophy in laying on the material of roads, and especially in rolling them, that has not been studied with profit by many of our roadmakers, and Mr. North's remarks will be read with interest.

He speaks with commendation of those machines which combine a scraper and roller in a frame, and suggests that the roller should follow the re-forming of the road bed. A water-cart holding 60 cubic feet, will water 830 to 860 square yards; two sprinklings per day are thought sufficient, and the author adds, this process is the only thing that will preserve a road from breaking up in dry weather. Speaking of gravel roads, the author says when the gravel is over 1in. in diameter, it is very difficult to keep the road bed from breaking up when dry, and he thinks ¾in. would be a better size, unless the road be constantly watered in dry weather. Small gravel makes a pleasanter road and can be better kept in order. St. Nicholas Avenue is spoken of as a good specimen of a road; and another is described by W. H. Grant, which has a foundation of rubble stone, covered with quarry chips and rolled with 2-horse rollers 6ft. long. This rolling prevents the gravel filling the cavities of the rubble bottom so that its cellular character may remain unimpaired, to facilitate drainage. The gravel was applied in two or three layers, making a depth of 4 to 6in., each layer being rolled, the last by a roller weighing 6½ tons, 5ft. long. These roads are well underdrained and side-guttered, and are famed for their excellence. In alluding to "Macadam" roads, Mr. North observes that Macadam has the engineers of France and England on his side; he further mentions the fact that neither this system of road-making nor that of Telford used a roller, both depending on the grinding action of traffic to compact their roads. Sir John F. Burgoyne was the first who brought rolling in England into prominence, and the author observes with some truth that writers on roads have not always kept the differences of the three types of Macadam roads—namely, traffic made, horse rolled, and steam rolled—before their readers. "The grinding action of wheels will pack the hardest stones of proper size, and make a firmer road-bed than a softer material; but about one-third of the material is worn out in the operation, to say nothing of the wear on horses and carriages." Horse-rolling, on account of the digging action of horses' feet, will only bind the softer rocks. Steam-rollers are preferable. The author observes, the greatest weight attainable by horse-rolling is 260lb. per inch run of roller, which is not sufficient to make a road of trap, while the weight of steam-rollers may be made to anything, and there is no cutting up by horses' feet. Several examples of good roads are mentioned in the author's paper, to which we need not refer. Speaking of English road-making, he says "there does not seem to be any well-established system. Some of the borough surveyors apparently do not believe in any rolling at all; others, after carefully picking up the old road-bed, put on the stones, and after more or less traffic has passed over it, put on a 5-ton roller, 5ft. long, drawn by 4 or 6 horses." "Hoggin," or binding, a mixture of loam, coarse sand, and gravel, is added, with water sufficient to flush the interstices, and leave a surplus of granite on the surface, but Mr. North says, this "hoggin" acted as a lubricant in the roads he saw at Russell-square, allowing the stones to work on each other under the traffic, and did not make a good macadam road. In Liverpool, a mixture of broken stone and coal tar pitch is laid—one ton of pitch that will just run at 100°Fahr., is mixed with 70 gallons of dead oil, and added, hot, to 5 cubic yards of stone; the mixture is then rolled with a hand roller in short lengths. In Scotland, a concrete has been used, with Portland cement for a binding, but the author says, when it begins to break up, it falls to pieces fast. In Paris, the macadam is spoken of as unsatisfactory, and with all the resources at command, the roadway after it is given up to traffic in the morning, "becomes an ocean of mud, or a mass of infected dust." Comparing the two systems, the author thinks the roads in Paris are better as regards binding than those in London, which binding is said to be an element of weakness to the latter, though the London roads are better compacted. A section is given showing the pavement of the Fifth Avenue in New York, which is 40ft. wide. The diagram shows 8in. of Telford or rubble as a foundation, 4in. of 2½in. trap, 3in. of 2in. stone, 1in. coarse screenings, and ½in. fine ditto. The gutters are 4ft. wide on each side, and formed of trap blocks. These roads are highly esteemed. The superiority of the American Macadam roads is attributed partly to the greatee amount of work put upon them; "the binding, which is of the same hard material as the metalling, almost completely fills the interstices between the stones, and the entire mass is thoroughly compacted and nearly homogeneous." The puddling gives a smnoth, firm, and hard surface, and the steam-roller greatly aids in compacting the stones; only frost is found to injure the surface. Many useful hints follow respecting the maintenance of roads. In Paris the author says the maintenance of roads is more effective than in London. It consists essentially in washing rather than sprinkling them, most of the work being done during the night. The cost of maintaining the surface of Regent-street in London—one of the best macadamised roads in the kingdom—according to Mr. Howell, surveyor of St. James's, is quoted as being 3s. 7½d. per square yard per annum. The author, however, states that the accounts of the cost of repairs to London roads are not accessible—a statement that may be taken into consideration by the vestries with profit to themselves.

Another portion of the paper before us is devoted to detailed particulars of various kinds of pavements. Among them we notice stone and wood pavements, asphalte and bitumen, compressed asphalte, asphaltic mastic, bituminous mastic, tar mastic, &c. The various processes are discussed at length, but we cannot afford space to give the author's opinions here. He observes, speaking of stone pavements, that the best are found in England. In the better class of those found in London the sets are 3in. wide, with parallel sides, and set in blue lias lime grout, Aberdeen granite being preferred as it wears rough. The total life of these pavements, as quoted from Mr. Haywood, is 29 years. The paper contains some useful appendices, with extracts from specifications, contracts, &c., and good illustrations of the Gellerat, Lindelof, Ross, and Aveling rollers.

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LEVELLING BY THE AID OF PERSPECTIVE.*

IT is not generally known that the law of perspective by which the size of an object diminishes as it recedes from the observer's eye has been turned to account in estimating distances in levelling operations on a large scale. Yet, notwithstanding the fact, and that some telescopes for range-finding are constructed on this principle, it is equally true that the surveyor measures all his distances by the chain in his ordinary practice, and neglects to make use of a very reliable law of distance which would save him an immense amount of labour, and the inaccurate results arising from the employment of careless chainmen. Mr. W. H. Wells, C.E., of the Bengal Public Works Department, has written a short treatise on the subject, by which he shows how the simple law of perspective can be accurately applied to the reading of distances in levelling operations, and the chain dispensed with altogether by a contrivance affixed to the level. In the first part the author very clearly shows that the size of the staff seen in the telescope, as its image increases or diminishes with the distance, may be made to indicate in an unerring manner the actual distance of the staff from the instrument station. We think we can make this clear to the reader without a diagram. If a staff at a 100ft. distance from the telescope of the level appears to occupy 1·80ft. in the diaphragm, or is bounded by the cross hair at the centre and by the edge of diaphragm at the bottom, we have a scale of diminution by which any distance may be judged in proportion to this half-diameter. The foregoing scale can be readily made by measuring the 100ft. distance accurately, setting up the staff, and carefully observing or reading the portion of the staff within the vertical space of the diaphragm. To find any other distance is a simple matter of proportion. If the staff image contained within the vertical space is 3·20, then we have as 1·80 : 3·20 : : 100ft. = 177·77ft., distance of staff, and so on. It is only necessary for the surveyor to note carefully his own datum at a certain distance and read image of staff to insure accuracy. At each observation for levelling he has simply to read the portion of the staff image contained within his "vertical height," which he can determine for himself. On this system the distances are worked out by simple proportion sums when the level-book is made up, and a form is shown for this purpose. The distances entered will, of course, be entered in columns headed respectively "back" and "fore" sights. As remarked by the author, in levelling on rough and intricate ground, the distances read will be more reliable than those measured by the chain, and in running a line of levels by this method the surveyor only needs someone to hold his staff for him. Mr. Wells proceeds to show how the principle can be extended by adding a diaphragm to any instrument, by which means it is not necessary to work out the sum of proportion. We may here quote him:—"If the vertical space is exactly formed to take the 1ft. of the staff image at 100ft. distance, it is evident that, with such a datum, no proportional sum is necessary to find the distances, but they can be read off the staff-image at once and noted in the level-book. For instance, if the portion of the staff-image inclosed is found to be 0·50ft. the distance would be 50ft., and so on. Such is the application of the principle I am advocating in Edgeworth's stadiometer and Gravatt's level, where the vertical space is formed by two spider lines placed horizontally, at such distance apart, that when the telescope is placed exactly 100ft. from the staff the portion of its image inclosed between the lines is exactly 1ft." Mr. Wells next suggests an improvement on Edgeworth's stadiometer, namely, that an arrangement attached to the diaphragm be made by which the vertical space can be regulated in depth by the surveyor by means of a thumb-screw either below or above the diaphragm of the telescope. By this means the surveyor can use one, two, or more whole feet of the staff image as the datum for 100ft. by diminishing or increasing the vertical space—the larger the datum space the greater the accuracy of the readings. The author shows also how the distance across a broad river may be found by this means of adjustment. Part III. of Mr. Wells' treatise discusses the advantage of having a scale of equal parts adjacent to the above mechanical contrivance so that a point attached to it will move along the scale as the space is increased or decreased and thereby measure the space. A very neat instrument of this kind is described, made by Messrs. Elliott, of the Strand, the telescope of which has an arrangement attached whereby two cross hairs in the diaphragm are regulated in distance apart, and the scale is arranged so that a man's height which is fixed at a certain average at any visible distance is inclosed exactly within the hair lines, and the distance to the object is given on the scale. The suggestions made by the author can readily be carried out, and he shows how a contrivance can be applied and adapted to existing instruments by any optician. Mr. Wells, to meet the difficulty that would arise from sending instruments for additions to their diaphragms, suggests a simple appliance that can be inserted by the surveyor himself to enable him to read distances by the above method. A contrivance has been suggested to Messrs. Elliott Brothers, opticians, which can be inserted in any levelling telescope, and that firm are, we believe, prepared at a small cost to supply it to surveyors. We would throw out the hint here that the principle might be extended to obtain the heights of objects when the horizontal distances were known. We heartily commend to the attention of surveyors the remarks on field-books; the author very truly says the old form of level-books giving five columns is unnecessarily tedious, and he recommends the simpler system of keeping the readings of the level heights in one column, a practice already adopted to some extent. The example given shows the page ruled with three columns to the left, the first being for "distance," the second for "level readings," and the third for "reduced levels." The "back," "intermediate," and "fore" readings it will be observed are all entered in one column, the only precaution needed being to draw a line under the last foresight; each time the instrument is moved to take a backsight. Mr. Wells' "Hints" deserves a wide circulation among surveyors as an important step towards the simplification of levelling operations and field-work generally.

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INCOMBUSTIBLE WOOD.

M. P. FOLBARRI claims that he has discovered a method by which wood of any kind can be rendered incombustible. It becomes, as it were, petrified without any alteration in appearance. Intense heat chars the surface, slowly and without flame, but does not penetrate to any extent, and leaves the fibre intact, whereby in case of fire the firemen would have no occasion to fear that the materials on which they tread would give way beneath them, if this operation has been undergone by the wood composing the staircases, floors, &c. The following chemical compound is said to produce the result: Sulphate of zinc, 55lb.; American potash, 22lb.; American alum, 44lb.; oxide of manganese, 22lb.; sulphuric acid of 60°, 22lb.; water, 55lb.; all of the solids are to be poured into an iron boiler containing the water at a temperature of 45° C., or 113° F. As soon as the substances are dissolved the sulphuric acid to be poured in little by little, until all the substances are completely saturated. For tho preparation of the wood it should be placed in a suitable apparatus, and arranged in various sizes (according to the purposes for which it is intended) on iron gratings, care being taken that there is a space of about half an inch between every two pieces of wood. The chemical compound is then pumped into the apparatus, and as soon as the vacant spaces are filled up it is boiled for three hours. The wood is then taken out and laid on a wooden grating in the open air, to be rendered solid, after which it is fit for uses of all kinds, as ship-building, house-building, railway carriages and trucks, fence posts, wood paving—in short for any kind of work where there is any liability to destruction by fire.

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* Hints on Levelling Operations, &c. By W. H. Wells, C.E., Bengal Public Works Department. London: E. and F. N. Spon, Charing-cross.

PARLIAMENTARY NOTES.

The East India Museum.—In reply to Mr. Grant-Duff, Mr. E. Stanhope said, on Monday, it had been decided to remove the collection in the East India Museum, with a view to increasing its utility; and a committee was at present communicating with the authorities of the British Museum and Kew Gardens as to its disposal. It was believed that the economic section could be placed with great advantage in the hands of Sir J. Hooker at Kew; and it was also considered desirable to place the zoological, technological, and art collections in museums where they would be more generally seen and appreciated. The change would secure an ultimate saving to the revenue of about £9,000 a year.

Crowded Churchyards. — Sir G. Jenkinson asked the Home Secretary whether his attention had been directed to the numerous churchyards in England which were full, and therefore unfit for further interment in them; also that the number of these was constantly increasing, without any adequate remedy to abate this evil being applied by the parishes so circumstanced; whether he would grant a return in a tabulated form of the various parishes in which the above was the case; and whether the Government intended taking any, and, if so, what steps, without delay, to compel the parishes where such a state of things existed to provide a remedy by the enlargement of the existing churchyards or otherwise. Mr. Cross—I have no doubt that a considerable number of churchyards are full. Some time ago it was found that such a return as that desired could only be obtained at an expenditure of £5,000 or £6,000; and we did not feel justified in incurring that outlay. I have no power when a churchyard is full to enlarge it or to close it; but I hope that this question will in future be treated as a sanitary matter, and that something will be done to remedy the inconvenience complained of.

The Artisans' Dwellings Act and the Metropolis.—Mr. Fawcett asked the Chairman of the Metropolitan Board of Works whether, as it had been stated that the loss caused to the metropolitan ratepayers by clearing six sites under "The Artisans' and Labourers' Dwellings Act, 1875," will be over £550,000, he could inform the House if any estimate had been formed of what would be the entire loss to the metropolitan ratepayers from carrying out this Act in the metropolis; whether any representation had been made by the Board to the Home Secretary with a view to such an amendment of the Act of 1875 as would diminish the cost of carrying it into operation; and, if such representation had been made, what was the reply received. Sir J. M'Garel Hogg—It is impossible to say what will be the entire cost to the metropolitan ratepayers of carrying out the Artisans' and Labourers' Dwellings Act, as there are many cases before the Board in respect of which schemes have not yet been prepared nor estimates made. Up to the present time, of 14 schemes approved by Parliament, the loss on the six sites referred to will be £562,061, while that on the remaining eight is estimated at £514,409, assuming that the prices received for land equal and do not exceed those already offered. The whole matter is under consideration by a Committee of the Board, who propose to make a representation to the Secretary of State, with a view to an amendment of the Act.

CHIPS.

At the Halifax Town Council meeting Colonel Akroyd offered to hand over Shroggs Park to the corporation, and it is expected that this recreation ground will be thrown open to the townspeople. Through the generosity of Mr. Saville, lord of the manor, the land which lies on the north side of Halifax was placed at the disposal of Colonel Akroyd, who was thus enabled to expend several thousands of pounds upon its laying out before dedicating it to public use.

The Alexandra Theatre, Liverpool, (the foundation stone of which was laid by Mlle. Titiens, in 1866), has just closed, and will not be opened again till Oct. 20th, during the interval it is to be entirely gutted, and reconstructed from the designs and under the direction, of Mr. C. J. Phipps, F.S.A, of London. Messrs. Jones and Sons, of Liverpool, are the builders.

Building Intelligence.

Battersea.—The Old Vicarage House of St. Peter, Battersea, being too small for its purpose, has been considerably enlarged in accordance with plans approved by the Ecclesiastical Commissioners for the Rev. John Toone. The materials used are stock bricks for the walling, red bricks for quoins, strings, &c., and the roofs are covered with green Westmoreland slates and Cooper's ridge tiles. The windows have mullions and transomes of Corsham Down stone. The work has been done by Mr. W. H. Williams, builder, of 32, Meyrick-road, Clapham Junction, from the designs and under the supervision of Mr. E. Swinfen Harris, jun., architect, of 32, Craven-street, Strand, and Stony Stratford.

Brailes.—A new church at Winderton, in the parish of Brailes, was consecrated on the 19th ult. Mr. W. Smith, of John-street, Adelphi, was the architect, and Mr. Attwood, of Brailes, the builder. On the 20th ult., the parish church of Brailes, which has been restored by the same architect and builder, was reopened. The cost of the restoration was £4,550. The parish church, dedicated to St. George, is one of the largest churches in the county of Warwick, and is worthy of its ancient name, "The Cathedral of the Feldon." It consists of a large chancel, a nave six bays in length, with north and south aisles, a Western tower rising to a height of 120ft., and a south porch. The old 14th century roof of the chancel still exists, but the boarding of the panelled ceiling to it was so decayed it had to be renewed. The old mouldings and carving has been preserved and refixed. All the old roof of the nave has been taken off carefully and thoroughly repaired and replaced and covered with lead. The old 14th century roofs of the aisles were, with the exception of one principal, destroyed about 40 years ago, and renewed, but not in accordance with the old design. The north wall of the nave had been rebuilt in the 17th century, with semi-Classic details to the arcade and with miserable clerestory windows. All this has been restored to its ancient form. All the old pews (with one exception) have been cleared away, and opened seats provided. The church seats, and all the doors, are executed in oak. A new carved oak pulpit, on a stone base, is placed against the north pier of the chancel arch, and a brass lectern has been provided. The sacrarium has been laid with Minton's tiles, and several of the patterns are reproduced from fragments which were found in the church. All the old plaster and whitewash has been removed from the walls, and the old stone has been cleaned and re-pointed. In the north aisle there is placed a very fine old 15th century oak chest, with an elaborately carved front. The church is lighted with lamps suspended from the arches, and is warmed by Perkins' system of hot-water pipes.

Blackburn.—A new feature has been introduced into St. Joseph's Church, Blackburn, in the shape of an Altar of the Blessed Virgin in the southern transept. It is entirely executed in a combination of marble, alabaster, and fine white stone. The altar is of the ancient sarcophagus form with arabesque carving. Above, reaching to the upper part of the chapel, is a reredos. The lower portion includes three niches divided by pilasters with Corinthian capitals, and within the niches are statues of the Blessed Virgin, St. Bernard, and St. Alphonsus. Above the cornice which stands over this portion of the design rises in the centre an upper niche in which is a statue of the Archangel Gabriel, and a broken pediment crowns the whole design at an elevation of over 17 feet. The design is by Mr. Goldie, of the firm of Messrs. Goldie and Child, of London, the architects of the church, and Mr. Sharret, the sculptor, of Preston, has carried out the work.

Burslem.—A valuable addition has been made to the borough by the erection of the new vegetable market, which has just been completed. The building is one of the finest of its kind in the Pottery district. The roof is of curvilinear form of wrought iron, and is supported on twin columns with ornamental capitals. On the crown of the roof is a lantern light running the whole length of the building, and affording means of ventilation. The area covered is 1,800 square yards, of which 420 is covered by six shops abutting on Queen-street, the total length of frontage in this street being 125ft. The roof already referred to is one large span. A light and elegant appearance is given by the glazing, which is done on the patent method invented by Mr. W. E. Rendle, of Westminster-chambers, London. The great advantage is that it entirely dispenses with the use of putty or other cement, and no painting is required, and some small vertical tubes take the place of the large and heavy sash bars used on the old system. The contractors for the brick and stone work are Messrs. J. and R. Inskip, of Longton, Messrs. Hill and Smith supplying the iron roof. The market will cost £25,000. The whole work has been carried out under the superintendence of of Mr. E. M. Richards, the borough surveyor, who also designed the building.

Chesterfield. — The Stephenson Memorial Hall, Chesterfield, was opened on Monday. Messrs. Smith and Woodhouse, of Manchester, were the architects. The style of architecture is Gothic, of simple detail. The building is faced with red brick, relieved with stone dressing from Sir Joseph Whitworth's quarries at Darley Dale. The roofs are covered with Welsh blue slate, capped with ornamental red ridge tiles. The public hall measures 68ft. in length, 46ft. 6in. in width, and is 40ft. high to the ceiling. In the body of the hall chairs are provided to seat 500 people. Messrs. Chadwick & Co., of Masbro', were the contractors.

Glasgow.—The building of the new Central Theatre, Glasgow, is progressing rapidly. In the Italian style, the building when completed will be four stories in height, with basements and attics in addition. There is a frontage of 144ft. to Sauchiehall-street, 96ft. to Renfield-street, and 145ft. to Renfrew-lane. The height of the building above the foot pavement to the top of the balustrade which finishes the front elevations will be about 66ft. The elevation of the street or shop story, 15ft. in height, consists of iron standards and massive stone piers, while those at the main entrance are of polished Peterhead granite, and have moulded bases and caps, which are surmounted by a frieze and cornice. When first designed the building was to have had a large hall, extending behind the shops to Renfrew-lane, but after the burning of the Theatre-Royal overtures were made to the directors to convert this part of the block into a theatre. The directors, after a careful consideration of the subject, resolved on the construction of a theatre instead of the larger hall first intended, and, with the view of taking advantage of all the most modern improvements in the construction and arrangement of such buildings, commissioned Mr. Frank Matcham, of London, to arrange the interior of the intended theatre and its adjuncts, in conjunction with their own architect, Mr. James Thomson, I.A., St. Vincent Street, under whose superintendence the whole works are being executed. The theatre will accommodate about 2,000 persons.

Metropolitan Board of Works.—At the meeting of this Board on Friday, a deputation from inhabitants and owners of property in Stockwell and Brixton, headed by Alderman McArthur, M.P., presented a memorial on the subject of the floodings from which the district has suffered several times since last autumn. The memorial pointed out that while the sewers in this district are large enough for ordinary purposes, they were insufficient in seasons of heavy rainfall, and urged the Board to take early steps to prevent the recurrence of these disastrous floods. The memorial was referred to the works committee, as was also another from the Vestry of Bermondsey, urging the Board to expedite the commencement of the metropolitan improvements authorised to be carried out in Tooley-street, Dockhead, and Bermondsey. The vestry of St. Luke having again applied for a further loan of £69,000 for the completion of the Golden-lane improvements, and having also rescinded the resolution passed by them on the 24th September, 1878, expressing the approval of the conduct of Mr. Storey, their late representative, with regard to the purchase and sale of property in the parish required for public improvements, it was agreed to grant them a temporary loan of £40,000 for two years, satisfaction being expressed that the vestry had purged itself. The engineer to the Board recommended that the improvement at the Angel, Islington, be carried out by the Board's general contractors, Messrs. John Mowlem and Co., and the matter was referred to the works committee, with power to act. A letter was received from Sir Henry A. Hunt, transmitting a copy of his final award in the Pear Tree-court (Clerkenwell) Improvement Scheme, under the Artisans' Dwellings Improvement Act, 1875.

Oldham.—An addition to the Oldham Workhouse has been opened. The new buildings comprise three blocks consisting of two pavilion wards and an administrative building in the centre. Each pavilion is two stories high and contains in each story a ward 84ft. by 24ft., with a total accommodation in all the buildings of 150 beds. There is also a day-room to each ward 24ft. by 24ft., a scullery, bath, and nurses' rooms. The warming and ventilating have been intrusted to Messrs. Shillito and Shorland, of Manchester, who have very successfully carried out their arrangement by means of their patent Manchester open firegrates, which pass volumes of pure warm air into the wards, and Shorland's patent vertical pipes, which supply an unlimited amount of cold air without draught; the combined arrangement being that the air of the wards is regulated to any desired temperature. The walls are faced with pressed bricks inside, painted and distempered in pleasing colours, having a dado 4ft. high round the rooms. The cost of the buildings will be about £12,000, and the general contractor is Mr. E. Whitaker, of Oldham. The whole of the work has been erected from the designs and under the superintendence of Mr. Edward Potts, architect, Oldham.

Renfrew.—The police committee of the county of Renfrew have given instructions to Mr. Davidson, architect, Paisley, to except estimates for, and proceed with the erection of police-station buildings at Bridge of Weir and Newton Mearns; these being the first two of a number of similar building they propose to erect throughout the county. Previous to estimates being taken the plans were submitted to the Home Secretary and approved of. The outside of the buildings are in the Scotch style. Owing to the reduced value of labour and materials the estimates given in are rather under the probable cost stated by the architect when the plans were submitted.

Sutton Coldfield.—A new Congregational chapel is about to be erected at Sutton Coldfield, from plans by Mr. George Ingall, of Birmingham. The church is designed for 636 sittings on the floor and the gallery, and will have clear external dimensions of 78ft. by 40ft. The portion of the building included in the present contract will provide about 300 sittings on the floor and 100 in the end gallery. The church will be of Gothic design, faced with pressed bricks and Bath stone dressings. The gallery entrance and staircase are to be in the tower, which forms the south-east angle of the structure, and is to be surmounted by a spire rising to a height of over 100ft. from the ground level. The roof will be partly open-timbered, carried on hammer-beam principals, and the whole of the interior fittings are to be stained red deal. The architects are Messrs. Ingall and Hughes, Temple-row West, Birmingham; and the contract for the first portion of the church and vestry is taken by Messrs. Horsley Brothers for £2,128.

CHIPS.

On Tuesday week the first section of the East Norfolk Extension of the Great Eastern Railway system—from Wrexham to Coltishall and Buxton Lamas—was opened for traffic. The construction of the extension from Buxton to Aylsham is being rapidly pushed forward.

A piece of wall-painting was dug up in Dyer-street, Cirencester, last week. It has been carefully cemented at the back and framed, and is to be placed in the Corinium Museum in that town. It is believed that it is a portion of the wall of one of the rooms whose beautiful pavements discovered in the same locality 30 years since form the chief ornaments of the Cirencester Museum of Roman Remains.

The town council of Great Yarmouth have adopted plans for a new police-station, cells, and chief constable's residence, prepared by the borough surveyor, and have empowered a committee to accept a tender for the same. The estimated outlay is £1,500.

The town council of Tenby have adopted plans, prepared by their borough surveyor, for the completion of the sewerage of that town, and have applied to the Local Government Board for sanction to carry the same out, and to borrow for it the sum of £7,100.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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Cases for binding the half-yearly volumes, 2s. each.

Received.—D. H. and Co.—J. W. and Co.—M. H. and Co.—A. H.—G. V.—H. W.—J. A. and Son.

An Old Mason. (Your sketch of old church arcading shows a by no means common mode of junction of nave and tower arches. Certainly not a desirable one, as when the arch is made to spring in the way shown there is an unpleasant weakness apparent in the pier. We do not like to say it was a blunder on the part of the old masons, though probably it was. Sketch S is the proper construction.)—T. Hedges. (We cannot insert anonymous letters.)—G. J. S. (We have heard of the "silicate paint," but do not know of the "silica" preparation you speak of. The former is suitable for all purposes of wall painting, and the paint may be obtained from the works, Charlton. There is also a "soluble silica" used as a preservative of stone.)—Goth. (Moulded caps without carving were prevalent during the early part of the 13th century. The simple moulded capital may be seen at Tintern, Netley, and other buildings. The dove used as a corbel would not be orthodox in any style.)

"BUILDING NEWS" DESIGNING CLUB.

Jug. (A bath-room would be an acquisition if it can be provided economically.)

Correspondence.

THE NEW ROAD AND PROMENADE, RAMSGATE.

To the Editor of the Building News.

Sir,—Prolonged absence on the Continent on business has prevented us from taking earlier notice of a letter addressed to you on the 1st inst. by Mr. W. V. Green, of St. Lawrence-on-Sea, inclosing copy of letter from him which he stated had been read before the Commissioners.

Being the authors of a design by which it is proposed to cross Harbour-street on the level, we therefore assume that ours is one of those which is under reconsideration. And as Mr. V. Green makes a suggestion in his letter that by adopting certain structural alterations he considers his design would be the most suited to the purpose, these alterations, comprising part of the essential characteristics of our scheme, and being in no way whatever implied or indicated in his very original and peculiarly impracticable one, we should feel obliged by your insertion of these remarks, which we will confine to as limited a space as possible, that the publicity he has obtained in your widely-circulated and influential journal may not lead your readers to an ill-founded conclusion. We have not the honour of the knowledge of the existence of any such engineer (?) as Mr. Green, or of his design, however great or lesser prophet he may be, and entirely repudiate the insinuation that the lines of route indicated on our drawings are in any way attributable to inspiration from him. The route having been selected by us after a careful personal inspection of the locality, and laid out in conformity with the instructions issued by the Committee, and what appeared to us to best meet the requirements of the case.

Assuming that the description he gives of the seaward portion of his scheme is naturally a correct one, we should not at all be disposed to think that any amount of prophecy would compensate for such an absence of engineering, or even common-sense capacity, as is indicated by the fact that he would seriously propose to such a responsible corporation as the Commissioners of the town of Ramsgate that they should adopt any scheme so devoid of a practical knowledge of engineering contingencies as that implied in his proposition to bracket a large portion of an important public road and promenade for a considerable width from the face of a cliff of such an uncertain character as chalk, and that without any other means of external support. Perhaps his power of prophecy may even go beyond the ordinary limits of the older prophets, and he may add to such power the gift of performing miracles, thus being enabled to achieve stability where no engineer (?) not educated in the school of prophecy would attempt the development of a scheme which might ultimately give occasion for the exercise of a miraculous intervention to prevent serious disaster. Proceeding to a more serious consideration of the designs in question, we would particularly wish to direct your attention to the following paragraph contained in Mr. V. Green's letter:—"In order to comply with the instructions, and interfere as little as possible with the Military-road, my working drawings show portions of the pavement of Sion Hill and of the new road opposite thereto supported by cantilevers. If, however, the Board of Trade will permit, as no doubt they will, the placing of a few iron columns where the stone posts now stand at the edge of the Military-road, such cantilevers may be dispensed with." We may remark that our design specially includes an arrangement similar to that for the first time suggested by Mr. V. Green in the above paragraph, and it is obvious to anyone that our scheme is the only feasible one of the two. We, therefore, object that Mr. Green, having submitted a design embodying a totally different and impracticable method of construction, is not justified in his endeavour to substitute for what appears to be the most impracticable part of his scheme, an arrangement which he has not even suggested in the first instance, but forms one of the essential features of that of a competitor, any more than we should dream of claiming such wonderful gradients as he has asserted can be obtained by the adoption of his design, a glance at the Parliamentary section being sufficient to show that even if such gradients could be obtained without inconvenience to the adjoining houses, or serious alteration of gradients in adjacent street approaches, would involve such departures from the Parliamentary levels as would necessitate the exceeding of the vertical limits of deviation allowed by the Standing Orders of Parliament.

Of course, as Mr. V. Green withholds his motto, it is a matter of uncertainty which design of the vast number submitted in competition claims the honour of his paternity. We are therefore dependent entirely upon his letter and the published plans for information.

Apologising for the length of the above, which we consider necessary to protect, not only our own interests, but those also of fair competition,—We are, &c.,

Via Melior Iter Brevius.

London, July 14th.

COMPETITIONS.

Sir,—I am surprised that architects do not forswear all competitions where the selection of the premiated drawings is not left to a professional judge and the conditions not absolutely enforced. Mr. Tarring's letter refers to one instance (of many), where a design submitted could not be carried out for the amount placed at the disposal of the competing architects, yet the author receives the commission, to the exclusion of more straightforward competitors. All designs which do not observe the conditions of a competition should be at once ruled out.

An instance occurs to me. In a competition for cemetery chapels, &c., in Lancashire, the amount (inclusive) was fixed at £5,000. From the drawings submitted two sets were premiated. The local authorities were told on competent and disinterested authority that the cost of carrying out the first selected design would be nearly double the amount stipulated. The "authority" thereupon went into a temper, talked about "dictation," claimed that "they knew their own business best," and gave the architect the commission. The result is they *have* spent nearly £10,000, as any professional adviser would have anticipated. Several similar cases have occurred in the county to my knowledge.

A union of competing architects would do a good work if by them the legality of selections against the plain wording of the conditions of competition could be tested. Common-sense would lead one to suppose that an action could be maintained.—I am, &c., J. R.

CITY OF LONDON SCHOOL COMPETITION.

Sir,—In your notice of this day's date of the designs for the above, reference is made to the anonymous circular which has gone the round of the Corporation, and although it is not stated openly that I sent it, the inference is that I know something about it. Allow me, therefore, most positively to deny all knowledge of it. I have had nothing whatever to do with it, and you have my authority to pledge me to the payment of one hundred guineas to any charity which the Schools Committee may name if it can be proved that I promoted it, directly or indirectly.—I am, &c., T. E. Knightley.

106, Cannon-street, E.C., July 11.

THE GLOUCESTER ASYLUM COMPETITION.

Sir,—In reading your notice of the Gloucester competition last week I could not help feeling that the action of the magistrates in placing the designs of architects before a clerk of works for examination is very derogatory to the profession generally, and is only one more instance of the effect competitions have of lowering the profession in the estimation of the public. That the magistrates have no very high opinion of it is evident, and it would be interesting to know what they would themselves think if they were to experience similar treatment to that received at their hands by the competing architects.

If the magistrates feel unable to adjudicate themselves without professional assistance, the ordinary course, as adopted in other competitions, would be to appoint an architect to report to them on the designs.—I am, &c.,
A Looker-on.

BUILDING ACT PROVISIONS—PARGETTING FLUES—JENNINGS v. DUNCAN.

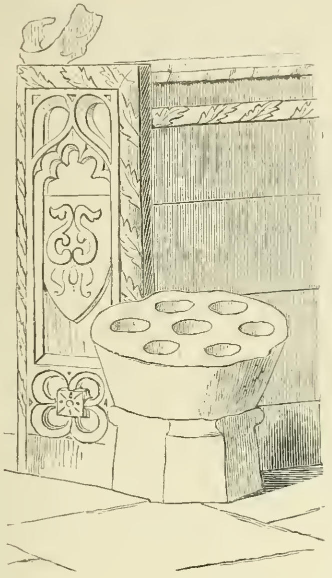
Sir,—The report of this case may, I think, induce builders to resist pargetting the outsides of flues, although the Act of Parliament (with all due deference to the Chief Justice) says it shall be done. For many years past it has been my custom to have the outer surfaces of all flues pargetted from the under sides of joists to the top lines of skirtings, and from the under sides of topmost ceiling to the level of slates whilst the walls are being carried up, the cost being insignificant, and the saving of future trouble and expense important.

That smoke frequently finds its way out behind the skirting-board is the experience of all owners of house property: tenants become alarmed, have fears of the premises being on fire, the skirting-board has to be taken down, paper, paint, and decoration damaged, and rendering or pargetting, after all, has to be done. Why not, therefore, do it in the first instance, and avoid vexatious expense? taking care that it is kept intact, and not destroyed by the carpenter fixing his short joists or turning pieces, the joiner driving in his plugs, or the bellhanger mutilating it.

I ask compliance with this rule, and say that on grounds of economy builders will find their account in its observance; but if I am met with opposition I will enforce the third paragraph of rule 17, section 20, and will have no woodwork of any description nearer to a flue than two inches unless the supersurface is rendered or pargetted, and will apply this rule to joists, rafters, slating battens, floorboards, laths, skirtings, and stairstrings, so important, in my belief, is the external surface rendering to the protection of the fabric against fire.—I am, &c.
T. E. Knightley.

THE STONE AT LEWANICK.

Sir,—This stone possesses much interest. I send you a perspective view, made about four years since, which will give a clearer idea of it. Mr. Micklethwaite's explanation I had heard before from others, and also that the number of holes was symbolical of the Seven Churches of Asia. But how could it be intended for lighting purposes when the height to top is only 1ft. 9in. from ground? It would have been a much better plan to have had cups of iron on the top of sticks, similar to what were carried about, than to have carved and polished a slab of granite which set so low would be inefficient for illumination, and awkward and dangerous. Besides, why should light have been required at all, and why more in this church than a thousand others? I have during the last forty years visited a great number of old churches, but never met with another instance of such a thing. The example at Westminster, in niche, though high enough to afford light, it seems to me, was as likely used—as it possesses a flue—for heating food.



On the brow of the hill at Lewanick, away from the village, is another antiquity of interest—the remains of a cross. The cause of erection is unknown. I would direct the attention of visitors to this neighbourhood to the great number of wayside crosses scattered about. Possibly they were landmarks of ecclesiastical property, or might be intended to direct pilgrims to the numerous holy wells for the which the county is remarkable. On the Lower Basil farm, St. Clether, are several of these crosses, and also one of the wells with remains of a chapel built over it. The farm residence, which is worth notice, was a manor house of the Trevelyan family. The genial-minded farmer, Mr. Fenning, will, I am sure, be happy to point out the local antiquities of the place to visitors. The crosses alluded to will, I fear, be soon improved away. One, I sought, I found had been laid down by a cottager to make a doorstep to his scullery.—I am, &c., M.

PLANS OF FARM-BUILDINGS AT THE KILBURN EXHIBITION.

Sir,—The thanks of the competitors are due to you for drawing attention to the recent *fiasco* at Kilburn.

It appears to me that the council are much to blame for issuing such vague instructions. So early as March last the attention of the secretary was drawn to the absence of sufficient information in the conditions, that no locality was specified, nor schedule of prices furnished, and that as the prices of materials and labour vary so much in different counties, the estimates would be worthless and tend only to mislead. It was also especially observed that as detailed specifications and bills of quantities were required the competitors would be put to great expense, and that it would be a great hardship to be disqualified solely on the ground of cost. There was then ample time to amend the conditions, but nothing was done; we suffer in consequence, and some of us have the unprecedented honour of being commended in one sentence of the report for that which is practically declared to be worthless in the next.

But to my mind the greatest injustice to the competitors was the closing of the building in which the plans were deposited during the three first (and best) days of the show, thereby preventing visitors most likely to be in a position to reward us for our labour from inspecting our work. Some, perhaps, will console themselves that we are treated no worse than those fifty-six competitors at the Cardiff show who exhibited plans of farm cottages, and in like manner were all disqualified; but it is curious to note that Mr. Thomas Sample was one of the judges on both occasions.—I am, &c., Parterre.

Sir,—Judges at exhibitions, such as that just concluded at Kilburn, are not expected to be infallible, or to please everybody. But, when they violate conventional and recognised rules, they must expect to be amenable to public animadversion and rebuke. Such, I apprehend, and it is the opinion of scores besides me, is the position in which the judges on the plans of farm buildings have placed themselves.

In declining to award any prize for the reason assigned, viz., that "there are none of the plans combining superior arrangement of details with that economy of cost which is essential," may be correct as regards most of the plans; but an examination of a few of these would have convinced any practical man that every apartment and "detail" requisite for a farm had been efficiently provided for.

A few of the plans, however, have met with the quasi-approval of the judges. It is on these I have to offer a few strictures. I shall confine my remarks, in the first place, to the "commended" plans.

Dealing with them in a general way, I would observe that in every one of them the straw-barn is placed either on one side of the buildings or otherwise inconveniently so. Some of them have either badly situated, or too small, root-sheds, or are totally devoid of them. Hardly one has more than one loose box, and some of them none. The latter is the case for a farm of 150 acres, where stalls for 12 horses and 10 cows are erected. All have open, or partially uncovered, yards, and not one provides for a w.c. for the servants. But perhaps one of the most objectionable plans in the room was the one which met with "high commendation." While it savoured more or less of the defects of the "commended" plans, some of its shortcomings are more glaring. It affords room for 112 cows, but inadequate sheds for young, or store cattle, and these are partially uncovered. For all that stock the root-house is only 20ft. by 20ft., and it has no doorway for carts to empty the roots; but that would be rendered impracticable by the circumstance that the passage to and in front of it is only 10ft. wide, which no horse could turn a cart in. There is only one loose box, where a cow at calving, or a mare at foaling, and afterwards accommodated, could be turned in. For all this stock the straw-barn is only 40ft. by 20ft.; but the planner has made up for this and other stint room by a liberal allowance for some 50 pigs. There is a wide gangway in the middle of the building intended for a direct passage from the front to the back, but our "highly commended" architect (?) has inadvertently, and no doubt unobserved by the sage judges, planted down the barn midway, which, of course, forms an effectual barrier. Further comment is unnecessary. The judges may be clever at superintending sewage works, and the like, but they were incompetent for the work they took in hand.

According to the all but universal opinion of practical and representative men in Scotland and elsewhere, whose attention has been devoted to the subject of farm architecture, they are at one as to the necessity of covered yards for cattle. But our Exhibition judges do not seem to have been aware that such buildings were in existence, or that anyone whose opinion was worth having had studied the matter, and their patrons, the directors, seem to have been equally oblivious and culpable in this great branch of agricultural industry.—I am, &c., Agricola.

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Intercommunication.

QUESTIONS.

[5823.]—**Ammonia Stain.**—Will any of your readers kindly inform me how to stain deal with the foregoing stain, and the best kind of varnish to use afterwards?—R. O. B.

[5824.]—**Damp Inside Wall.**—The walls in the hall of a mansion erected seven years ago were plastered in Portland cement in imitation of Ashlar, and have a hard polished surface. In damp weather water trickles down them on to the floor. They never got any coating since the trowel left them. I shall be greatly obliged if some correspondent will tell me the best remedy?—Tyrone.

[5825.]—**Architect and Client.**—I should be obliged if some reader of the Building News would give me some information on the following point:—About three months ago I was instructed by a client to prepare plans, specification, and quantities for a house to cost about £800, which was done, and tenders obtained; but my client, hearing that I had included 2 per cent. as "surveyor's fees," which he considers was not right, has resolved, without consulting me, to take the works altogether out of my hands, and is now negotiating with some builders to see if the work cannot be carried out without my supervision, but, so far as I can hear, *my plans* (which, by the way, were left in my client's custody for consideration when I last saw him) *are to be carried out.* I might add that my client holding a copy of the printed quantities, which did not in themselves show a sum to be included as "surveyor's fees," the contractors were asked *by letter* (unknown to my client) to include the sum of 2 per cent. to be paid to me as usual, believing that to be a proper course. I shall be glad to know what is the best course for me to take in the matter, and what I should be justified in recovering from my client for the work I have done?—Anxious Inquirer.

[5826.]—**Half-Timbered Work.**—What is the best form of construction for half-timbered fronts in exposed situations, the walls up to first-floor level being built of brick? Would oak or red pine be best for the purpose?—South Coast.

[5827.]—**Tour.**—Could any of the readers of the Building News inform an intending tourist of any places of interest (architectural and geological) from the North of Derbyshire along east coast as far south as London, thence across to Wales and along west coast to Chester? Any suggestion for deviating from above course would also be very thankfully received.—Pedestrian.

[5828.]—**Modelling.**—I should very much like to commence modelling in plaster, but do not know how. Would some one acquainted with the subject kindly give one some information as to the necessary tools, cements, casts, and other requisites, and cost of same, also if there be any cheap work on modelling?—Amateur.

[5829.]—**Measuring Spire.**—Will any practised sketcher inform me of the readiest way to measure a large spire without mounting same? The one I am about to essay is ornamented by gabled lights in several stages, and the angles of the octagon start a new curve upward from the cill of every light. Any useful hint will be appreciated by—Tyro.

[5830.]—**Sketching.**—Am desirous of sketching (for 10 or 12 days) some half-timbered and Queen Anne work about the Midland counties. Would any fellow student advise best district, stating points of interest *en route* or within easy distance of some central place? Would Cheshire be a good field with Chester as head-quarters?—Northumbrian.

[5831.]—**Wire to Improve Sound.**—Perhaps some of your readers can tell me of instances where the straining of wires across a hall or large room has been effective in improving the sound. Any information as to the height from the floor, the size, and distance apart of the wires will be acceptable.—G. G.

[5832.]—**Goethe's Letters on Art.**—Will any reader kindly inform me where Goethe's "Letters on Art" may be found? Are they translated with his other works in the Bohn Library?—C. E. W.

[5833.]—**Architect's Charges.**—I shall be glad if any of your readers would favour me with a reply on the following question—viz., I have prepared preliminary sketches and designs, general drawings, plans, elevations, &c., working details and specification for a new building, have also obtained tenders from several contractors, the lowest amounting to £2,000. The tender has been accepted, and the work has to be proceeded with at once. I may say the amount of the accepted tender is quite satisfactory to my client. I have also made copies of plans for use of corporation. I wish to know what percentage I can legally claim from my client for the work above mentioned (exclusive of personal superintendence of building).—A Subscriber.

[5834.]—**Ball-room Floor.**—Has any architect used indiarubber under a floor for dancing on, and with what success, and how put in? Ball-room is 50ft. by 30ft. wide, joists 12in. by 2½in., with bearing in centre, covered with pitch-pine flooring.—Architect.

[5835.]—**Cast-iron Girders.**—Will any of my fellow-readers kindly give me an easy method of finding the breaking weight of cast-iron girders?—F. J. F.

[5836.]—**Removing Mildew from Engravings.**—I shall be obliged if any reader can tell me by what means I can remove yellow damp marks or mildew from an engraving.—E. W. J.

[5837.]—**Tile Painting.**—Could any one give me information on this subject as to the pigments and other materials required, where they may be obtained, &c., or recommend me any good handbook on the matter?—T. Y.

[5838.]—**Weight of Pipes.**—In p. 282 of Nystrom's "Pocket Book of Mechanics," a rule for finding the weight of pipes is given, thus:—The diameter of the pipe in inches, measured from inside to outside, multiplied by the co-efficient for the metal, will be the weight in pounds per linear foot. The co-efficient for lead is 0·1005, rolled iron 0·0876, cast iron 0·0811, &c., &c. It seems a very simple rule, and yet I can make nothing of it. Will some reader kindly explain it?—A. H.

REPLIES.

[5773.]—**Lime.**—In reply to Walter F. Read, what "W. F. R." says with respect to first grinding stone affording a meagre lime and not hydraulic, unless so ground before burning, is worthy of notice, as it proves what might be imagined, namely, that the heat cannot be equal in a large piece of stone, and that to avoid overburning the outside, the inner portions of stone will be under-burnt, and that where an excess of alumina does not exist, that part only of such being thoroughly burnt will cause the lime to be deficient of hydraulic property, and which might suggest the inquiry as to whether all meagre limestones would not be much better ground before being burnt, and placed, in so doing, in wire trays to draw out at the side, like an ordinary wood-drawer, and to be inclined and in continuous planes inclosed by sides, and having intervening trays containing fuel, likewise to draw out, and the spaces between to be contained by convergent planes of trays, being smallest at the upper end, and there entering the furnace shaft or smoke flue. It would perhaps be expensive at first, but possibly afterwards repay, as the limestone would most probably be much more quickly burnt, and be very superior. I put this as a suggestion, but of course cannot vouch that it would answer. It may be already in use, and I am inclined to think that some such method is in use, but should like to know where. With respect to "W. F. R.'s" question as to where poor lime without any alumina may be found, and in which he refers to my statement that poor limes contain no alumina, to be strict I should say that poor limes may contain no alumina, and that they cannot contain any sufficient quantity of it to render them hydraulic—that is, supposing that a certain percentage of alumina would then render the insoluble silica soluble. Would "W. F. R." kindly send a tabulated account of what analyses he has made, stating when he made them, and where in each case the stone was obtained, and the percentage of each chemical component constituents, and what kind of lime he obtained, and how he tested it, as we shall be glad to be instructed further than at present. With respect to the softening of lime through the absorption of carbonic acid gas, I have not said that any lime will soften through the agency of carbonic acid, but that chalk lime would do so. I may remark to "W. F. R.," who appears to have made lime a speciality, that I have not been able to devote much attention to it, and that my first paper was only intended as the merest outline on the subject, and to be sufficiently dependable for such purpose; but much exactness of expression would have necessitated a longer letter than I thought was necessary. Really pure lime, as soon as exposed, will absorb the water and carbonic acid gas of the atmosphere. It is generally allowed that chalk limes are quite unsuited for exposure to the weather, and that when exposed they will not harden sufficiently. The lime of commerce being carbonate or subcarbonate of lime, the carbonic acid gas is driven off by heat, and unless the silica and alumina be present in combination, and having previously been calcined, the lime will, when exposed, deteriorate, and because of the action of the atmosphere. It has until recently been doubtful whether hydrate of lime will absorb much, if any, oxygen, and in the absence of any proof that it does we may be permitted to assume that it may not. Then nitrogen is exceedingly weak in affinity for substances both elementary and compound, and generally will require circuitous methods to combine it with another substance, and if it would unite with lime we should then have nitrate of lime as result, but I never heard of such; and if with oxygen, then oxide of lime. I have heard of oxide of calcium. We have but two gases in the atmosphere which can deteriorate chalk lime, namely, carbonic acid gas and aqueous vapour. Now it is certain that lime which is not hydraulic more or less will be unsuited for exposure to the damp of the atmosphere, and will therefore be injured by aqueous vapour. If you allow that oxygen does exist in the chalk lime mortar, then, as carbon and oxygen do not readily combine, how can carbon tend to harden the lime? And if you do not allow that oxygen is present, then how does the carbon tend to harden the lime, which gets softer? We have seen the improbability that either nitrogen or oxygen can soften the chalk lime, and we have no proof that aqueous vapour alone is sufficient to deteriorate chalk lime. We may form from chemistry some slight idea whether carbonic acid gas would do so. I will quote from a University text-book on Chemistry:—"Carbonic acid exists largely in nature. It is found in comparatively small quantities in the gaseous state in the atmosphere." "It is in solid combination that carbonic acid is found in the largest quantity, forming as it does nearly $\frac{44}{100}$ of all limestones and marbles, besides occurring in less amount united with other earths and metallic oxides." Carbonic acid (CO_2) = 16 + 6 = 22 = atomic weight. "When carbonic acid is required for experiment it is usual to evolve it by decomposing a carbonate rather than to form it by the combination of its elements. For this purpose place some marble or chalk in a retort and pour on it some dilute hydrochloric acid, and collect the gas over the pneumatic trough. The decomposition is $CaO, CO_2 + HCl = CaCl + HO + CO_2$. The usual test for this gas is lime water. When lime water is mixed with carbonic acid carbonate of lime is formed, which is known by its milky colour. The presence of carbonic acid in the air may be proved by placing a dish containing lime water in a room and leaving it for a few hours. It will gradually turn milky, on account of its slow conversion into carbonate of lime. Carbonic acid is also found in water, and is of great use to plants, since it provides them with the carbon necessary for their growth. It is soluble in water, one part of the acid being absorbed by one part of the water." From the preceding I think we may fairly conclude that it is probable that as chalk lime is deteriorated after being made into mortar by exposure to the atmosphere that neither oxygen nor nitrogen deteriorates it, but carbonic acid, combined with aqueous vapour, and if "W. F. R." does not feel convinced of the probability of what I say, will he say what does tend to decompose chalk lime mortar? Of course we know that a chemical compound if added to is liable to destruction, and if chalk lime mortar be destroyed what atomic weights will be the result; will "W. F. R." kindly state?—Henry Ambrose.

[5787.]—**Strains on Collar Beam Roofs.**—Would "B. S." kindly state how he arrives at the conclusion that "if the collar is above the walls or foot of rafter, then the collar is, as 'S.' says, simply a strut"? Would "B. S." also, for our instruction, say what pressure per foot lineal along wall plate of straight walls 9ft. high, and the thickness he adopts would be sufficient to turn them over and prove that the breaking joint on which with sufficient pressure the upper part of wall would overturn can be determined before hand? And would he also state and show his figures proving what pressure his roof, if it were straight and continuous, would horizontally exert when aided by the wind to overturn his walls, and state what percentage of surplus power he would have left either in excess or otherwise? And if his ratio of height to span were reduced to give a pitch of 30°, and if his walls were raised to three times their height would the collar still be in compression? And, again, if his roof is an oval one on plan, is not his wall plate and also the walls well tied all round the top, so that if any part should be pushed out then another part would be pulled in, and if so, does not this entirely alter the conditions when compared with those under which collars are usually used? And if rafters are to be resisted by the walls, then why not hips, and why do they usually put an angle tie and dragging piece to hold in a hip? And why in cases where they do not use principals nor collars do they dovetail or notch down on to the plate tie-beams? Engineers frequently form small roofs with trusses composed of five triangles in wrought iron, with two short iron struts at right angles to and under the centres of principals, all excepting the principals and struts in each truss being ties made of, perhaps—say, the collar 1¼in. round iron. Can the round iron collar be considered a strut, because if it can I should think it would be likely to bend? Would it be the most economical sectional arrangement of metal for a strut? If we take an example of a wall 14in. and 9 times its thickness in height—namely, 10ft. 6in. above its base, and supposing the mortar adhered so strongly as to prevent any joint above opening, then at 14in. high such a wall would overturn with half its own weight, and at 9 times its thickness with half its weight multiplied by 1-9 = 1-18, and therefore if we were to take a length weighing 18cwt., then 1cwt. might be expected if applied horizontally at the top to overturn the said length of wall, if not tied or hindered at its extremities, and about 2ft. lineal of wall would give 18cwt., and a roof of one-third pitch would give if the span were 9ft. about 5¼ft. super. bearing at ridge a perpendicular pressure, including wind and snow, of about 2½cwt., and this discharged along the rafters will be resolved into horizontal pressure in the ratio of about 4½ to 3, giving about 3¾cwt. pressure against one hundredweight ultimate resisting power in the wall. I should be glad to hear whether if two collars were put in such a way whether they would not be in tension, or if not then how long the walls would be likely to stand. It should be recollected that the ultimate resistance should be at least four times the greatest possible pressure. It appears to me to be an imperative duty not to mislead young beginners into erroneous notions on such important questions as safe roofs. Can "B. S." prove that in the roof I have just named the collar is not in tension?—Henry Ambrose.

[5787.]—**Strains on Collar Beam Roofs.**—I may remind your contributor, Henry Ambrose, that when indicating the mode in which I thought the strains in a common collar beam roof might be investigated, I said nothing about a tie below the collar, nor about a queen-post truss, and I do not think it necessary to defend the language I used. The experiment he describes of solid slopes instead of rafters is too unlike a real roof to be capable of satisfactorily settling the question. I do not deny that his mode of dealing with it may give correct results, for a particular case, but unfortunately that case excludes the most difficult part of the subject. Take the very common one of a lightly timbered span roof, with collars, but no ties at the plate level. In the majority of these it will be found that the plates have been more or less thrust outward, and the rafters have bent under their load. Is not H. A.'s theory incomplete in that it indicates no force (cross strain) tending to bend the rafter? He says he resolves the forces at the plates and apex. I understand when a force is resolved that it is split up into its components. In this case I presume the vertical force of the load on the rafters would be resolved into two components, one acting parallel with the other perpendicular to the direction of the rafter. H. A.'s theory deals with the first of these, but ignores the second—namely, that which produces cross strain. In my view, however, the really important thing is what are the forces acting at the point of attachment of the collar with the rafter, including, of course, this cross strain. It is clear to me that this is the weak point in such roofs as generally constructed, and the object of my original question was to obtain a good method of determining all the forces developed in the roof, especially those acting at this weak point, and of finding the real effect of the collar.—S.

[5803.]—**Proportion in Church Architecture.** I beg to thank "G. H. G." and Henry Ambrose for their valued particulars, and shall be glad if the latter would, when convenient, give some definitions as to chancels, towers, &c., &c., together or separately. I am sure this would greatly help, not only myself, but other fellow students. I hope I am not asking too much or encroaching upon your space.—PERPLEXED STUDENT.

[5811.]—**Store Floors.**—Thanks to Mr. H. Ambrose for his answer to my query. I intended the store for corn in bulk, which is only stowed 4ft. deep, giving, I believe, a weight of 1cwt. 3qrs. to the foot superficial. I calculated my beams, &c., to carry about 2½cwt., including weight of timberwork, but thought the scantlings, when worked out, appeared to be very heavy compared with those of some floors I saw built. In Wightwick's "Hints to Architects," the weight of a floor is said to be a moving load.—SAFETY.

[5813.]—**Rain Water from Nave Roof.**—The only artistic way to convey the water from the nave roof gutters to the ground is to adopt the mediæval method of forming gargoyles to throw the water off upon the roof of aisle. If a pipe is used it is better to bring it down over the aisle roof to the aisle gutter. The method proposed by "R." would obviate the unsatisfactory appearance of a pipe brought over the roof of aisle, and would check the violent rush of water to some extent, but a plain sunk gutter would answer the purpose and avoid the inartistic pipe over the slates. In some churches the pipes are brought down under the slates to the aisle gutter or a trunk is formed under the slates. I do not think the hiding of the conduit at this juncture necessary; certainly it is not desirable. When flying buttresses are uesd, which is not often, the conveyance of the water might be accomplished in at least a more satisfactory manner.—G. H. G.

[5814.]—**Poor Law Board Building.**—Yes; apply at the offices of the Local Government Board.—G.

STAINED GLASS.

ST. MICHAEL'S CHURCH, HEADINGLEY, LEEDS.—The east window in this church has been filled with stained glass, illustrative of some of the principal events in the Passion of our Lord. The subjects chosen for the four chief openings are as follows:—Christ bearing the cross; the Crucifixion; the Resurrection; and Christ meeting Mary after the Resurrection; the Ascension, as the culminating event, being reserved for the three larger tracery lights. The work is executed in the style of the 15th century, and has been designed and painted by Powell Brothers, of Leeds and London, under the superintendence of Mr. C. Fowler, architect, Leeds.

STATUES, MEMORIALS, &c.

OLDHAM.—A mural monument to the memory of the late Rev. R. S. Gooday, M.A., for over thirteen years vicar of St. James' Parish, Oldham, has just been erected in the church in which he was for so many years minister. The tablet is from the design of W. Kenyon Knapp, Esq., architect, Manchester, who has also superintended the work. The sculptor is Mr. Wm. Green, also of Manchester. The mural tablet is composed of richly-coloured and white alabaster and coloured marble. The general design rises from a sill, under which is a carved stringcourse of natural foliage, terminating at each end with corbel angels. From the upper side spring the buttresses and columns, forming jambs to marble panel, on which is placed the inscription. Over the inscription is a double cinquefoil-headed canopy, richly moulded, the label mould being enriched with crockets and finial intersecting the moulded cornice. From the finial of each canopy spring the angle buttresses and columns which form the jambs to the upper niche containing the statue of the "Good Shepherd," which stands upon a carved corbel, composed of vine-leaves and grapes. The lower panel and upper niche are connected together by flying buttresses. Over the upper niche there is a moulded canopy, with carved crockets, and the whole terminating with a finial at apex.

WATER SUPPLY AND SANITARY MATTERS.

CROSBY.—A special meeting of the Great Crosby Local Board was held last evening, the 9th inst., to consider a report prepared by Mr. T. Mellard Reade, the engineer to the board, with reference to reconstructing the mouth of the outlet sewer of the district, and the best way of dealing with the subject generally. The report set forth that in consequence of the inroads of the sea, the original line of iron pipes on the foreshore had become completely detached from the line of sewer. Mr. Reade was of opinion that any new works from the outlet should be capable of being adapted to any further changes that might take place, and he recommended that the sewage should be turned into Thornbeck Pool at a point about sixty-seven yards above the ordinary high-water mark of spring tides, or by preference along another line, which would involve the reconstruction of about 110 yards additional length, and which would show a more direct course. He proposed making permanent outlet works with the view, at a future time, of connecting the new outlet terminating by a sluice in the pits in Mr. Wright's field with it. The estimated cost of the first portion of the work was £1,331, and if it was decided to reconstruct the additional part the extra cost would be £440, in all £1,771. Mr. W. B. Forwood proposed that the engineer be requested to obtain estimates for the reconstruction of the stone outlet as plan, and that the Little Crosby Board be informed of the condition of the outlet and the cost of reconstructing it, and be requested to contribute towards the expense. That the Great Crosby drainage be turned into the new outlet by the use of earthenware pipes from the point indicated in the plan, and that estimates be obtained for the same. After a discussion Mr. Forwood's motion was carried by the casting vote of the chairman.

LANCASTER.—The cofferdam at Abbeystead reservoir works, from whence the town of Lancaster obtains its water, burst the other evening owing to the pressure caused by a heavy rainfall. For some months past a new compensation reservoir has been in course of construction for the purpose of increasing the water area from 30 to 60 acres. The coffer dam was seen to be imperilled on Tuesday week, and at night the workmen, apprehensive of danger, deserted their posts and took refuge in the mission-room at Abbeystead. The dam gave way at 6 next morning, and the materials of all descriptions, the fish pass at the weir, and a wooden footbridge were carried away. By the accident the progress of the work will be much retarded. The loss, which is great, will fall on the contractor, Mr. Hannah, of Middlesborough.

LEGAL INTELLIGENCE.

PEWS IN PARISH CHURCHES.—Dr. Tristram, as Commissary-General of the Diocesan Court of Canterbury, has just decided the cause for some time known as the "Bexley Faculty Case," which has for the last few months created the greatest interest in Kent. Early in the year the vicar of Bexley, the Rev. J. M. Fuller, and the then churchwardens, Mr. J. F. Jackson and Mr. G. Campkin, filed a petition in the Court praying a faculty to repair and reseat the parish church of Bexley, and to build a new south aisle, vestry, and organ chamber, from plans prepared by Mr. Basil Champneys, at an estimated cost of £2,100. It was hoped by the promoters that the result of the enlargement and alterations would be to make about half the church free and unappropriated, a most desirable object, there being 1,500 souls in the curtailed district now left to the old church. In the way stood five large faculty pews, occupying large spaces in the church. The result of the hearing was to some extent a compromise. Mr. Maitland Dashwood, as the owner of Hall Place, an ancient interesting mansion (in which the Black Prince was born), claimed two family pews; Mr. W. C. Pickersgill, as the possessor of Blendon Hall, two more; and Mr. A. W. Bean, as the possessor of Danson Park, one. Dr. Tristram, in giving judgment, said the Court held that Mr. Dashwood had established his title by prescription to the larger pew, but declined then to decide as to the second pew, without calling for further evidence, but counsel held out hope of the matter being settled in a friendly way between the promoters and Mr. Dashwood. Mr. Pickersgill was adjudged not to be entitled to the whole space he now occupied (seats for over 18 persons), but it was decreed that upon the reseating he should be entitled to a pew of reasonable size. Mr. Bean not having produced any faculty deed no decision was given on his claim; but it was intimated that he was ready to come to a friendly arrangement with the vicar and churchwardens.

CHIPS.

The Society of British Artists' present exhibition, at the Suffolk-street galleries, will, we understand, be open every evening from 7 to 10 o'clock, commencing on Monday next, the 21st inst.

The members of the Architectural Sketching Club held an excursion to Waltham Abbey on Saturday last, and, notwithstanding the wet, several sketches were made. The next visit of the sketching club will be to Putney, to sketch the old Queen Anne houses there.

A handsome monument of marble and granite has been erected in the cemetery at Great Yarmouth in memory of the late Mr. C. S. C. Mills, who is buried there. It is surrounded by a screen of wrought ironwork, which is said by the *Norfolk Chronicle* not to be equalled in the Eastern Counties. The design represents roses and lilies in full bloom, with leaves; the standards at the four angles are twined with ivy leaves, and on the west side are two connected wreaths of roses, camellias, and lilies. The whole has been wrought by hand by workmen in the employ of Messrs. Cottam, of Winsley-street, London, who acted under the directions of Messrs. Macdonald, Field, and Co., of London and Aberdeen, by whom the monument was constructed.

The first stone of the Swansea new docks was unofficially laid on Wednesday week, and the work of excavation has been commenced.

Our Office Table.

THE Great Eastern Railway Company are carrying out extensive works, at Ray Island, a peninsula on the river Stour, two miles above Harwich, with a view of providing for a large railway and sea traffic, and in fact, of transferring the Continental Packet Service from Harwich-harbour to Ray Island. A loop-line deviation of railway is to be carried round the headland, communicating with a quay 1,800ft. long; the latter will be built on iron screw piles with concrete between, and will afford to vessels lying at a *minimum* depth of water, at low tide, of 15ft. The low ground at the back of this quay, part of which is at present submerged, will be entirely filled up, forming an open area with sufficient space for miles of sidings, sheds, warehouses, wharves, and other accommodation which the company hope to furnish, not only for their own line of steam-vessels to the Continent, but for Continental steamship companies who may be induced to run to Harwich. Above 500 men are employed on the island, by the contractor, Mr. Ridley, of London, and in addition there are three of Messrs. Dunbar and Ruston's patent "steam navvies"; each of these excavators can remove 1,000 cubic yards of earth a day, and the saving in labour is estimated at 75 per cent. A waterworks have been provided on the island, and the tanks are supplied by a pumping-engine, by Mason, of Ipswich. The undertaking has now been in progress nearly twelve months.

THE additions to the Margate Jetty Extension works, are just upon completion. The original pierhead is hexagonal in form, and is constructed on strong greenheart piles. It consists of an outer promenade, connected by six bridges with an island in the centre, on which has been erected a handsome pavilion. The area of the original hexagonal head was about an acre, to which has now been added 3,800ft. super. of decking, and 1,067ft. super. of landing accommodation—making 4,867 feet superficial, or an additional area of about one ninth of an acre. The new works were undertaken as it was found desirable to have further accommodation for landing from the steamers, which of late years have increased in size. The piles, with the exception of the fender-piles, are of greenheart timber, this particular wood being the best to resist the attacks of the sea-worm. The works have been carried out by the contractors, Messrs. Paramor and Son, of Margate, under the direction of the engineer of the Jetty Extension, Mr. Geo. Gordon Page, M. Inst., C.E.

As a step towards the establishment of a national water-supply museum it has been decided to hold an exhibition at the Alexandra Palace during the next few months. A meeting of the committee for promoting the museum was held on Thursday last, at 4, Broad Sanctuary, Westminster, when, among other resolutions, one accepting the offer of the lessees of the Alexandra Palace of the use of the "Exhibition Court" (200ft. by 100ft.) was passed. The ultimate object is to bring together a collection of plans, diagrams, models, apparatus, &c., which shall illustrate all the considerations that have to be regarded in arranging water supplies. The circular expresses the belief that very few people have any idea of the wide scope of the subjects that have practical bearings on the various aspects of water-supply arrangements. The plan of the exhibition, as given, is arranged in the following sections:—(1) The physics and chemistry of water; (2) rainfall (including tables of periodical averages); (3) catchment basins, with apparatus for studying percolation and evaporation, current metres, &c.; (4) geology and hydrogeology (including well-measuring apparatus); (5) waterworks and filter beds, well sinking and boring apparatus; (6) distribution of water—pipes, taps, and household appliances, waste preventers, &c; (7) water examination—chemical analysis, microscopic examination, and examination of clearness; (8) filtration—cistern, table, and pocket filters; (9) hardness in connection with washing, cooking, brewing, and tea and coffee-making; soaps in connection with washing; and methods for testing and lessening hardness; (10) water in connection with the spread and origination of disease; (11) antiquarian illustrations; (12) statistical tables; (13) pollution and its prevention; (14) literature; (15) artificially aërated waters and cooling appliances. Information respecting the committee and its proposals will be given on application o Mr. A. T. Atchison, M.A., 34, Great George-reet.

The Rev. Bryan King, whose troubles at St. George's in the East twenty years since made his name familiar to most readers, appeals for aid to restore his church at Avebury, near Calne. The church contains work of the Saxon and Norman periods, with considerable additions of the fourteenth and fifteenth centuries, whilst some most interesting wall paintings of the fourteenth century have been lately brought to light. All these historic records will be preserved with the most scrupulous care, in the hope that at some future day the exquisite chancel screen, the windows, and the walls may be restored, as special gifts, to their original grace and beauty. At present the church is in a state of general dilapidation, but a commencement has been made in its repair by the almost entire rebuilding of the chancel and of the east wall of the nave, in accordance with the original proportions, under the directions of Mr. Withers, and this has resulted in the improved appearance of the building.

The present session of the St. Paul's Ecclesiological Society closes on Saturday, the 26th inst., when a visit will be paid to the Abbey Church of Waltham Holy Cross. The society have been fortunate enough to induce Mr. W. Burges to accompany them, and under his guidance the members cannot fail to spend a pleasant and instructive afternoon. The vicar, the Rev. J. Francis, who is a member of the society, has offered every facility that may add interest to the visit. The St. Paul's Ecclesiological Society is a young association, but if it continues the work it has begun well this year, a prosperous and useful future is before it. The next session will commence early in November, of which due notice will be given. Meanwhile all communications should be addressed to the courteous and energetic secretary, Mr. R. Howard Wall, 18, Little Britain, E.C.

The annual congress of the Archæological Institute will be held this year at Taunton, and will occupy the entire week from Tuesday, the 5th, to Tuesday, the 12th of August, inclusive. After the presidential address on Tuesday, the members of the congress will visit Taunton Castle, St. Mary Magdalen's Church, and other objects of interest in the town, and will be entertained at lunch by the Mayor and Corporation. The next day (Wednesday) will be devoted to an excursion by railway to Cleeve Abbey and Dunster Castle, followed in the evening by a conversazione in the Castle-hall at Taunton. The morning of Thursday being the annual meeting of the Institute, will be devoted to business, and in the afternoon there will be a carriage excursion to Staple FitzPaine and Castle Neroche. Friday will be spent in visits to Bridgewater, Cannington, and Fairfield, and also to Quantoxhead and St. Audrie's; and in the evening the Mayor of Taunton will entertain the members and visitors at a conversazione. Saturday will be devoted to Michelney Abbey, Montacute-house, Barrington-court, Ilminster, &c.; and Sunday will be a *dies non*, but there will be a special service in the church of St. Mary Magdalen. Monday will form, perhaps, the most attractive portion of the programme, as the Institute will make an excursion on that day by railway to Glastonbury Abbey and to Wells, where, after inspecting the cathedral, close, deanery, &c., they will be hospitably received by the Bishop at the Palace. The concluding day, Tuesday, will be occupied by sundry sectional meetings in the morning, and excursions by carriages to Norton Fitzwarren, Bishop's Lydeard, Cothelstone, &c.; and the general concluding meeting will be held in the evening.

The managers of the Metropolitan Asylums Board paid their first annual visit on Saturday last to a new and interesting work which they have commenced, in the endeavour to utilise a hitherto waste force, by the education and industrial training of pauper imbecile children. A temporary asylum was established under Sir E. H. Currie's committee, and there the pauper imbecile children drawn from workhouses and asylums were classified, taught, and trained under Miss Stephens. The asylum at Darenth, built on the hill overlooking the valleys of the Thames and Darenth, was completed last year from designs by Messrs. A. and C. Harston, and accommodates 700 children, and on Saturday 420 of them were seen. While all admired the general construction of the building, the system of open corridors—insisted upon, it was stated, by the Local Government Board because an inspector had seen it in Berlin—was generally regarded as altogether unsuitable to a building on a Kentish hill. The asylumn is a working institution in all respects, and is independent of sewerage, water, and gas companies, for it utilises the sewage, makes its own gas, pumps its own water, and grows part of its own food. It has good farm buildings, which will not only meet the wants of the present asylum, but the wants of the new asylum, being erected for 1,200 imbeciles. The building was illustrated and fully described in the Building News of Oct. 29 and Nov. 5, 1875.

CHIPS.

The West Bromwich Improvement Commissioners have appointed Mr. John T. Eayrs, borough engineer and surveyor, Newcastle-under-Lyme, as their surveyor, out of 141 applications.

The picturesque church of St. Bride, Douglas, Lanarkshire, is being carefully restored under the superintendence of Mr. R. Anderson, A.R.S.A., of Edinburgh.

Duncombe House, Yorkshire, the seat of the Earl of Faversham, recently destroyed by fire, is to be rebuilt from plans to be prepared by Mr. Alfred Waterhouse, A.R.A.

The Hull Corporation have purchased the Milldam Springs for £1,250, and are in consultation with Mr. Batemau, C.E., as to procuring a supply of water from the West-beck, 18 miles from their works at Stoneferry.

On Thursday night the students of the Derby School of Art presented Mr. J. T. Cook, the second master, with a timepiece as an acknowledgment of services rendered during the past seven years.

A new church of St. Mary was opened at Shandon last week. The architect is Mr. W. Hill, of Cork.

Her Majesty's Commissioners for Prisons have accepted the tender of Messrs. Close, of Lincoln, for the erection of 80 additional cells at the prison in that city.

It was recently decided to pull down and rebuild Holy Trinity Church, Burton-on-Trent, and Mr. H. Allsopp, M.P., has promised £10,000 towards the cost.

Mr. Arnold Taylor, C.E., held an inquiry at Duffield on behalf of the Local Government Board with reference to the proposed construction of a special drainage district. It is intended to dispose of the sewage of the district, having a population of 1,200, by irrigation on ten acres of land. The estimated cost is about £3,000.

New children's quarters are being added to the Union Workhouse, Lincoln, to which other alterations are being made. The guardians have accepted the tenders of Messrs. H. S. and W. Close, of that city, at £6,379 for alterations, and £3,944 10s., making a total of £10,323 10s. for the execution of the entire work

Mr. R. Anderson, who read an important paper on the same subject at the last meeting of the British Association, has in the press and nearly ready for publication, an elaborate treatise on "Lightning Conductors, and their History, Nature, and Mode of Application."

The joiners' lock-out in Leeds is at an end, the dispute having been amicably arranged.

The hall erected at Chesterfield as a memorial to George Stephenson, the pioneer of the railway system, was opened on Monday. Messrs. Smith and Woodhouse, of Manchester, are the architects.

The parish church of Newton-on-Trent was reopened on Monday after partial restoration.

The Talbot Hotel at Bradford, which for more than 200 years has been a well-known hostelry in the town, was recently reopened after rebuilding. The architects are Messrs. Andrews and Pepper, and the builders Messrs. Williamson and Gaunt, of Bradford. Several stained-glass windows are inserted in the principal rooms, the subjects being of a jovial character, in keeping with the establishment; these have been supplied by Messrs. Powell and Co., of Leeds.

The Furness Railway Company has commenced the erection of cattle-lairs and slaughter-houses at the new dock works at Barrow. The scheme includes lairs to accommodate 8,000 head of cattle, and the necessary slaughter-houses, which are to be fitted with Meiklejohn's patent apparatus.

A vestry meeting was held at Wesley, in the Tendring Hundred, East Essex, on the 26th ult., to receive report and plans as to the parish church, prepared by Mr. E. C. Robins, of John-street, Adelphi, W.C. Mr. Robins stated his opinion, that the tower is the only part of the present church, which it is desirable or even possible to retain. He estimated the cost of building a new church on to the existing tower at £2,500; or, the erection of a new church on another site,—including the making of the tower suitable for funerals, by adding to it a small cemetery chapel—at £3,500. Ultimately, the former plan of rebuilding on the present site was unanimously adopted, and a committee was formed to carry out the scheme under Mr. Robins.

The memorial stone of a new Baptist chapel was laid at Peterchurch on Monday week. The style of the new building is Gothic. The chapel will be 41ft. long by 27ft. 9in. wide, with a vestry at the north end, 12ft. by 27ft.

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N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION.

THE BUILDING NEWS.

LONDON, FRIDAY, JULY 25, 1879.

THE DRAINAGE OF THE THAMES VALLEY.

IT seems likely that sewerage matters in the Lower Thames Valley will again come to a deadlock, and the decision of the Master of the Rolls on Friday last places the members of the Sewerage Board of the united district in a very awkward predicament. It will be remembered that the towns situated westward of London, which have hitherto discharged their sewage into the Thames and its tributaries, have, for the last few years been exposed to serious difficulties in their efforts to dispose of their polluted waters; being pressed on the one hand by the Conservators of the river Thames to abate the nuisance they were causing, and finding, on the other, the utmost reluctance on the part of residents and landowners to permit of the establishment of sewage farms or sewage works of any kind. After repeated failures on the part of individual towns to obtain Government sanction to plans of sewage disposal, and after an inquiry by Colonel Ponsonby Cox, on behalf of the Local Government Board, into the whole question of the drainage of the Thames Valley, the towns chiefly interested in the matter constituted themselves in 1877, by means of a provisional order, a united district, called the Lower Thames Valley Main Sewerage District, for the purpose of making a main sewer for the use of the constituent district. This order was subsequently confirmed by Act of Parliament, or rather the provisional order in due course obtained Parliamentary sanction, and the Board proceeded to invite plans from engineers for laying out the main drainage works, and for dealing with the sewage of the Thames Valley. Various schemes were sent in, some of the more costly of which involved the construction of main sewers to discharge the sewage untreated into the sea or into the estuary of the Thames. Some of the engineers proposed sewage farming on an extensive scale, others were in favour of precipitation, and the plan of Messrs. Haywood and Birch was ultimately adopted. These gentlemen collected by means of a series of main outfalls the whole of the sewage to one spot in the neighbourhood of Hampton Court, where it was proposed to raise it on to land situated between the Mole and the Ember, and to create a sewage farm on a very extensive scale. After availing themselves in the first instance of the course provided by Parliament to obtain the relief they needed, the next act of the joint board seems to have been less well advised. They promoted a Bill in Parliament to carry out the scheme which Messrs. Haywood and Birch had propounded, and they scheduled the land required for the purposes of their farm. It is scarcely necessary that we should point out that the formation of the board having been effected by means of a provisional order, the legitimate course to have adopted would have been to have applied to the Local Government Board to sanction the advance, on the security of the rates, of the sum required to carry out their scheme. An inquiry before one of the inspectors of the Local Government Board would have then taken place, and if approved by him a provisional order would have doubtless been obtained, and in due course the scheme would have been sanctioned by Parliament. The promotion of the Bill was so ill-advised that it enabled the opponents of the scheme to say that the members of the united board had passed over and disregarded the machinery provided by Parliament for carrying out the object they had in view. When the Bill came forward in the House of Commons it appears to have encountered an amount of opposition for which its promoters were little prepared, and it was thrown out on the second reading by a large majority. Among the chief arguments against it appears to have been the fact above stated, though there were evidences that still stronger objections, to which we need not now refer, were in the background. Anyhow, the Bill failed, and, after the expenditure of a large sum of money, the Board seemed to be as far off the object for which they were constituted as ever. Their next effort is on the face of it open to grave objections, for we learn that they have resolved now to ask the sanction of the Local Government Board to the precise scheme which Parliament rejected. Upon its becoming known that they had decided upon this course, a question was at once asked in the House of Commons, "Whether, in defiance of the vote of this House, the members of the Thames Valley Board had asked the sanction of a Government department to a scheme which Parliament had rejected?" We have not before us the precise wording of the motion, but it was somewhat in the above terms. The reply was that in their present course they were taking the proper steps to have their plan properly inquired into, and that should they obtain a provisional order opportunities would arise for its discussion when it came before Parliament to be confirmed. There the matter seemed for the time to have dropped, until it was recently stated in the Press that an action had been commenced in the Court of Chancery to restrain the united board from spending the money of the ratepayers in other objects than those for which they were constituted, and without the sanction of the Local Government Board. This case was, in fact, tried in the Rolls Court on Friday last, and the Attorney-General, on the information of one of the ratepayers of the united district, was the plaintiff. The decision of the Master of the Rolls was most clearly set forth, and is in the following terms:—"He was of opinion that it was an established law that where funds were intrusted by Parliament to a public body for a definite purpose, the Attorney-General was entitled to restrain that body from diverting these funds to any other purpose. It was also established that where such definite purpose was the execution of any particular work, as drainage, as in this particular case, the public body, not being a trading company, was not entitled to use the funds intrusted to them for another purpose which was only auxiliary or incidental to the specific purpose. On a consideration of the Acts of Parliament bearing on the case, he came to the conclusion that the defendants had no right to apply to Parliament without the sanction of the Local Government Board, and that what they had done was illegal. There must, therefore, be an injunction to restrain them from applying their common fund, or obtaining any other fund, for the purpose of promoting the Bill in question, or paying any expenses incurred in relation thereto." The chairman of the united board, Mr. Nelson, the City solicitor, must, we think, be placed in a very unpleasant position by this decision, as it is stated that the Parliamentary expenses were considerable, and they must now be provided out of the pockets of the members of the board. It is scarcely likely, either, that the members will be persuaded to retain their position at the board, and another period of inactivity will supervene. In the interests of the ratepayers, and of every one concerned in the conduct of this difficult business, we think special attention should now be drawn to the report of Colonel Cox upon this subject. It is the more necessary that this report should be carefully considered now that it has been found advisable to have a tardy recourse to the Local Government Board. When we place the recommendation of Colonel Cox side by side with the regulations of the Thames Conservancy Board, and the standard of purity they prepared in 1870 for the effluent water discharged into the Thames below the intakes of the metropolitan water companies, say, below Teddington Lock, we cannot fail to be impressed with the wisdom of the views of Colonel Cox (which may be assumed to represent the views of the Local Government Board) respecting the process to be employed for sewage purification. Looking to the great difficulties in the way of obtaining land in the Thames Valley for irrigation purposes, and to the many obstacles which exist against sewage farming, Colonel Cox boldly advocates precipitation for the sewage of this district.

Messrs. Haywood and Birch's scheme, if we understand it aright, consists not only in broad irrigation, but in irrigation with raw sewage. They advocate the acquirement of 1,200 acres of land, and propose to pour over this the sewage of 150,000 persons wholly undefecated and untreated all the year round.

Now the standard of the river Thames Conservators is one infinitely more lenient than that of the Rivers Pollution Commissioners, and it is moreover one which, as Colonel Cox truly says, can be reached by an efficient system of precipitation, or, at any rate, by such a system, supplemented with intermittent filtration over a comparatively small area of land.

Instead of 1,200 acres, 100 acres would be ample for such a system properly applied, and in lieu of an opposition from a powerful and compact body of residents, the scheme might have to encounter only the feeble resistance of a few outlying farmers, who would make a sorry show of their purely sentimental objections to a well-conducted precipitation process. It would appear from the recent legal proceedings that the united board has failed in securing the unanimous adhesion of the neighbourhood to the steps it has so unadvisedly taken, and now that it has been found necessary to seek the help and advice of the Local Government Board, an excellent opportunity is afforded to it to reconsider its plans. We have indicated how this might be done, and shown that the plan to which Parliamentary sanction was refused was an extravagant and an unnecessary one. We have shown also that the apparent direction of the views of the Local Government is towards a precipitation system, and that this system, which could be conducted without nuisance upon a small area of land, is one infinitely better suited to a residential neighbourhood than a sewage farm, however well conducted. We have shown, lastly, that the conservators are quite willing to admit into the Thames below Teddington such an effluent as a well-managed precipitation process would secure, and we feel that a carefully considered scheme of this kind is the only one likely to meet with general approval.

MERCANTILE ARCHITECTURE.

IT is interesting to remark how recent developments of architectural taste have affected buildings intended to serve mercantile requirements. Contrasting vividly with the dull, inert, and apathetic style in which most of our City streets are built, exists an evident desire to indulge in a more vigorous and less gloomy mode of building. Indeed, the philosophy of architectural taste points to a method of "natural selection" in this as in other matters. From a dull and wearisome Baker-street style of Classic, it was only natural that we should turn our attention to Mediæval of a rather picturesque mood, and, after having our "fill" of Gothicesque in its several aspects, come back again to the Vernacular brick style, which we all denounced as intensely prosaic and uninteresting a little while ago. Change is the one great element in this selection, and we may almost already foretell what the next fashion will be like. In the City stock brick, stone, and compo have long made up the triumvirate, and Classic of the most uncompromising type has been in the ascendant. This *régime* is at last being supplanted, and we have in Fleet-street two or three new buildings in which the turn of style is decidedly in favour of a species of Renaissance or Elizabethan. On the north side there are already two new buildings having unmistakable features of this character. One we have already described. A more important structure is now nearly completed in the same style for Anderton's Hotel. Its front of red brick and stone is very lofty, the windows are made conspicuous features, and the façade is divided into two distinctly treated parts. The main portion is gabled with ornamental ramps and finials; the latter adjuncts are very flimsy and tawdry additions. The upper stories are supported upon a straight lintel with curved springings. The principal features in the façade are the two-light windows of stone, which have straight moulded lintels with segmental heads, on the second floor, the tympana being enriched with carving. The ends of these heads abut rather abruptly against the projecting red brick piers, which are carried up on both sides. On the upper floors the windows have also straight moulded heads of stone. The "oversailing" work in red brick in the upper stories springs in a rather clumsy manner from stone corbels between the openings, and a little more breadth is wanted. Panels of cut brick relief adorn the interfenestral spaces of the front. The design is generally effective in its masses of red-brick and stone, notwithstanding the detail is crowded and inelegant in parts. The central strip of front above the arched entrance to the hotel is designed in quite another key: there is no apparent connection between them. The stone bay windows jar with those in the flatly treated part and there is an evident want of unity and rhythm. The bay windows are carried up with small angle shafts of stone and transoms; from these caps spring with moulded heads, the effect of which is rather feeble and tame. The arched entrance is constructed externally of polished granite, a bold roll being formed on the inner edge. The bay or oriel is corbelled and springs from the keystone, and the carving of this part and the spandrels are somewhat finical and wanting in vigour. A balustrade with inverted balusters separates the ground story from the upper part. The brickwork appears to be executed with considerable care. We understand Messrs. Ford and Hesketh are the architects. How far this style will supplant the plain brick fronts of Fleet-street will depend on the moderate use of ornamentation, for nothing induces so strong an aversion to any style as the insensate employment of trivialities.

In Ludgate-hill architectural improvement promises to transform one of the most congested arteries of the City into a thoroughfare worthy of its central position. This improvement has commenced on the South side, by the setting back of the old line of frontage to a distance of at least 15ft. The narrow passage-way which led into Pilgrim-street has been rebuilt, and the houses abutting upon each side of it have been set back to the new line of the proposed plan. The two corner buildings for Mr. Smith, now being completed by Messrs. Tarrant, builders, of New Kent-road, are faced with stone, and form two neat fronts. The style is Classic, and the composition is a series of stories supported by pilasters, divided from each other by entablatures—a kind of treatment that of late years has been largely adopted in London. In such limited frontages any amount of wall space is literally impossible if light is to be obtained, and hence the wall is reduced to interfenestral piers—a species of composition which in the hands of some architects can be made vigorous and striking. In the buildings we refer to, iron joists and concrete have been used in the floors, and the back and return elevations are faced with white glazed bricks. Mr. May is the architect, we believe. A little higher up, in Ludgate-square, the office of the Capital and Counties Bank presents a very similar treatment in the elevation, a building we have already described; adjoining to which Messrs. Pritchard Bros., builders, are engaged upon a large building of extensive frontage for Samuel Brothers, intended to be let as shops and offices. It is not in a sufficiently advanced state to enable us to pass a decided opinion on its merits architecturally, though from the portion of the façade already erected, we are inclined to think it will compare favourably with the buildings around it. The architects, Messrs. Joseph and Pearson, of Finsbury-pavement, have selected a style between the Renaissance and the purer forms of the Greco-Italian, characterised by some elegance in the detail. The front, particularly quiet, is of stone ashlar, and relief is obtained by fluted pilasters and shallow horizontal members, except the entresol story, which is crowned by a prominent cornice of considerable projection enriched by dentils and supported by carved consoles. The fenestration is emphasied by square balusters, and the heads of windows have consoles and cornices. The front follows a gentle curve which will unite the wider part of the thoroughfare with Cannon-street. When the present block from St. Martin's-court to St. Paul's is set back to this line, the south-west tower of the Cathedral will be wholly exposed to view, though it is now only partially so. The floors of these buildings are constructed of iron joists and concrete. A bold archway of granite forms the entrance to the square at the back, still in a very unfinished condition, though we find the land is advertised to be let on leases. Ludgate-hill is not at present enriched by any good architecture; the few recent attempts have little to commend them, except an inordinate effort to obtain as much external effect as possible by carving and all sorts of strained expedients. The stilted style which seems to meet the prevailing taste would appear insufferable if the fronts were anything more than mere strips. This affectation in style has already spoilt nearly all our main thoroughfares.

Several large blocks of buildings are in progress in Cheapside. One seven-storied block, for Messrs. Caldecott, Sons, and Co., is nearly finished. It has a stone façade, consisting of rusticated piers continued through all the stories, with recessed horizontal entablatures between them, in what we may call the pier and trabeate style; the windows are of three lights, and single in the centre, the openings being separated by small iron pillars. There is an American cast about the front, and the art of commercial façade-making can scarcely be carried much further. The design is certainly suggestive of what may be done to combine the mercantile elements of city building with architecture; in other words, to mask a huge warehouse by a façade of some pretensions. There is not an arch to be seen in the whole front, though it does not lose anything by the omission, for it must be confessed, the craze for arcuation has been carried to an enervating extreme of late years, and has tended to degenerate into monotony and languor. It is impossible to produce a vigorous or antithetic style by the use of this expedient. We do not undervalue the arch as an element of architectural effect, but, like all decorative devices, it may become wearisome and monotonous. We have only to go through Queen Victoria-street, or some other new City thoroughfare, to see how it has been pressed into service on every possible occasion. Both Gothicists and Italianists have used this feature indiscriminately, until their works have become enfeebled by redundancy. In the Poultry, and near it, may be seen several buildings with nothing but rows of circular and pointed windows, the effect of which is crowded and diffuse. Another feature which strikes us in the new façade we have mentioned is the employment of shallow cornices and projections. Messrs. Caldecott's premises have a flat treatment in the upper portion. In crowded City streets we cannot find fault with this principle. There is an apparent weakness, however, in the upper members—we may call it a pleonasm—in the double mouldings over the pilasters, which have the effect of double capitals. The trusses over them in pairs are also feeble in appearance. Close to this building a large gap is being filled up with shops and offices, by Mr. Laurence, builder. We cannot judge at present of the architectural elevation, though we believe the style will be somewhat similar. Messrs. Collard and Co. are one of the large firms having offices here. We believe these buildings are being erected from the designs of Messrs. Ford and Hesketh, architects. Another large block of stone-fronted buildings, designed by Messrs. Wimble, arrest attention. The architecture is also in this instance a mass of superimposed stories with pilasters and cornices, thoroughly business-like in expression, and devoid of any exaggerated features, except in the attenuated terminals over the pilasters. The horizontal members between the stories are relieved by panels. In this crowded part stone façades possess the advantage of reflecting the light, at least for a short time after their erection, till they reach the dingy and sombre condition of other stone buildings, which are infinitely blacker than red brick when begrimed with soot. These recent buildings at all events steer clear of some vagaries that have scarcely died away. In materials they do not affect either the "brick and marble," or the "streaky bacon" style. Red-brick and stone, either alone or in combination, appear to be the ruling method in the use of materials. As to the style, it appears to us that the attempt is to depart even more determinedly from the vigorous or muscular Gothic on the one hand, and the ornate Classicism of the last Revival. One element is essentially absent; we mean the Venetian and more florid phases of those styles in which we have been accustomed to work. Even our Queen Anne revivalists are giving us the severer forms of the brick-style they affect to practise in; and it seems certain that for commercial purposes, the trabeated form of Classic has a future in store for it.

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THE ENGLISH MINSTERS.*

WE are glad to welcome the issue, in a complete form, of Mr. Walcott's notes on the English minsters. These volumes are published "as an epitome of the collections of years, not as a mere analysis or compilation," and the author states the patent fact that he has "concentrated upon them original research and independent study among new and manuscript sources of information, without which no historic work can be thorough or lasting." It is a pity that the cost necessitated some amount of curtailment. A glossary and index would have greatly increased the value of the work. In some places, too, special references to authorities seem needful, as, for instance, where we are told, at page 32, that Chichester never had the Missal of Sarum laid upon its high altar till the 15th century. There is, however, a very full list of books and references arranged for each minster in alphabetical order at the beginning of the first volume. Much of the matter contained in the volumes has already appeared in our columns, and nearly all the illustrations have. The first volume is divided into four parts. The first treats of the architecture, its styles, symbolism, form, arrangement, and technical terms. The word style is used in two senses: 1st, as distinguishing the older oblong Basilican form of churches from the cruciform (Norman). 2ndly, in its usual meaning of different sorts of architecture. Though in pre-Norman times wood was much used for church buildings, still there were many noble exceptions. "Masons from Rome built a stone-vaulted church at Ripon in 674, for St. Wilfrid," rivalling the "marvel" at Hexham, said to have been the finest church then on this side of the Alps, so that in the eyes of strangers coming from Italy it seemed to vie with the splendid monuments of their own cities, and we actually have a few examples, as those of Dover Castle, Sompting, and Barnac, to give us a notion of what the larger and finer buildings might have looked like.

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*Church Work and Life in English Minsters. By Mackenzie E. C. Wallcott, B.D., F.S.A. London: Chatto and Windus. 1879.

Mr. Walcott gives a first place in the formation and growth of Christian architecture to the symbolism with which the minds of Mediæval thinkers were imbued, and no doubt to a large extent this is a correct view. But it is absolutely certain that much that has been written by Durandus and others upon this subject was merely fancy of their own adapted to what they saw. Thus we altogether doubt that there were anything but structural reasons, added to convenience and aptitude, that determined the beautiful polygonal shape of a large number of the chapter-houses. Once, as was the case at Westminster, imagine a circular chapter-house, and in the 13th and 14th centuries the polygonal form was sure to prevail, and so we have no doubt that the fact of this particular form being used for all the secular chapter-houses except Exeter is simply due to the fact that they were all built whilst that type was in fashion, and that it had nothing to do with any special uses or practices of secular foundations. Why! the finest if not the earliest, the house in fact that set the fashion, was at Westminster, a conventual church. We hold therefore the following description to be simply imaginary:—"The ribs, with arches like the bright curves of a fountain branching from a central pillar and converging upon its capital, represented the relations of the cathedral to the diocese, with a body of clergy connected with it through their prebends and sitting as a circle of assessors about the bishop, the capitulum with their caput." This is actually allowed at page 54 with respect to Westminster, when we read "the fact that the chapter-house built by Edward the Confessor was circular" explains why the "incomparable house" which succeeded it was polygonal. All was not seraphic in the middle ages, any more than in this or any other. If we wish to get a fair view of the causes that contributed to the extraordinary architectural creation of those days we must not shut our eyes to many other helping causes, besides the enthusiastic religiousness of many of the workers. Ambition and great wealth were as influential in this (as in the other kindred case of the perfection of Greek art in the time of Pericles) as any other matter. Then the comic and satirical, and very possibly the political element which pervade much of the detail contributed their share. The carver of the little Devil in the choir of Lincoln can hardly have intended to portray a very dreadful or formidable being. A very full description is given of the ground-plan of a chancel, and an excellent list of technical terms. Part II. treats of the domestic life of seculars and conventuals, in which a great amount of interesting details will be found. "The fare was simple and wholesome. Still, on occasions, and in particular minsters, the living was of a more sumptuous kind." Gerald du Barri, returning in an ungracious mood from a voyage to Flanders, declaims at the innovated fare on Trinity Sunday at Canterbury Hall. There were seventeen courses of made dishes of all kinds of fish, highly peppered omelettes, salted meats, rich sauces, and well-seasoned salads, with all kinds of wine perfumed, stum, cider, mead, but no Kentish ale, the want of which irritated him as much as did the distracting signs made with lithe fingers and arms, and very audible whistling, to which, from the prior to the servants, from the man eating his ordinary commons and his brother enjoying an extra dish from the high table, the monks had recourse—it had been better, he thought, to allow a moderate use of speech. And again, "Beef, mutton, pork, sucking-pig, poultry, game, sugar, rice, currants, raisins, dates, almonds, spices, pastry, cakes, and all kinds of bread, wine, ale, and beer, were served on great days at Ely, besides the special capon feast, and the banquet on wild boar on All Saints' Day." We call special attention to the very clear and well-explained plans, which give at a glance a better and more intelligible idea of the arrangement of the cathedrals and their surroundings than could be got from any verbal description. Most of these have from time to time appeared in our pages. Part III. treats of cathedral foundations, secular and conventual, the former after the Reformation, remaining chiefly unaltered, were called cathedrals of the old foundation, as the latter were of the new foundation, after the conventual foundations had been dissolved. In section 9 we have a good description of the various ways in which funds were provided to build the cathedrals. The munificence of kings was sometimes taken undue advantage of. King William, for example, in 1086 granted to Bishop Walkelyn as much wood as he could carry in four days and nights out of a royal forest. The bishop assembled an army of carpenters and axemen, who hewed down every tree in it. At page 52 we are told that in 830 the Welsh tributaries paid 200lb. weight in gold, and 300lb. weight in silver, no doubt from their own mines. In Part IV. we have a handbook of all the cathedrals in alphabetical order—first, those of the old foundation; and secondly, those of the new. Each description is divided into regular sections:—1. A general account of the building and its belongings. 2. A list of the principal monuments. 3. Any special objects of interest, such as books, plate, documents, armour, or the like. 4. Celebrated men connected with the establishment. 5. The dimensions. 6. A chronological account of the buildings and, when known, of the architects of the various parts of each cathedral. The three west doorways at Lincoln are of the 12th century, though the sculptures inserted above may be of the 11th, or possibly earlier. Some of the figures at Wells are dated with Arabic numerals of the 13th century, the earliest instance of their occurrence in English architecture.

The second volume opens with an historical account of the original development of the English monasteries, giving a geographical description of their distribution and choice of sites. This is accompanied by an exhaustive map of England, containing the names of all English minsters in 1530. Without this map some objection might have been taken to the alphabetical arrangement of the Monasticon. Then come the different rules and principal orders. Part VI. treats of the external relations of monasteries to the bishop, to parish churches, to the diocesan cathedral, to the people, to literature and education, to the collegiate system, to national taste, thought, and temporal advantage, ending with an account of the Dissolution and its consequences. Perhaps one of the most valuable parts of the book is Part VII., which contains a very clear and comprehensive list of all religious houses. This is arranged alphabetically, and is entitled "The English Students' Monasticon." The dedication of each house is given—(2) its order; (3) its geographical position; (4) its net income at the dissolution; (5) its founder. The main details too "have been enlivened with occasional architectural observations pointing out features worthy of special note, historic incidents, customs, anecdotes illustrative of the times, or even a legend throwing light upon popular sentiment." We can fully recommend this work as containing a vast amount of valuable and trustworthy information, likely to stimulate and assist the student in making further and original research for himself. In a future edition we hope to see a good index, which will greatly increase the value of the book.

NOMENCLATURE AND CLASSIFICATION OF MASONRY.*

By Professor L. M. Haupt, C.E.

A CAREFUL analysis of a large number of masonry specifications has revealed the fact that serious discrepancies exist in the use and meanings of the terms employed to designate the several classes and grades of work, giving rise to misunderstanding between the contracting parties. It is the object of this paper to attempt the removal of these ambiguities by comparing carefully the numerous authorities available, and stating the conclusions obtained in such form as may be readily referred to.

In the preparation and manipulation of stones for building purposes three classes of artisans are employed, viz., the *quarryman*, the *stone-cutter*, and the *mason*. It is the duty of the first to detach the stone from its natural or quarry bed, in a rough state, constituting *rubble;* of the second, to reduce the mass to prescribed dimensions with a specified finish, constituting *cut* or *dressed stone;* and of the third to lay the stone with its proper bed and bond in the structure, constituting *masonry*. Hence arise two general classes of masonry—one based upon the preparation of the individual stones, or *the finish*, and the other upon the method of laying, or *the bond*. The first of the above classes naturally resolves itself into the subdivisions of CUT OR DRESSED and UNCUT OR ROUGH stones. The second may also be subdivided into masonry in which the horizontal joints are *continuous* throughout the structure, or REGULAR COURSED; and that in which they are *not continuous*, but broken in offsets, constituting IRREGULAR-COURSED or RANDOM MASONRY.

In designating masonry, therefore, it is seen that to give a clear idea of the kind intended not only the *bond* but the *finish* should be distinctly specified, and care should be taken that there be no ambiguity in regard to the ordinary meanings of the terms used.

The terms ashlar and rubble do not appear to be clearly understood, and even the authorities are not in perfect accord on this subject. In a paper read before the American Society of Civil Engineers, November 7th, 1877, by Messrs. Croes, Merrill, and Van Winkle, ashlar masonry is defined to be "Equivalent to cut-stone masonry. . . . As a rule, the courses are continuous, but sometimes they are broken by the introduction of smaller stones of the same kind, and it is then called *broken ashlar*. . . . From its derivation, ashlar apparently means large, square blocks, but practice seems to have made it synonymous with 'cut-stone,' and this secondary meaning has been retained for convenience."

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* Paper read before the Engineers' Club of Philadelphia.

And the same authorities define "cut-stone" to be those which are "squared and have smoothly-dressed beds and joints." Another authority defines ashlar to be composed of "stones dressed and pitched well and properly so that the *face* of each be a polygon of straight sides not to exceed *six* in number." This is called *broken* ashlar; but if ashlar be *squared* stone, as above defined, this class must be excluded; and since it is more than rubble, having the *joints dressed*, it must belong to the genera of "cut-stone"; yet according to the definition given by the committee of the American Society of Civil Engineers the joints should be at right angles or squared, which they are not, hence it is desirable to make a distinction between ashlar and "cut-stone" by omitting the word *squared* from the definition of the latter, and calling the work just described *dressed rubble*. By so doing it is excluded from the species ashlar, yet included in the genera "cut-stone."

It would appear then that definitions based on the relative position and kind of joints would preserve the distinction between the two grand divisions of ashlar and rubble. So long as the stones are "squared," that is, having beds and vertical joints at right angles to each other, the masonry built of them is *ashlar*, whether the courses be continuous or not. If continuous and of equal height it is "*regular ashlar*," if discontinuous it is "*broken-range*," "*irregular*," or "*random ashlar*." (These three terms are practically synonymous.) If continuous but of unequal height it is simply *range work or block-in-course*.

If the stones are *not* "squared" but have hewn joints perpendicular to the face, and making any angles with each other, it is "*dressed rubble*," and if unhewn or in a natural state, simply "*rubble*." The face of "dressed rubble" may be hewn, pitched, or rough.

Ashlar.

Gwilt defines ashlar as "common or freestone, as brought from the quarry—also the facing given to square stones on the front of a building." Webster quotes from Gwilt.

Rankin says ashlar or hewn stone consists of blocks cut to regular figures, generally rectangular, and built in courses of a uniform depth, seldom less than one foot.

Burn, in *Working Drawings and Designs*, defines it as a facing of hewn and dressed stone given to walls, the back of which is rubble.

Knight, *American Mechanical Dictionary*, makes two classes: (*a*) *Rough*, a block of freestone as brought from the quarry. (*b*) *Smooth*, a block dressed ready for use.

Parker, in his *Glossary of Architecture*, is most explicit, and says it is hewn or squared stone, used in building, as distinguished from that which is unhewn or rough as it comes from the quarry; it is called by different names at the present day, according to the way in which it is worked, and is used for the facings of walls, and set in *regular courses as distinguished from rubble*. . . . He adds: "clene hewen" or finely-worked ashlar is frequently specified in ancient contracts for building, in contradistinction to that which is roughly worked, and quotes from old MSS. (1465-6) as follows:—"Here folwth the maner and certeyne rule of meatynge of *ashelers*. First it is to understande that every *ashelere* is xij ynche thykke and xviij ynche longe, wiche multiplied togeder make ij. c. xvj. ynches; and so every *asheler* of what lengthe or brede that he be of, conteyneth ij. c. xvj. ynches; and that shall be your devysore ever in meatynge of *ashelers*.

"Eampylle of meatynge affter the gawge of xij meten, in lengthe xviij yerdes, wyche makethe in fete liiij (54); which makethe in ynches vj. c. xlviij (648), wiche multiplied wythe the gawge makyngeth ynches vij. m^{le}. vij. c. lxxvj (7776), wiche devyded be ij. c. xvj (216) makethe of ashelers xxxvj (36)."

From which it appears that the stones were "squared," and that there were 36 of them in a length of 18 yards, or each stone was 18 inches long and 12 inches high, making a face of 216 square inches.

Brande and Cox define ashlar as being stone reduced to a rectangular form; and

Tomlinson as stone squared and dressed to given dimensions.

Rubble.

Parker defines rubble as "stones not large but irregular in size and shape, and not so flat-bedded as in rag-work; it is generally used for the backing."

American Encyclopædia, as coarse walling of rough stones.

Brande and Cox, as any stone broken from the quarry in rough, irregular masses, and not subjected to any further dressing.

Tomlinson, stones used without being squared.

From the authorities already quoted, it is evident that the chief distinction between ashlar and rubble consists in the shape of the stone, the first being squared, the second *not;* and yet we find a reliable authority defining dressed *rubble* as consisting of *squared* stone (not less than 18 inches high, with no bed less than 18 inches or less than the height of the stone). The term is a misnomer, as such masonry should be classed under the generic term ashlar, and may be either *range-work*, *random* or *irregular ashlar*, or "*rock-face pitched ashlar, etc.*," according to circumstances.

Another authority says "*rubble* will be built of stone at least nine inches thick, and each stone must have one-fourth more bed than rise, and a length not less than twice nor more than four times the rise. The coursing may be irregular." The stones herein described are evidently squared, and consequently cannot properly be classed as rubble.

In addition to the laxity existing in the use of terms, another source of trouble arises from the introduction of impossible conditions concerning dimensions. For instance, the specifications for first-class bridge masonry used on an important railroad read as follows:—

"Courses of stone in abutments, piers and walls are to be not less than *ten* nor more than thirty inches thick. *Stretchers* to be not less than two and a half nor more than six feet long and not less than one and a half feet wide, nor less in width than one and a fourth times the depth." This would make the least allowable depth 14·4 inches, whereas above it may be 10 inches. Again, "*headers* must not be less than three and a half feet nor more than four and a half feet long, where the thickness of the wall will admit of the same, and not less *one and a half feet wide* nor less in width than they are in depth of course. The *joints*, well broken, in no case less than *twelve* inches." These requirements give as the least width of header 1½ feet, and for lap of joint 12 inches on either side, making two feet more or 3½ feet for least allowable length of stretcher, whereas above it may be but 2½ feet.

Since masonry is also specified as first, second, and third-class, it is desirable to prescribe if possible the characteristics of these various classes.

The requirements of FIRST-CLASS MASONRY are found generally to be as follows:—

Courses not less than twelve nor more than thirty inches in height.

Stretchers not less than four and a half nor more than six feet long, height equal that of the course, and width one-fourth greater than the height for courses under 16 inches, and where course is greater it should at least be equal to height.

Headers not less than three and a half feet long (unless in a narrow wall), height equal to that of the course, and width equal to height. The headers should occupy from one-fifth to one-third the face of the wall.

Joints should not be more than three-eights of an inch wide, and the vertical joints should be dressed back at least one from the face. The beds should be dressed true and out of wind. If the surface be "rock-face" it should be pitched and the projections should seldom exceed four inches, though the limits vary from one to six. It is frequently drafted.

In SECOND-CLASS MASONRY the stones are smaller and need not be laid in continuous courses. It therefore includes random, broken-range, and irregular ashlar. The joints are not so closely dressed, varying from $\frac{3}{8}$ to $\frac{3}{4}$ of an inch, but should be horizontal and vertical.

THIRD-CLASS MASONRY consists of rubble either dressed or rough, but well scabbled and with close joints well filled with mortar and small stones (chips or spalls). There should be no spaces greater than six inches to be filled with mortar.

Many combinations may be made of bond and finish, as rock-face pitched ashlar, regular-coursed smooth ashlar, regular-coursed polished ashlar, random-coursed toothed ashlar, etc.

There are also other classes of masonry, based upon its use, as arch, culvert, box, etc., to which the preceding remarks may be readily applied.

Masonry; a structure of stone or brick-work, laid either dry or with mortar.

Cut or Dressed; having at least the joints and beds hewn.

(*A.*) Classified According to Bond. Ashlar.

1. Regular Ashlar; squared and laid in horizontal courses of equal heights.
2. Range-work or Block-in-Course; differs from *regular* only in having courses of less height (7in.—9in.)
3. Irregular, Broken-range or Random; squared stones laid in irregular courses of variable height.

Uncut or Rough; as blasted from the quarry.

Rubble.

1. Coursed; laid in rough courses, without having joints vertical.
2. Rough; laid at random.

(*B*) Classified According to Finish. Ashlar.

Axed; dressed to a plane surface with an axe.

Bastard; a term sometimes applied to combination walls, the face being ashlar; back, rubble.

Boasted or Chiseled; having face wrought with a chisel or narrow tool.

Broached; dressed with a "punch" after being droved.

Broken; six-sided (improperly used. See dressed rubble).

Bush-hammered; dressed with a bush hammer.

Crandalled; wrought to a plane with a crandall.

Diamond work; that in which the face is formed by four planes meeting at the intersection of the diagonals.

Dressed work; that which is wrought on the face.

Drafted; having a narrow chisel draft cut around the face or margin.

Droved, Stroked; wrought with a broad chisel or hammer in parallel flutings across the stone from end to end.

Hammer-dressed; worked with the hammer.

Herring-bone; dressed in angular flutings.

Nigged, Nidged; picked with a pointed hammer or cavil to the desired form.

Patent-hammered; dressed with a patent hammer.

Picked; reduced to an approximate plane with a pick.

Pitched; dressed to the neat lines or edges with a pitching chisel.

Plain; rubbed smooth to remove tool marks.

Pointed; dressed with a point or very narrow tool.

Polished; rubbed down to a reflecting surface.

Prison; having surface wrought into holes.

Random-Tooled or Droved; cut with a broad tool into irregular flutings.

Rock-Faced, Quarry-Faced, Rough; left as it comes from quarry. It may be drafted or pitched to reduce projecting face to given limits.

Rubbed; see plain.

Rustic, Rusticated; having the faces of stones projecting beyond the arrises, which are beveled or drafted. The face may be dressed in any desired manner.

Smooth; see plain.

Square-Droved; having the flutings perpendicular to lower edge of stone.

Striped; wrought into parallel grooves with a point or punch.

Stroked; see droved.

Tooled; wrought to a plane with an inch tool (see droved.)

Toothed; dressed with the tooth chisel.

Vermiculated, Worm Work; wrought into veins by cutting away portions of face.

Rubble. Miscellaneous.

Beton, Concrete; an artificial substance composed of broken stones, bricks, shells or other minerals, of various sizes, mixed with sand, cement and water in various proportions.

Rip-Rap; an apron or revetment of rubble stone loosely thrown into position.

Rag Work; masonry of small flat spalls of slates or shales laid in mortar.

Rough; unhewn stone as taken from quarry.

Dressed; having the joints wrought to a plane surface, but not "squared."

NOTES IN THE WEST.

THE largest church in Devonshire is St. Andrew's, Plymouth. It is the parish church of that town, and is mentioned in a survey so early as 1291, but the main part of what remains is 15th Century work. Its fine western tower was built in 1440 by a rich local trader, named Yogge, and the bells in its belfry rang the joy peal when the British Fleet defeated the Spanish Armada in the Channel hard by. The interior of St. Andrew's was restored by the late Sir G. Gilbert Scott a few years ago. There are twelve other churches in Plymouth, without counting the Citadel church, and Mr. Hansom's Roman Catholic cathedral. Of these, that of St. John the Evangelist, was built some 25 years ago by Mr. Benjamin Ferrey, of Charing-cross, and Mr. James Piers St. Aubyn has had St. James the Less in hand for nearly half that period. When complete, it will do its architect infinite credit. One of the ugliest in the town is St. Peter's, known locally as Eldad Church. This building, built in 1830, stands in the centre of Wyndham-square. The whole, save part of the chancel, is to be entirely rebuilt, from the designs of Mr. Prynne, architect, of 11, Adam-street, Adelphi, W.C. The plan of the new church embraces a spacious nave and aisles. It will have a western tower, with large and ornately-treated belfry windows. The tower will have a saddle-back roof, an uncommon feature in the West. We only know one ancient example of such a treatment in the county. That is at the old church of St. Mary, Combe Pyne, near Axminster, a building restored a couple of years ago by Messrs. Ernest George and Peto.

The parish church of St. Mary at Totnes is having a new east window put into it. The building was for a number of years in the hands of Sir G. Gilbert Scott, and under him partially restored. Messrs. G. G. and J. O. Scott are now continuing the work of their late father.

The new window is a large Perpendicular one in Doulton stone. It is being done by Mr. Luscombe, builder. Totnes church contains the most beautiful rood-screen in the West of England. Unlike all, or nearly all, of these, which are of oak, the screen at Totnes is of Beer stone. It is Early Perpendicular work, and the old colour remains in a very perfect state upon its western side.

A mile from Totnes is Dartington. The parish church there, also dedicated to St. Mary, and built in the time of Richard II., has been pulled down, and a new one is being built upon a site some half a mile away, from the designs of Mr. John L. Pearson, F.S.A., of 46, Harley-street, W. The window tracery, the arcades, the parapets, and the roof of the old building are being reused in the new, and indeed these remains have given the *motif* generally to the design of the present church. It is into the western tower, more than anywhere, that Mr. Pearson has flung all the power of his art. This tower has more of the rich nobility of those found in the neighbouring county of Somerset about it, than of the general run of the plainer Devonshire ones, perhaps. There is a wealth of moulded and crocketed detail about its belfry windows, and sculptured figures in niches will adorn the parapet. The walling generally is of limestone, and the dressings of Bath. The style of the church is Perpendicular. Mr. Jonathan Marshall, of Plymouth, is the contractor. The carving and sculpture has been intrusted to Mr. Harry Hems, of Exeter. Mr. James Bubb, who superintended the erection of Mr. Pearson's clever church in Red Lion-square, Holborn, is the clerk of the works. Another Devonshire church, that of St. James, at Swimbridge, near Barnstaple, is about to be restored under Mr. Pearson. The church has a spire, a somewhat rare feature in the West Country. The parish church of St. Mary Magdalen, at Chulmleigh, is now under restoration. The massive oak seating in the body of the church, and the stalls in its chancel, are being carried out from the designs of Mr. John Gould, architect, of Barnstaple. The fine old western tower is in the hands of Mr. Edward Ashworth, architect, of Exeter, and a beautiful memorial pulpit for the same building is now being made from the designs of Mr. R. Medley Fulford, architect, of the same city.

The Victoria Hall in Exeter, a large public hall, built in 1873, from the designs of Mr. C. J. Phipps, F.S.A., has just been redecorated by Mr. E. Algar, of that city. On the walls are some clever paintings in distemper, by Mr. Widgery, a well known local artist. They represent studies of fine Devonshire scenery. The upper part of the tower of St. Mary's Steps Church, Exeter, is to be rebuilt from the designs of Mr. Edward Ashworth, architect, and tenders are invited. St. Mary's Steps is a curious old church, the western end wall being on a skew, some feet out of square with north and south ones, whilst a little house exists *underneath* the chancel, wherein an elderly female resides. In the tower is an old clock, over the dial of which are three statues representing Henry VIII. and two javeliners. These figures strike the hours.

The parish church of St. Andrew, at Whitchurch, near Tavistock, has just been reopened after a complete restoration. The structure consists of nave, north aisles, south transept, a fine tower, and a north chantry chapel belonging to the Courtenay family (Earl Devon). The chancel is of exceptional length. The roof is waggon-headed, and upon one of the old bosses the date "1656" and the churchwardens' initials still exist. That probably gives the time of the last restoration. The walls of the building, and the granite mullions to the windows, have been repaired where necessary. New stained glass has been put into the eastern and western windows. The tower arch has been opened out, and the lower part of the tower screened from the rest of the church by an ornamental iron screen, which formerly surrounded some monuments of the Pengelly family in the chancel. The approaches have been laid with encaustic tiles, the body of the church reseated, and the chancel fitted with oak stalls, pulpit, and lectern. The chantry belonging to the Courtenay family has had a screen, made of oak and cedar, and originally belonging to Moretonhampstead Church, presented to Whitchurch by Earl Devon. The old font is of Polyphant stone, bearing the arms of SS. George and Andrew. The stained glass work is by Messrs. Fouracre and Watson, of Stonehouse, Plymouth, and the general contractors were Messrs. Blatchford and Son, of Tavistock. The architect for the main portion of the works was Mr. Elliott, of Plymouth, but some was carried out under Messrs. Hayward and Son, of Exeter.

An old Devonshire artist, a R.A., has just passed away at the venerable age of eighty-one. His name was Mr. F. R. Lee, and he died recently at Vleesch Farm, Cape Colony. In his day he was one of the leading landscape painters of the English school, coeval with Linnell, Creswick, Francis Danby, and Sidney Cooper. Born at Barnstaple, he served as an officer in the 56th Regiment, until on leaving it he entered as a student at the Royal Academy in 1818. He was made an Academician in or about 1838. His landscapes, and especially his sea pieces, are of high worth. Four of his works are in the National Gallery. He exhibited at the Academy for the last time in 1869, and retired an honorary Academician in 1871.

Poltimore, the seat of the Earl of Poltimore, lies some four or five miles from Exeter. The ancestral mansion was restored some half-dozen years ago by Mr. B. Ferrey, F.S.A., architect, of Charing-cross. Near the churchyard are some almshouses for four old souls. Over the door of one of these and facing the church is an heraldic memorial in alabaster, recording how John Bampfylde caused the houses to be built and endowed early in the 17th century. Then occurs these quaint lines:—

"GRVDGE · NOT · MY · LAWRELL,
RATHER · BLESSE · THAT · POWER,
WHO · MADE · THE · DEATH · OF · TWO
THE · LIFE · OF · FOWER." 1630.

The church, dedicated to St. Mary, is now under restoration from the designs, and under the superintendence of Mr. R. Medley Fulford, architect, of Exeter. The works embrace, in the main, reseating with massive oak seats the body of the church. An old bench-end existing, the new benches are of a similar character. They have square-headed ends, and are all richly carved. The fine rood-screen, covered with modern paint and varnish, is to be cleaned and restored; new chancel stalls and pulpit will be provided in oak, a new reredos and altar-table, and the chancel cared for generally. Mr. Harry Hems, of Exeter, has been intrusted with the works, which it is hoped will be completed by the end of the present year.

The foundation-stone for the new Exeter school at Victoria-park, St. Leonard's, Exeter, will be laid by the bishop of that city on the 30th inst. Mr. Butterfield, it will be recollected, is the architect.

The other day as the Rev. Wilse Brown, of Whitstone Rectory, was cutting up a thick plank of American walnut which he had procured a few days before in Exeter, he came upon a spherical bullet, about seventy to the pound. It was 7ft. 6in. from the bottom of the plank and 1½in. in. The wood had grown over it, and there was no external mark, so that probably it has been there ever since the days of Cooper's "Hawkeye," or perhaps from a period even more remote.

A scheme has been started for building an arcade in Exeter, such as Birmingham, Bristol, Portsmouth, and many other places possess. The proposal is to pull down the old grammar school at the higher or eastern end of High-street, and run an arcade through to Upper Southernhay. The venture embraces the erection of two front shops towards High-street, and about eighteen more in the arcade, the avenue of which will be covered with an ornamental glass roof. The cost is expected to be £15,000, of which £2,000 has been promised.

In some recent Notes several large mansions in course of erection in the West were mentioned, and one or two others now receive a passing notice. A very magnificent pile of buildings is being built at Sidford, close by Sidmouth, for the Right Hon. Stephen Cave, M.P. for New Shoreham, who owns a deal of property in this part of Devon. The mansion is in the Elizabethan style of architecture, and Ham Hill stone is used largely in its erection. The Ham stone is from the quarries of Mr. Trask. Mr. Brandon is the architect, and the contract is being carried out by Messrs. Lucas Bros., of Lambeth. The work has been in hand about a couple of years, and will probably be complete in another twelve months.

Two fine mansions are nearly finished in the immediate neighbourhood of Crewkerne. One, North Perrott, is for Mr. T. Hoskins. It is of Elizabethan character, designed by Mr. Wyatt, architect, of London. The stonework, which is Ham Hill, has been carried out by Mr. Charles Trask, of Norton-by-Ilminster, the rest of the job being done by men under the immediate supervision of the clerk of works. Seaborough-court, the seat of Colonel Goff, late of the Highlanders, has been entirely rebuilt from the designs of Mr. George R. Crickmay, architect, of Weymouth, and 17, Parliament-street, S.W. The style chosen is Tudor, and very picturesque indeed, nestled in a glen, do the tower, a score of gables, and well chosen chimneys group with the beautiful surroundings. This mansion is of Ham stone like the other two noticed, and is by no means the least successful of the three. Indeed, one may go a long way before coming to a prettier landscape, or to a better built or more thoughtfully designed English gentleman's home than is Seaborough-court. The builder is Mr. Augustine H. Green, of Blandford, his resident foreman of works on the job being Mr. R. Campbell.

THE SUFFOLK INSTITUTE OF ARCHÆOLOGY.

THE annual meeting and excursion of this institute was held on Friday in the neighbourhood of the out-of-the-way town of Debenham. The members met at Aspall Hall, where the annual meeting was held, Professor Babington presiding in the absence of Lord John Hervey. The hall itself, as a paper which was read by Canon Chevallier showed, was a mansion with a history. It has been for nearly two centuries the seat of the Chevallier family, who came from Jersey, and was before them the property of the Brookes, Lords Cobham. Mr. Chevallier even took the history back to the time of the Norman Conquest. The present mansion is, however, of much more recent date, having been built of brick during the ownership of the Brookes, and superseding an older building of timber and plaster. The ceiling of the drawing-room in which the guests assembled is of the period of James I., which may be taken to indicate the date of the house, and upstairs is a fine mantelpiece of similar character. Archdeacon Groome produced an almost perfect Romano-British hand millstone which was found in the parish of Kenton, and handed it to Dr. Taylor for the Ipswich Museum. It is made of the conglomerate locally known as "plum-pudding stone," which is found in its original state at the base of the cliffs near Hunstanton. The different degress of hardness in the stone made it valuable for a mill, as the stone would never require cutting. A short drive took the party to Kenton Church, where the Rev. R. Lawrence, the vicar, read a paper descriptive of the church and parish. The church, dedicated to All Saints, consists of nave and chancel and western tower, south porch of flint, and a small two-bayed aisle of brick on the south side added by the Garneys family as a chantry at the beginning of the 16th century. The oldest part is the south door, which is Transitional Norman. The most interesting object in the church is a brass 20in. by 16in., now in the east wall of the Garneys aisle, in memory of John Garneys, who died in 1524, and of Elizabeth his wife. This is in a good state of preservation, and still has upon it a crucifix and two faldstools, and the effigies of the husband and wife, with their six sons and nine daughters kneeling beneath them. All the letters of the inscription on the brass, instead of being incised as usual, are raised. The church was restored in 1872. From the church the members walked to Kenton Hall, formerly the residence of the De Kentons, but which from close of the 15th to middle of the 17th century belonged to the Garneys. The present building is of red brick of the Tudor period, and is surrounded by two moats. The present owner has recently made an excavation at the back of the hall, which lays bare the foundation walls of a former chapel. The next place visited was Crow's Hall, at Debenham, which was for 200 years the seat of the Framlinghams, whose arms apparently were inserted above the gateway at the head of the bridge over the moat, and are to be seen more perfectly above an altar tomb in the chancel of Debenham church. The present hall appears to have been erected in the early part of the 16th century, and considerable interest was attracted to a curious old staircase and panelled corridor above. The excursion ended at Debenham parish church, where the Rev. C. J. Cornish, the vicar, read a paper upon the history of this fine building. He claimed that the lower part of the tower was Saxon, referring to the two lower south windows, the long and short quoin stones, the absence of buttresses, the herring-bone work on the north side, and the arch entering the church, which resembles that at Godalming, as proofs of this. It was mentioned in Domesday Book that "In Debenham are two churches," of which this was probably one. Passing to the chancel, Mr. Cornish showed that this was Early English, older than the present nave, and that it had twice been altered before the present nave was built. Some interesting discoveries of the former floors and their ornamental tiles were made when the chancel was restored a few years since under the direction of Mr. Colling, architect. The nave is of the Decorated period, largely altered by 15th Century builders, and the stained glass and panelling are as late as the time of Henry VII. Beyond the tower is a western porch or Galilee, with parvise chamber above, of Late Decorated work. After the Reformation the church was despoiled of its images and much of its glass, the latest alteration being the erection of the present pulpit soon after the Restoration. Thus the church contained traces of almost every period of English history.

WOOD STAINS.

TO turn oak black so as to cause it to resemble ebony, the wood should be immersed for forty-eight hours in a hot saturated solution of alum, and then brushed over several times with a logwood decoction, prepared as follows: Boil one part of best logwood with ten parts of water, filter through linen, and evaporate at a gentle heat until the volume is reduced one half. To every quart of this add from ten to fifteen drops of a saturated solution of indigo, completely neutral. After applying this dye to the wood, rub the latter with a saturated and filtered solution of verdigris in hot concentrated acetic acid, and repeat the operation until a black of the desired intensity is obtained. To imitate rosewood a concentrated solution of hypermanganate of potassa is spread on the surface of the wood, and allowed to act until the desired shade is obtained. Five minutes suffice ordinarily to give a deep colour. A few trials will indicate the proper proportions. The hypermanganate of potassa is decomposed by the vegetable fibres with the precipitation of brown peroxide of manganese, which the influence of the potassa, at the same time set free, fixes in a durable manner on the fibres. When the action is terminated, the wood is carefully washed with water, dried, and then oiled and polished in the usual manner. The effect produced by this process on several woods is remarkable. On the cherry, especially, it gives a beautiful red colour.

TIMBER FROM STRAW.

WHETHER or not bricks can be made without straw, an American inventor, of Busnell, Illinois, has, it is said, succeeded in making hard wood with nothing but straw. To make hard wood lumber out of common wheat straw, with all effects of polish and finish which is obtainable on the hardest of black walnut and mahogany, at as little cost as clear pine lumber can be made up for, is the claim of the inventor, and samples produced go far toward verifying his claims. The process is as follows: He takes ordinary straw board; such as is usually manufactured at any paper mill is used for the purpose. As many sheets are taken as are required to make the thickness of lumber desired. These sheets are passed through a chemical solution which thoroughly softens up the fibre, and completely saturates it. The whole is then passed through a succession of rollers, dried and hardened during the passage, as well as polished, and then comes out of the other end of the machine, hard, dry lumber ready for use. The inventor claims that the chemical properties hardening in the fibre entirely prevents water-soaking, and renders the lumber combustible only in a very hot fire. The hardened finish on the outside also makes it impervious to water. Some samples recently shown could hardly be told from hardwood lumber, and in sawing it the difference could not be detected.

THE "BUILDING NEWS" DESIGNING CLUB.

REVIEW OF DESIGNS FOR LABOURERS' COTTAGES.

OUR endeavour to be impartial in our selection must not be misinterpreted by the necessity which often compels us to place the designs with certain mottoes in the foremost rank. Reluctantly we are again compelled to place "S in Circle" in the front rank. The plans of the cottages are tolerably perfect and simple. Each cottage has a lobby, taken out of the living-room, forming a useful recess in the latter, with a staircase ascending over a coal-store or closet; the living-room is 13ft. by 12ft., and opens directly into a kitchen, 13ft. by 9ft., in which there is the door to coal-cellar, and on the outer side, with small window facing the back, a pantry or cupboard. The earth closet, ashes, &c., form an outside lean-to range arranged in pairs. The wash-house and bakery is placed as a detached block in the centre behind, but it would have been better if the doorways were placed round to the front instead of being on one side only. The end cottages are made wider, the lobby being entered from the side, and a small scullery is obtained below the additional bedroom. The upper floor is simply managed, and closets are obtained in some instances. The elevation leaves little to be desired; there is no strained or quaintly affected feature, but the whole is of brickwork, with tiled roofs, relieved by two gabled windows in the upper story. The design of "Motto J.," although not so neatly drawn, is marked by characteristic vigour and effective detail. In plan the cottages are well grouped; the lobbies are entered from a recessed porch, which unnecessarily cramps the stairs and dresser recess of the living-room. A cupboard —we presume for coals—is obtained under the stair of each cottage. A kitchen, with side pantry, is obtained behind; but the offices are undesirably placed at the side of the bake and wash-house in a detached position behind. The five-room cottages are obtained at the two ends and in the centre. The setting back of the upper story walls, which are of timber framing, thereby reducing the width of the bedrooms, is undesirable, and certainly does not save expense with the lean-to roof it entails. "Noah" is a design marked by unusual ability and freshness of treatment, the materials proposed being flint and red brick, with a red tile roof broken by two half-timber gables. The cottages are varied; two of them have a bayed window between them, which is gabled above. There is not much to find fault with in the arrangement: each cottage has a front parlour about 12ft. square, opening into a back kitchen of the same size; the entrances are obtained as in the two former cases, by lobbies, each staircase ascends at the side of living-room, with a press-cupboard below it with door in living-room. At the side of kitchen is a dresser and pantry, with back yards for fuel, e.c.'s, and dust-pit. The bake and wash-house are planned in a separate block behind the two middle houses, but accessible only by passing beyond the back yard wall. We notice one of the two back bed-rooms shown is rather small. One of Powel's ovens is specified to be fitted in the bakehouse. The plans are economical, but the beds are not all shown in the best positions. A very neatly-contrived plan is shown by "Triangle in Circle," the principal point to be noticed in which is, that the author makes each of the four-room cottages occupy an area of only about 21ft. by 15ft. 6in. frontage, and the five-room cottages an area of 23ft. by 16ft. 6in. each. The plan resembles those we have before already described, each cottage having an inner lobby, entrance stairs with winders leading from living-room, which is 12ft. 3in. by 10ft. 6in., and a scullery with pantry behind. A closet is obtained beneath the stairs. Economy in building has been consulted by drawing the chimney-flues together into one stack in the upper floor and having angle fireplaces. We think the plan of grouping together the coals and earth closets in the rear, at the side of bakery and wash-house, objectionable, and the coals are too conveniently within the reach of pilfering neighbours. The bake and wash-houses are well fitted up, and the dust is located conveniently behind the earth-closets. Two treatments are shown in the elevation, which is simple and economical. "Star in Circle" sends a quiet and suitable elevation, the upper story tiled. The entrance-doors are arranged singly, and there are advantages in this. The lobbies, stairs, living-room, and scullery, with larder, are planned similarly to those already noticed, but the wash-house is made to project from the centre cottages, and is accessible from a continuous passage-way in the rear. The oven is placed in one corner, an arrangement that is not very nice. We do not see the advantage of the very small back yards, nor the reason for a paled fence as well as a back wall. In one of the five-roomed cottages the extra bed-room is got over the scullery of the end house by piercing the party-wall. We do not commend this arrangement. "Mente Manuque" is clever. The plan is a departure from the ordinary type; the end cottages are made to project considerably in front of the main line, and the wash-houses are arranged in pairs in the rear, and are divided by the party-walls of the adjacent houses. The entrance-lobbies with staircases arranged in front afford a direct view of the kitchens and is not the most satisfactory or pleasing mode of planning, nor the most economical. The bedrooms are of good size. We observe an oven is placed in each wash-house, the coals and e.c.'s being attached in the rear. The elevations are in brick with half-timbered upper story, gabled, and suitably treated, but the rather broken line of frontage is not economical. "Ich Dien" is plain and unaffected in elevation, the upper story being tiled, but the ground-plan is faulty in the management of the entrances and the position of pantry with borrowed light. The scullery and bakehouse form one building in the rear. The author cubes his cottages at 6d. and 5d., and brings them to £1,867. We cannot seriously regard the design "Maggie, alias Such a Dog," as anything more than an unfinished suggestion; it is too roughly drawn to enter into competition with the other contributions, notwithstanding its merits. The author sends a practical and cheap plan. The living-room is 13ft. square, entering into a scullery with a larder and tool cupboard on one side and earth-closet and oven on the other; but in apparent forgetfulness of the condition that a wash and bakehouse had to be arranged in the rear. We can only judge of the elevation by the fragment of it that is finished; and the drawings are too smudgy to be fairly considered in the running. "Burswell" has a tolerable plan, but we do not like the position of larder; the wash and bakehouses are too large, and the elevations rather roughly finished. In the sketch the chimneys are in faulty perspective, and a little more study of detail is required. What is the intention of the wall shown in cross section running up to the slates? "Enigma" shows improvement; the middle cottages are made wider than the end ones for the purpose of getting the three bedrooms over. The offices in the scullery are not arranged in the best manner, though compactness has been secured. We cannot admire the dormer windows of the centre houses. "Peter" sends a design not devoid of merit; the cottages take up little area, and the rooms and entrances are arranged with care; the bakehouses are made to form projecting buildings one to each pair of cottages, having the oven built between the kitchens, by which means heat would be utilised. The earth closets and dust are attached to the rear of the bakehouses. In elevation there is much to commend; but why should not the back instead of the front bedroom have been divided? "Eleve" is a neatly-drawn set of plans, but we do not like the pantry with borrowed light; it is, moreover, too large, while the scullery and kitchen in in some cases are cramped. The omission of lobby entrances to two of the cottages is objectionable, and the offices need rearrangement. Elevation is too broken. Why the break over centre porch? We observe the wash and bakehouse are placed at one end in rear of yards. "Curiose" is not happy in the arrangement of his offices; the sculleries vary greatly in size, and the end block is not so well worked out in the plan as it might have been. The wash-house, bakery, and sheds for e.c.'s and fuel are intended to be placed in the rear. A half-timbered upper story with Broomball tiles are shown, and the cost of each cottage is estimated at £148 16s., but 3½d. is too low a price. "East Anglian" sends a neat drawing, showing the cottages somewhat after the fashion of semi-detatched blocks, with scullery, bakehouse, and offices forming a projecting wing behind. The elevation would have been better without the strip of tiling under the timbering, which gives a patchy effect. The style chosen is too costly for labourers' cottages. "Omnia Vincit Labor" is rather too straggling in its offices, though simple in other respects, and if a better elevation had been shown, without the huge gable in the middle, the design would have stood higher. The sketch does it justice. The cubing is priced at 5d. = £1,152. "Tam O'Shanter" sends an elevation of some merit in the grouping, though rather weak in detail; the ground plan is spoilt by the range of fuel and e.c.'s at the back, in the centre of which is placed the baking and washhouse. A passage way is left in rear of houses. "Semper Paratus" is wasteful in its office arrangement, and the elevation is not improved by the small gables filled with timbers. "Ogmore" is also extravagant in the office portion, the wash and bakehouses are placed at the side of the living-room or behind it, with the other offices attached forming projecting wings in the rear. Elevation faulty in detail. "Ivanhoe" has expensive front passages and the offices are not shown fully. Elevation and perspective view are carefully drawn, but the gabling and diversity of treatment is overdone, and gives a broken effect. "XL.," are neat, but scarcely cottages in elevation; no entrance lobbies are shown. The offices, &c., are not arranged with economy, and are awkwardly placed to inclose the yard instead of being kept out of sight of the windows. "I strive" is certainly better in planning, but the elevation has more the effect of a small asylum than a row of cottages. "Veritas Vincit" is too expensive; its front passages and back arrangements are not economical; elevation is better, except the lumpy chimney caps.

DESIGNS FOR A GARDEN-SEAT.

This subject has called forth some ingenuity in contrivance, and though we cannot say that any design quite reaches the excellence we expected, "Noah" comes nearest to it. In plan the seat consists of a series of six chairs, hinged together at the backs so as to be capable of being made to form two straight seats back-to-back, or any other arrangement. One of the arrangements shown is a circular one, the seats being disposed hexagonally round a tree. Each seat has a plain rectangular-shaped back or frame, filled with bamboo canes, which are disposed in a radiating form, &c. The side uprights of backs are hinged together, and the front legs are provided with bolts. The seats are intended to be painted sage green. A little more slope would have been desirable in the seat itself, so that any water may run off freely. "Motto J." is the sketch of a design displaying much taste. The seat is a straight and fixed one with return ends, having arms, turned balusters; panels of Japanese character fill up the sides under the capping. We do not like the curve of end arms—they would be difficult to cut out of a straight-grained piece of stuff, and the back rail upon seat prevents water from running off. "Jack' is more quaint than clever. The ends are peculiarly heavy in the framing, without much beauty or fitness being evident. Why the singular arm? The panels are here and there pierced in a kind of Japanesque pattern, others are flush framed, with sunk beads in the stiles. The plan shows a curved arrangement in two, with a shelf and back filling up the obtuse angle between each seat. An awning may be fitted by uprights fixed into the framed ends. Below the shelf are racks for croquet or lawn-tennis. Oak, tenoned together with oak pins and without painting, is proposed. "Prenez Garde" is a framed covered seat of oak, roofed with shingle, Gothic in detail and effective. "Ogmore" sends a design in cast-iron, double seat with centre back, but the end seats are not well devised for comfortable leaning. A close scroll-work pattern is shown. "Stefano" is another cast-iron seat, with a portable awning over, but the pattern is too directly imitational of the fern to be in good taste.

AMERICAN JOINERY.

THE Baltimore *Sun* describes a new American enterprise in the exportation of machine-made doors, windows sashes, window blinds, and similar articles of joinery. The first shipment to England of this sort of goods took place in 1877, and although it was confined to doors for the cheaper class of houses, it at once met with a demand that justified the expectations of the shippers. A few window-sashes and blinds were also sent; but they were chiefly intended for the British provinces, as Venetian blinds—so the *Sun* says—are not used in England. This new trade is, however, only in its infancy. For the first time, in 1877, some 19,000 doors and 6,284 pairs of sashes and blinds were shipped from New York to England, the greater part of which went thence to Australia and New Zealand. Since then California has supplied machine-made joinery to Australia, sending there 27,000 doors last month as against some 5,000 sent direct from New York. But the transfer of the Australian demand for machine-made doors to California, and its consequent loss to the Eastern States, has been compensated for by an increase in the British demand for local use. The shipments of doors to England and Scotland in 1878 were about 45,000, as against 2,800 in 1877. Up to June of the present year these shipments show a slight increase. It is a trade that is evidently capable of great extension, for all the pine lumber used in England is brought from Norway and the United States. It is a trade, too, that affects the English workman in two ways. For many years past there has been a large annual demand upon England from Australia and other British dependencies where wood of the proper kind is scarce for the doors of warehouses and private dwellings, and to economise the cost of the doors so exported they were made up into packing boxes, four doors placed longitudinally forming each box, the two ends being doors for small closets. As all the doors were hand made, the trade of making them gave employment to quite a large number of English workmen, and the diversion of this trade to California, coupled with the demand that has sprung up in England itself for the machine doors of the Eastern States, must, the *Sun* thinks, cause a good deal of anxiety among English joiners and carpenters in the present depressed condition of the labour market there.

ENGINEERING IN ENGLAND AND AMERICA.

THE future of American engineering was the theme of an eloquent address lately delivered before the Engineers' Club of Philadelphia, by its president, Mr. Thomas C. Clarke. Mr. Clarke dwelt mainly upon the education and duties of the engineer. His first demand was to make an honest living; his next to execute some work that shall call out his abilities and promote his fame, and lastly to pay the debt which every man owes to his profession by making some permanent addition to knowledge. But, as the president took care to say, it was not every one who succeeds in all these three desires. In America we take it there is far more chance for a young man to attain these three objects than in England. As regards the preparation and education necessary, Mr. Clarke briefly divided it into two kinds, that derived from books, and that obtained from actual practice and from contact with men. Both kinds, said the president, are absolutely necessary, and we heartily commend similar advice to the young architect as well as the engineer. "The broader and deeper the foundations of his knowledge are laid the more readily and intelligently will he acquire the second, and the more satisfactory will be the results of his practice." The chief thing to consider, we take it, is the direction of those studies. Of course, there is some book-knowledge necessary to every engineer and student of architecture, such as a fair acquaintance with mathematics, physics, chemistry, &c., upon which to base an acquaintance with construction and the materials he works with. But it is after this general knowledge of principles has been acquired that we find the difficulty begin with many students. The young engineer is articled to some eminent man in his profession—perhaps engaged in railway construction, and he finds to his chagrin that he has to learn a new vocabulary, so to speak; he has to apply his previously-acquired book-learning to actual facts, to structures of iron and wood. Now, without some preparation for this new mode of labour, the young pupil finds his way beset with difficulty. He has never been brought to face concrete facts and tangible ideas relating to material and construction, and in this state of bewilderment he remains unless he is brought into contact with the works or the workshops. The technical school is the only remedy at present for this state of things. In the older days of engineering the student began his special training in the workshop, or the field, just as many of our older architects worked themselves upwards from the bench. The weak point of the old system, observes Mr. Clarke, "is, that while it produced many great men yet the average did not stand as high as now; and the expenditure of much capital had to be intrusted to ignorant persons, whose blunders led to enormous waste, and whose names are now happily forgotten, together with their mistakes." We have not to go far to find proofs of this sort of blundering. Railway engineering supplies numerous examples, in the wasteful modes of embanking, tunnelling, bridge and viaduct construction, but our experience rather goes to prove that the modern engineer, if he is more artful and parsimonious, is often equally wasteful. Many of our old constructions do honour to the pioneers of the profession in England, while works of more recent date, which have arisen since the employment of iron and the contract system, attest a false and niggardly economy, often misapplied in its disregard of permanence and durability.

Mr. Clarke enters into other qualifications necessary to the successful engineer. One of these is tact and the power of controlling men, and without some measure of this few engineers or architects ever make headway, however able and talented they may be. We can hardly think that "American engineers are less esteemed and worse paid than in any other civilised country of the world." America has furnished a splendid field for engineering enterprise since the railway mania in this country subsided; few countries have given more scope to engineering ingenuity and contrivance; and the very vastness of some of the works already accomplished bear testimony to the encouragement that has been given to the engineer. But few countrymen think they are well paid at home. We have always thought that the great Western States afforded the greatest inducement to the engineer; they are passing through the engineering stage of their civilisation, whereas in this country the great railroads and means of communication have already been accomplished, and the future is as much dependent on the mechanical as the constructive or civil engineer. Mr. Clarke himself shows how numerous are the paths open to the young man in this profession. As a scientific constructor, the history and progress of American engineering shows how the civil engineer has expanded. Before the year 1828 an engineer meant a man who knew how to make canals and waterworks. It was, of course, precisely the same in this country. After George Stephenson's time the engineer was a man who had to construct railroads. In the United States alone 85,000 miles of railroads were constructed at a cost of over four billions and a half of dollars. A new profession arose soon after: it was that of constructing and maintaining railways. This wonderful activity led to a demand for various specialists. The introduction of iron for railway purposes necessitated a profession skilled in construction of another sort; the old railroad engineer might have understood well the construction of timber viaducts and masonry bridges, but the knowledge of the arch was of little use in the design of structures in which iron was wholly employed, and where it had to be used with the strictest scientific economy. The resistance of iron to various strains had to be obtained first by experiments, and the results expressed in formula; the strains of every member had to be nicely calculated, and the weights adjusted. The substitution of wrought for cast iron naturally led to the necessity for nicer and more accurate theories, till now the railway engineer must above all become an expert in iron construction. Another opening was due to the development of our mineral wealth; it has led to a new and distinct class of engineers, which number some thousands on both sides of the Atlantic. In both countries also, and particularly in England, sanitary reform has called out quite an army of specialists, including hydraulic and sewerage engineers, besides those engaged in the construction and maintenance of roads, water and gasworks. The electrical engineer is another new creation within the last few years. Boston, we hear, is now expending five millions of dollars in improved sewerage works, equalling, if not surpassing, the main drainage of our metropolis. Chicago has been raised above its original level, and, metaphorically, its engineer, Mr. Chesbrough, is said to have lifted a city of 300,000 people 10ft. up in the air. Sanitary engineering is a special branch that includes both the civil engineer, who prepares a scheme of drainage, and the plumbers of our dwellings. Much might be said of their labours, but we mention them chiefly because they represent quite a new field of enterprise, and because their education has to depend on very different principles, less exact in their nature, in which hydraulics, and practical chemistry, and hygiene are chiefly concerned. *En passant*, we may observe engineers of this class are self-educated, and have had little or no systematic training for their work—a remark which explains much of the conflict of opinion that prevails among sanitarians with respect to sewage disposal and ventilating schemes. A large number of them have picked up their knowledge in the most prejudiced of schools; some have become speculators and theorists, others quacks. We are quite of the opinion of Mr. Clarke, who, while speaking highly of the scientific attainments of our gas engineers, observes the result of their labours may be seen rather in "the increase of dividends than in the lower price of gas." Agricultural engineers are another class who have, to use the words of the president, "an enormous future before them in this country." The author does not forget the architects, of whom he says they ought to be engineers, *i.e.*, scientific constructors, or so much the worse for their buildings. Finally, there is a class whose services are said to be more in demand every year, namely, contractors' engineers. Some of the ablest of our engineers belong to this useful and responsible body. Bringing experience of actual work to their knowledge, they are generally the most successful. As Mr. Clarke says, the engineer must be more than a designer or measurer of masonry and earthworks; he must be first a mechanical engineer, skilled in statics and dynamics, machinery and tools, able to construct and report upon mills, factories, machinery, and manufactures; be able to take part in matters of business, hire men, and buy materials, and execute his own designs if necessary, learn to be men of business, and control the cheque-book and ledger. We quite appreciate the value of this advice, and can call to remembrance other cases where, "in looking for the engineer of some great railroad, have been disgusted to discover him hidden away in a dusty office on the upper story of a building, ignored by everybody," while the ticket agents and clerks sit in splendid apartments and draw large salaries. The latter are first-class business men, the poor engineer is not; they are clever in accounts and sharp in expenditure, while the young but unbusiness-like engineer overruns his original estimates of cost and loses the confidence of his patrons. Mr. Clarke's views of American engineering are certainly not gloomy. America has been made what she is by her engineers, whether called by that name or not: let us add that this has been rendered possible by her own independence and by the unconventional freedom she accords to the professional classes.

FIREPROOF PARTITIONS.

A PROVINCIAL builder, who is not acquainted with London practice, would be surprised to find that the inside partitions of most of the houses in the suburbs are constructed wholly of timber framing, and that the rooms of several stories are divided in this manner. The house, in fact, is nothing more than a shell of brickwork with partitions of wooden studs. How such a mode of construction can be tolerated, in utter contempt of all sanitary precautions, it is not easy to conjecture, but leasehold tenure encourages the system, and surveyors themselves wink at it. Of course this method expedites the erection of houses, and we would not complain if they were filled in with brickwork, or if the joists over the heads of one partition and its lower portion were filled up with incombustible material, so that a fire may have less chance of destroying the partitions above it. In Paris, as everyone is probably aware, timber framing is largely resorted to, but the spaces between the uprights or quarters are built up with rubble laid loosely, and then plastered on both sides to fill up all interstices, so that, practically, a fire-resisting partition is the result. Our system of brick-nogging is a somewhat analogous operation, and answers tolerably well if properly done. In France the usual operation is as follows:—The framed partition is inclosed on both sides by strong oak batten laths about 3in. wide, nailed horizontally about 6in. apart; within this the spaces are loosely packed with rough stone, and a strong mortar or plaster of Paris is laid on from both sides at the same time, and pressed through the interstices, so that the rubble becomes embedded in the mortar, consolidating both it and the timber. The surfaces are also covered so that the laths are hidden entirely. In this way a thoroughly concrete partition is formed, more effective and self-supporting than the brick wall; certainly superior and more durable than the English brick-nog partition, and throwing all ordinary plastered partitions into the shade. The brick-nog partition often fails, when the timber decays, the bricks are not held together by a strong and independent thickness of plaster. The common hollow plastered partition becomes a nest for mice and a receptacle for vermin and dirt, and when a fire occurs it forms the means of communication between the floors, and affords a channel for the supply of air. It is strange that although these facts are patent to every practical builder, architects and builders still adhere in an obstinate fashion to the plastered partition and the hollow wooden floor. We have constantly advocated floors, staircases, and landings particularly of concreted and incombustible materials, and though the idea is recognised and carried out in all large and important buildings, the ordinary dwelling-houses are allowed to be exempt from such salutary provisions. We called attention some time ago to the value of concrete in wall-building, and suggested the use of light timber lattice framing filled in or compacted with concrete. In a recent number of an American journal we find the same idea has been thrown out, and the writer gives a diagram of the system. The plan we suggest is to form a rough lattice of battens or strips 2½″ × 3″ or 3″ × 2″, with spaces of 4in. or so apart, to fill up both sides with lime concrete, and to finish the two sides by a coat of plaster of the usual thickness. This construction would be cheaper than framing, and be admirably adapted for internal partitions, and for all temporary buildings.

It is occasionally necessary to divide an upper room into two by a partition, and to relieve the floor of unneccessary weight it becomes necessary to truss the former. Now the lattice partition or wall we have referred to becomes a self-sustaining structure, and may be supported easily by corbels at the ends. We are led, in speaking of weight, to say a word in favour of earthenware pottery as an excellent substitute for rubble or stone concrete. Common agricultural drain pipes of small diameter have been introduced by Mr. Pritchett for this purpose, but any kind of cellular construction may be adopted. It is to be regretted that architects do not adopt more largely the indestructible forms of partitions we have mentioned, and thus render a service to both sanitary construction and sound building. It is not less surprising that such ordinary precautions to insure buildings against fire, such as incasing and rendering solid the floors and partitions, should have escaped the vigilance of those who frame our building enactments.

CHIPS.

A statue mania has of late raged in France. Rabelais is to be thus honoured at Chinon, and Béranger and Théophile Gautier are also put forward for this species of commemoration. Last week a statue of General Foy, the Liberal orator of Louis XVIII.'s reign, was unveiled at Ham, his birthplace.

M. Louis Favre, contractor for the Gothard railway, died on Saturday last at Göschnen. M. Favre was a native of Geneva, and the announcement of his death, at the moment when the completion of the great enterprise with which he had been connected from its inception had become a question of time, has been received with profound regret.

A new Primitive Methodist chapel at Wolstanton was opened on Sunday week. The chapel is in the Italian style, built from the plans and designs of Mr. A. R. Wood, architect, Tunstall. The front is of red brick, with stone dressings, terra-cotta being introduced. The chapel is calculated to seat about 500, and the total cost, inclusive of the land, will be about £2,500. The contractor for the building is Mr. Proctor.

The new church of the Holy Trinity, Rudding Park, Knaresbro', designed by Mr. A. E. Purdie, architect, for Sir J. P. Radcliffe, Bart., will be opened by the Bishop of Leeds on August 1st.

COMPETITIONS.

Ramsgate Proposed New Road Competition.—A meeting of the Local Board was held on Friday last, when the chairman stated, at some length, that in respect to a report of the committee of the whole board, he had seen Mr. Abernethy, who advised the board to have a plan of both the road and the proposed extension of the London, Chatham, and Dover railway prepared, with proper estimates, and then ask Mr. Forbes for his sanction and co-operation in the matter. It seemed to him (the chairman) that it would be a good idea to ask Mr. Cummius, the author of the "Desideratum" plan, to look through the matter, and then for him to draw up a scheme in connection with the two affairs. Mr. Abernethy and Mr. Cummins could be invited to meet the board and learn their views on the matter, and then have a proper scheme prepared for uniting the two things to lay before the town, which he always said should be done before the matter was finally settled. He did not think the town would ever have the road unless it was in conjunction with the railway company. Mr. Pett spoke against joining with the railway company, and moved as an amendment—"That no plan for connecting the east and west cliffs will meet the requirements of Ramsgate unless the road be a direct front road; and that the plan signed 'Desideratum,' or any other plan taking the same route, be not approved." Mr. Pett, before concluding, drew forth a plan which he had prepared, and stated that he could prove that the estimate could not be more than £40,000 or £50,000. Mr. Pilcher seconded the amendment. On the chairman putting the amendment of Mr. Pett to the meeting, only that gentleman and Mr. Pilcher voted in favour of it. The report was then adopted, and Messrs. Abernethy and Cummins were invited to attend a meeting of the board as the chairman suggested.

Shepton Mallet District Hospital.—The committee of the hospital have now decided on the design to be adopted for the proposed new building, to be erected on the site purchased in the Waterloo-road in this town. Some weeks back it was decided by the committee to advertise, inviting architects to submit plans which would undergo a competitive examination. This was done, and the result was that sixteen designs were sent in to the committee under motto. These sixteen were weeded down to three, which then underwent further scrutiny, eventually resulting in the selecting of a design which was found to be sent by Mr. Skipper, of East Dereham, Norfolk, the second design being the work of Messrs. Budd and Spire.

Wandsworth.—A new vestry hall is about to be erected at Wandsworth, and for this purpose the local authorities invited five architects to submit designs in a limited competition. The award has this week been officially made known to the competitors, the selection having fallen upon the design submitted by Mr. Geo. Patrick, A.R.I.B.A., architect of the Adelphi. The other competitors were presented with £15 each as a slight compensation for their trouble.

Wolverhampton. The park and baths committee of the town council of Wolverhampton recently advertised for plans, specifications, and detailed estimates for laying out the interior portion of the park, at an expenditure not exceeding £5,000. The first and second successful competitors to be entitled to a premium of £50 and £25 respectively. Twenty-seven designs were received and placed in the council-chamber for public inspection. The borough surveyor's report was submitted to a special meeting of the committee on the 13th June ultimo, and as a result three designs, viz., "Spe Labor Levis," "Al Fresco," and "Fortuna Sequatur," were selected for further consideration and a detailed report. At a subsequent special meeting of the committee, on the 20th June, a further report from the borough surveyor was presented on the three mentioned designs (and on the one under the motto of "Sylvander" at the request of the chairman). After careful examination of the plans, and upon a division of seven votes to two, it was resolved, "That the first premium of £50 be awarded to the author of the design "Spe Labor Levis," and that his design be accepted as the one to be carried out if all the conditions stipulated are complied with." It was also resolved "That the second premium of £25 be awarded to the author of the design 'Fortuna Sequator.'" Mr. R. H. Vertegans, of Edgbaston, is the author of "Spe Labor Levis," and

Messrs. W. Barrow and Sons, of Derby, are the authors of "Fortuna Sequatur." The report of the committee has been adopted.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Bedfordshire Architectural and Archæological Society at Leicester.—The place chosen for this year's excursion, which took place on Tuesday week, was Leicester, and was made under the guidance of Mr. A. H. Paget, a member of the local society. The members first visited the Newarke, the portion newly added to the castle by Henry, Earl of Lancaster. The breaches made in it by the Royalist attack at the siege in 1645 are still traceable. Trinity Hospital, founded in 1300 by Henry, Earl of Lancaster, for poor, infirm men, was next seen. The chapel contains an interesting alabaster effigy, supposed to be that of Mary de Bohun, first wife of Henry IV. In the kitchen stands an ancient porridge-pot of formidable dimensions. The original front of the house being dilapidated, was renewed, and the present unsightly frontage made by blank walls built up within the arcade of the central hall in the reign of George III. The castle hall has a romantic history; and the chief portions now standing include the great hall, 78ft. by 51ft., now partitioned off and used as assize courts, and the early dungeon. The Church of St. Mary-in-the-Castle would alone have repaid the exertions of the day, and would, indeed, if minutely examined, have occupied the larger part of it. The story of its successive changes was patiently traced out from the Norman period to the recent costly restoration under Sir Gilbert Scott by Mr. Paget and the Vicar, Canon Broughton. The next church on the route, scarcely less interesting, was St. Nicholas, bearing ample external evidence of having been largely indebted in its construction to Roman remains found in its immediate neighbourhood. Here the incumbent, the Rev. T. W. Owen, pointed out the structural history, from the Early Norman windows recently brought to light in the clerestory during restoration and the herring-boning in the tower, to the present time. In close proximity to the churchyard stands the famous "Jewry Wall." On the east, the exposed side, it is pierced by a series of four massive arches, with a central recess of brickwork, turned in a mass of rubble, bonded at intervals by courses of quarry tiles. These arches are respectively 11, 12, 13, and 14ft. high and 14, 6, and 11ft. broad. From the relative position of other Roman buildings, traces of which have been discovered, it is evident that this wall formed some part of a cluster of edifices extending from the spot towards the river, and forming a portion of *Ratæ*, or Roman Leicester. In the afternoon the noble Church of St. Martin was inspected. Other objects of interest examined were the Guildhall, the town library, the Mayor's parlour, the church of All Saints, and St. Margaret's, closing with an hour in the museum.

Surrey Archæological Society.—This society held on Monday its first annual country meeting, under the presidency of Lord Hylton, who received the members at Merstham-park. From thence they proceeded to Merstham Church, where a paper descriptive of its history was read by Mr. Nevill, F.S.A., who was followed by Mr. J. G. Walker with an explanation of the celebrated mural paintings. Chipstead Church was next visited, the edifice being described by Major Heales, F.S.A. Thence the party went to Gatton Hall, by permission of Mr. R. McCalmont. At Gatton Church Canon Cazenove, the rural dean, called attention to the beautiful woodwork brought from Flanders, and Mr. W. G. Leveson Gower, F.S.A., standing beneath the tree which formerly served, and indeed is still known as, the Borough Hall, read a paper on the Parliamentary history of that very rotten borough. The meeting closed with a collation at Reigate Public Hall, at which Lord Hylton presided.

The Excavations at Dale Abbey, near Derby.—These excavations have been actively resumed under the auspices of the Derbyshire Archæological and Natural History Society. A part of the cloister tile pavement has been discovered *in situ*, with portions of a still earlier pavement. The turfing of the choir has been completed, and a wall has been built in lieu of a hedge on the western side of the slype and chapter-house. A fine floriated capital, and part of a beautifully carved corbel, representing a lady's head in the "wimple," have recently been discovered. The perpetration of some wanton mischief within the inclosure, by which the effigy of a prior in the chapter-house has been scattered in pieces, has led the committee to offer a reward for the detection of the offenders.

PARLIAMENTARY NOTES.

Rivers Conservancy Bill.—In reply to Mr. Harcourt, the Chancellor of the Exchequer said, on Monday, that it was with regret the Government found themselves unable to proceed with the Rivers Conservancy Bill this Session. They had every intention of introducing a similar Bill next Session.

The Horticultural Gardens, South Kensington.—In answer to Mr. Yorke, the Chancellor of the Exchequer stated, on Monday, that plans for the utilisation of the ground now occupied by the gardens of the Horticultural Society at South Kensington were under the consideration of Her Majesty's Commissioners of 1851, and that the decision arrived at would, no doubt, be in accordance with the original design of employing the estate for the promotion of science and art.

LEGAL INTELLIGENCE.

Jerry Building at Tottenham.—On Monday, at Edmonton Petty Sessions, James Wheeler, builder, of 4, Woodberry-villas, Seven Sisters-road, Tottenham, was charged upon eight separate summonses, at the instance of the Tottenham Local Board of Health, with having infringed the provisions of their 8th by-law, which is as follows:—"The external and party or side walls of every new building constructed of brick, stone, or other hard substance, shall be efficiently and solidly bound and put together with mortar or cement; and the brick, stone, and timber used on every new building shall be substantial and sufficient, and for the purpose of securing stability to new buildings, the mortar and cement, bricks and timber used, or intended to be used therein, shall be subject to the approval of the local board." Mr. W. A. H. de Pape, surveyor to the Tottenham Local Board, deposed that on the 15th inst. he inspected eight houses in course of erection on Todd's Estate, in Templeton-road, Seven Sisters-road, and found that at the back of the building, straw, wood, shavings, and vegetable matter were being laid as mortar between the joints of brickwork. Witness told defendant, who was on the buildings at the time, that it was a disgrace such stuff should be used for mortar, and proceeded to take samples of it, now produced. Defendant asked witness not to press the matter; but he replied that it was the worst instance he had ever known, and he should certainly press it. The sample of so-called mortar he produced, in his opinion, consisted of feathers, cocoa-nut fibre, wood, labels, grass, twine, leaves, shavings, straw, and mould. Objection being raised to the general sample being accepted as representing the material used in all the houses, separate samples labelled individually from each house were laid before the bench and presented no perceptible difference in character. In cross-examination Mr. de Pape said he did not give previous notice to defendant. Defendant's solicitor submitted that the bench could not commit under a penal clause in the by-laws because the local board had not been themselves to inspect the premises, and that they had no power to delegate their functions to the surveyor. This objection was overruled, when the solicitor said that the samples produced were not fair ones, and if a conviction were enforced he should appeal. He called William James, foreman of building in defendant's employ, who produced a sample which he said was a fair specimen, but which Mr. de Pape declared to be as bad as those he had shown. The full penalty of £5 and costs were imposed on the first summons for one house, with the alternative of fourteen days' imprisonment in default of distress. The other seven cases were taken *seriatim*, the Bench overruling an objection that the houses formed part of one and the same building, and the full penalty of £5 and costs was imposed in each case, with the same alternative of 14 days' imprisonment.—Arthur Jukes, of Tottenham, who had been before convicted, was mulct in a similar penalty and costs for using improper mortar in Tewkesbury-road, also on the Todd Estate. Notice of appeal was given by both these defendants.—William Waller, of Tottenham, for a similar offence in respect of one house in Templeton-road, was fined £5 and costs, which were paid.—At the meeting of the Tottenham Local Board, on Tuesday night, the clerk reported the successful result of the above proceedings, and Mr. de Pape urged the necessity, if the Board possessed the power, of causing the whole of the back additions to Wheeler's eight houses in Templeton-road to be pulled down. The £5 penalty was no deterrent to such persons, and the present state of the law offered a premium to unscrupulous builders to scamp their work. The clerk having shown that under the 137th by-law the Board had power to order the buildings to be pulled down on giving 14 days' notice, it was resolved, on the motion of the chairman (the Rev. A. R. Abbott) and Mr. Surr, to carry out the terms of the by-law, and this was carried unanimously. The surveyor remarked that it was a matter for deep regret that ground landlords and surveyors who would pass such buildings could not be proceeded against.

No Check on the Contractor. — A County Court Judge on the Relations of Architect and Builder.—At Burton-on-Trent County Court the case of Wm. Waterfield *v.* J. Adams was recently heard. Plaintiff is a builder at Swadlincote, and originally claimed £46 9s. 3d., but £19 4s. 6d. had been paid into court, and defendant disputed the remaining items on the grounds either that the work had not been done properly, or that the charges were exorbitant. The plaintiff, however, called Mr. Denny, architect, who stated that in his opinion the prices were fair and reasonable, and that the work had been done satisfactorily. The work, which consisted of alterations to buildings, was done by the day, and it was admitted that the plaintiffs themselves kept the time, and that there was no one to check it on behalf of the defendant. A number of letters were put in to show that the defendant had until recently promised to pay, and had not disputed the account. For the defence, Mr. Sidebottom, of Woodville, was called, and valued the work done at £39 4s. 6d. His Honour (Mr. W. F. Woodforde) remarked that defendant was evidently not a young man from the country, and had entered into an agreement with the plaintiff with his eyes open. He could not understand why the defendant should have written the letters which had been read in court if he intended afterwards to dispute the amount, and under the circumstances he did not see how he could strike out a single item. He might, however, say that it seemed a monstrous thing to him that no timekeeper should have been employed. He knew that architects and builders generally understood one another remarkably well, and that the more the builders had the more went into the architect's pocket. He should enter a verdict for the amount claimed, less the £19 4s. 6d. paid into court.

Silicate Paint. — On Monday, at Newport, Mon., county-court, Mr. J. M. Herbert, judge, gave judgment in the case of Hayward *v.* Batchelor, in which a claim was made for silicate paint supplied to defendant, who pleaded that it did not fulfil the representations of plaintiff. His honour said he had gone through the prospectus of the article supplied by plaintiff, and as he understood, the application of the petrifying liquid depended for its completeness on being put on a bare wall. Defendant's was an old rough-cast wall, on which there had been a thick coat of colouring matter. He could not doubt the defendant had failed to realise the advantage he was justified in anticipating, and that the failure was mainly due to the application of the petrifying liquid before the colouring matter had been removed. The colouring matter prevented the liquid from combining with the solid material of the wall. He held that the plaintiff made himself liable for the work done by the painter, by paying him for putting on the petrifying liquid, and without the express authority of the defendant; and after hearing the evidence he would not assess the amount due to the plaintiff at a higher sum than that which the defendant had paid into court. He must therefore give judgment for the defendant, but as there was a want of caution on the part of the defendant, he would only allow the defendant one witness, viz., Mr. Lawrence.

CHIPS.

A new reservoir is about to be constructed for the waterworks company of Ramsey, Isle of Man, some 200 yards above the two now in use. An embankment is to be formed across the glen 200ft. in extent, having a depth of wall of 45ft., and provision is made for filtering the supply. The plans have been prepared by Mr. F. Saunderson, and were approved at a recent meeting of shareholders.

The foundation-stone of a new Calvinistic Methodist chapel was laid on Friday week in Powell-street, Aberystwith. The chapel will be in the Lombardic style, and will seat 1,000 persons, at a cost of £4,000. Mr. Richard Owens, of Liverpool, is the architect, and Mr. James Williams, of Aberystwith, is the contractor.

The French Ministers of Public Works and Finance have issued circulars giving directions for the preparation of the relief map of France. The work will occupy ten years, and the cost is estimated at 19,000,000 francs, of which the departments will furnish 3,500,000 francs. The scale of the map has been fixed at 1 to 10,000, and the level of the roads and watercourses will first be depicted, the intervening spaces being afterwards filled in.

OUR LITHOGRAPHIC ILLUSTRATIONS.

COACH-HOUSE, ETC., BRIGHTON.

This building which we illustrate this week is for Alderman A. H Cox, J.P., Brighton, and to be erected in his private grounds. It combines coach-house, two-stall stable, summer-house, and "look-out." The coach-house is purposely kept low to preserve a view from the residence. The materials of construction are stone, concrete, red brick, and woodwork—teak, oak, and fir. The roofs to be covered with zinc or patent lead. Mr. Arthur Loader, of Brighton, &c., is the architect.

VILLAS ON THE STOW PARK ESTATE.

These villas, now nearly completed, occupy a fine site overlooking the Bristol Channel. The material for the walls and angle quoins is a hard, gritty, red stone, quarried on the estate, with freestone dressings to windows and doors. Bands of red Ruabon bricks are also introduced. The dining-room and kitchen offices occupy the front on the basement story, which from the nature of the site is entirely above ground. The roof is covered with Broseley red tiles, nailed and bedded in mortar, the high gales of the district greatly testing a roof of this kind. The tiles have a lap varying from 3 to 5 inches, and this work and the plastering has been carried out by Mr. S. Newick. The other contractors were—Plumbing and glazing, Mr. S. Hanse; Mr. J. Jenkins, masonry; and Mr. Coomer, the carpenters and joiners' work, all of Newport.

WESLEYAN THEOLOGICAL INSTITUTION, HANDSWORTH COLLEGE, BIRMINGHAM.

The design, illustrated this week, for a new college of the Wesleyan Theological Institution, by Messrs. Ball and Goddard, of Birmingham, was awarded the first premium in the competition by Mr. Alfred Waterhouse, the referee, and has been adopted by the committee for execution. The building is to be commenced at once. The college is to accommodate 70 students, all the studies being on the ground-floor, with corresponding dormitories over. The large lecture-room, the library, and the dining-hall are to be treated in a similar manner, each one story high, the ceilings coved and panelled in plaster, with wood ribs. The buildings are to be executed in red brick, with purple brick for diapers, buff terra-cotta for *all* dressings, and vertical tiles for the roofs. In the design the requirements of terra-cotta have been kept in view, so as to secure as much repetition of the same patterns as possible. The tower rooms are to be used for science class-rooms, and the upper part as an observatory, a clock being considered a wholly superfluous feature.

DESIGNS FOR A SMALL STABLE.—"BUILDING NEWS" DESIGNING CLUB.

Pressure upon our space prevented the publication of these designs earlier, as well as the critical review published in our present number of the row of cottage designs submitted by members a fortnight since. The sheet herewith includes an illustration of both the first and second designs for a small stable, the former being by "S. in a Circle," and the latter by "Motto J." The first design has undoubtedly the best plan, while the treatment of the elevation is suitable and good, though rather more commonplace perhaps than the second design, which, however, is rather too overdone in an endeavour after picturesque effect. The plans of the first floors we are unable to find room for, but their relative merits are about equal to those of the ground plans.

ST. THOMAS'S CHURCH, BRENTWOOD.

The church as shown in this week's issue is intended to replace the existing edifice erected some thirty years ago on the simplest principles of ecclesiastical design, which in its turn took the place of the chapel dedicated to St. Thomas of Canterbury, the only remaining portion of which is to be seen off the High-street in the mouldering fragments of a small 14th Century tower. The new church is intended to afford accommodation for some thousand worshippers. Its length internally will be 138ft., width 60ft., height to ceiling, which will be the same throughout, 55ft. The walls externally will be faced with flint, with Bath-stone dressings, internally the stonework will be red Dumfries. On the north side the existing chancel and choir aisles will be incorporated with the new work forming aisles to nave. It is proposed to erect only the east end in the first contract. Our view is taken from the south-west angle of the building, and a ground plan is given. Considerable skill has been shown in the way in which the existing divisions of the old chancel and aisles have been worked into the nave of the new building so as to preserve an equal division of parts for the clerestory windows and roof timbers on both sides of the church. On the south side the bays of the arcade are equally spaced, a clever niche-like feature between a sort of double pier being arranged next against the pulpit, where the necessary difference between the two sides of the church, in the matter of spacing, is skilfully overcome in a natural and simple way. The architect is Mr. Ernest C. Lee, of 15, Bedford-row, W.C.

A LEICESTER WAREHOUSE.

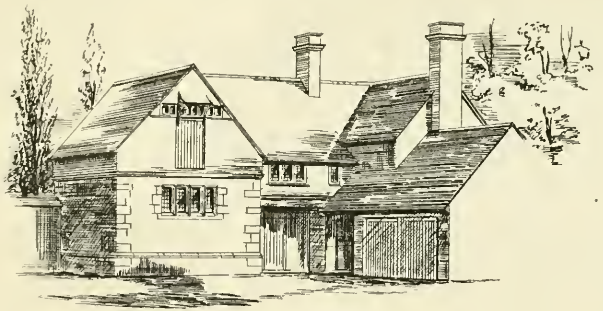
This illustration shows a proposed addition of two stories to the wholesale drug warehouse of Messrs. Richardson and Co., in the centre of the increasing town of Leicester. The architect is Mr. W. Millican, of Grey Friars, Leicester.

THE CITY OF LONDON SCHOOLS COMPETITION.

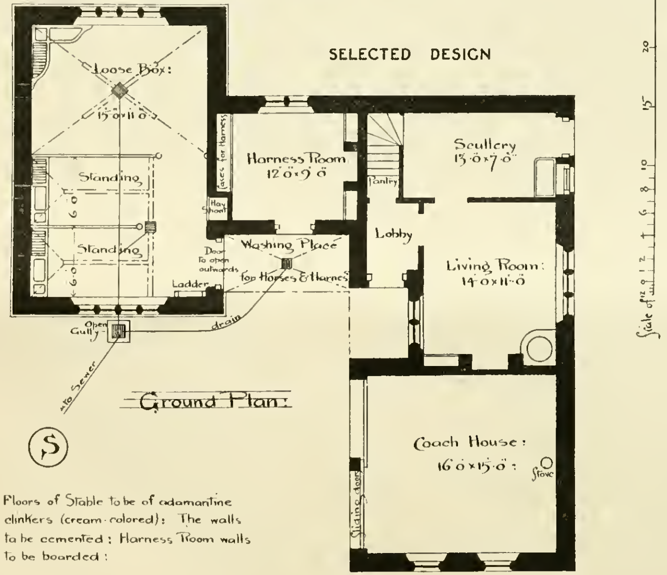
The Court of Common Council of the City of London held a special meeting on Friday last, at which the report of the schools' committee, submitting three designs for the proposed new buildings for schools on the Embankment, was formally presented. Mr. W. Hudson, a member, asked leave to present a petition from 31 of the architects, or firms of architects, of the 53 who had submitted designs for the school. This was allowed, after a division, by 73 votes against 67. The petition stated that the memorialists, in response to the invitation issued by the committee, had prepared and submitted designs for the new buildings; that while they had learnt with satisfaction that the committee had resolved to exhibit the various designs, with the consent of their respective authors, they desired the Court, in view of the number of the designs and their elaborate character, to direct that the exhibition, should at least remain open for 14 days, and that, considering the magnitude and importance of the proposed buildings and the expense incurred by the petitioners in preparing the designs, the Court would, in accordance with the custom adopted in similar cases and the suggestions of the Royal Institute of British Architects, refer the designs to some independent and eminent architect before a final decision was given. The memorialists were subjected to a searching ordeal of questions, in which, while they admitted they had agreed to abide by the published stipulations and rules of the competition, they yet urged that they did not suppose the decision would be left solely to laymen, and not to experienced and qualified architects. They declined to say whether, if successful, they would have petitioned the Court to have their designs approved by some professional authority, and they were not prepared to say that they ought to have made their claim to this effect before, and not after, the competition. At this stage a scene, which lasted fully an hour, occurred. Mr. William Lawley asked Mr. Robert Walker whether he really thought when he sent in his designs to the committee on the terms laid down, that they would be submitted to an expert, to which an affirmative reply was given. Mr. Lawley exclaimed that he did not believe it, and, being called to order, he withdrew the words, but said his belief continued the same. After an exciting debate the consideration of the report was adjourned, Mr. Lawley having apologised.

The report again came up for consideration yesterday (Thursday), when the competitors who signed the memorial were called to the bar, and Mr. Walker again answered numerous questions put by various members. He declined to state whether the committee had or had not, in the judgment of the competitors, selected the best designs for premiation, or to suggest the names of experts, one of whom might be asked to act as arbitrator. He did not consider Mr. Horace Jones, the City architect, whose design had been rejected by the court, should have been asked to report on the designs, and he understood that in point of fact he had declined to do so. The same objection would be felt by competitors to a report made by Mr. Murray, the City architect's chief assistant. Mr. Hudson then moved that the petition be received, and this was seconded. Mr. Felton, chairman of the Schools Committee, said this would be regarded by the committee as a vote of censure. On that committee was Sir Charles Reed, the chairman of the London School Board, and they had the constant advice and assistance of Dr. Abbott, head master of the schools. He contrasted the delay of months that had taken place in the present competition with the proceedings at the last competition in 1835. Then the court invited designs for the rebuilding of the City school in Milk-street; thirty designs were sent in on the 30th April. On the 1st May these were reduced in committee to twenty, and on the 2nd May the final selection of designs was made. It was true that the result was unsatisfactory, but the present delay had given occasion for all manner of anonymous attacks and lampoons only worthy of the age of Swift, and with all his virulence without his wit. The competitors had appeared unwilling to accept the report on which the committee had been advised by Mr. Murray; but members ought to know that only a fortnight since the Court adopted without discussion the plans prepared by Mr. Murray for the fruit markets, estimated to involve an expenditure of £115,000, whereas the whole outlay on the schools was not to exceed £51,000. It was unavoidable that of the 53 competitors, 52 must be disappointed, and all the friends and acquaintances of these 52 men and many of their clients would naturally share in that feeling, and he urged the Court to disregard these expressions of chagrin, and support their own committee. The motion for the reception of the memorial was then put and lost by an overwhelming majority, amidst loud applause, only six hands being upheld in its favour in a court of over 120 members.

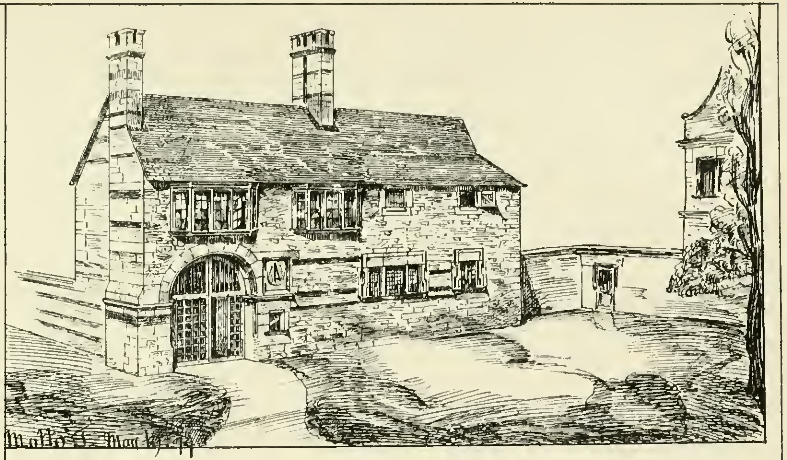
The adoption of the report having been formally moved, Mr. James Edmeston moved, as an amendment, that all the designs sent in be submitted under numbers to the President of the Royal Institute of British Architects, who should report thereon, distinguishing in order of merit the three in which the committee's instructions would be most efficiently carried out. He explained that he gave notice of this motion before the meeting of competitors at Cannon-street Hotel, and that, except the names of the three successful architects, which he saw published in the Building News, he did not at that time know the name of a single competitor It was a fact that after the committee made their selection, and it had been made known, they came to the conclusion that their decision was incorrect, and held another meeting at which the same competitors were recommended for prizes, but those placed second and third were transposed. This threw doubt on the whole report, for it was possible that some one of the remaning fifty designs was better than either of those as to the relative merits of which they had changed their minds, and he therefore asked the Court to adopt his amendment for the sake of the Corporation, who were going to spend a large sum of money, and wished to have more satisfactory buildings than resulted from the hasty decision arrived at on the last occasion; in the interests of the public and those whose sons would be educated in these buildings; but chiefly in common justice to the competitors who had, in confidence in the fairness of the committee, expended collectively some £5,000 or £6,000, for which £300 would be given, and who had a right to ask that the best advice should be obtained to guide the Court to a fair decision. The amendment was not seconded. Objection was raised to the proposal to cover the mottoes of the plans, as any architect appointed arbitrator, it was remarked by a member, after the publication of the first premiated block plan in the Building News and its full criticisms, which must have been supplied by competitors, would have no difficulty in distinguishing the authorships. Several members took exception to the terms of the resolution before the Court in which the report was proposed to be adopted, and the committee were authorised to carry into execution the design to which the first premium was awarded. Mr. Felton said that if the lowest tender should be from £5,000 to £10,000 above the architects' estimate, they would apply to the Court for further instructions; eventually he agreed to a modification of the resolution, only authorising the committee to procure tenders. Mr. Beck criticised the plans which had obtained the first prize in detail, but the resolution for adopting the report, after further heated protests, was put from the chair and carried *nem. con.*



SELECTED DESIGN

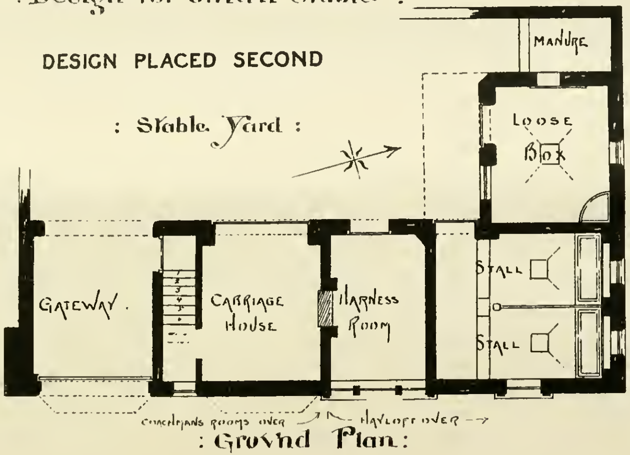


Floors of Stable to be of adamantine clinkers (cream-colored): The walls to be cemented: Harness Room walls to be boarded:



: Design for small Stable. :

DESIGN PLACED SECOND



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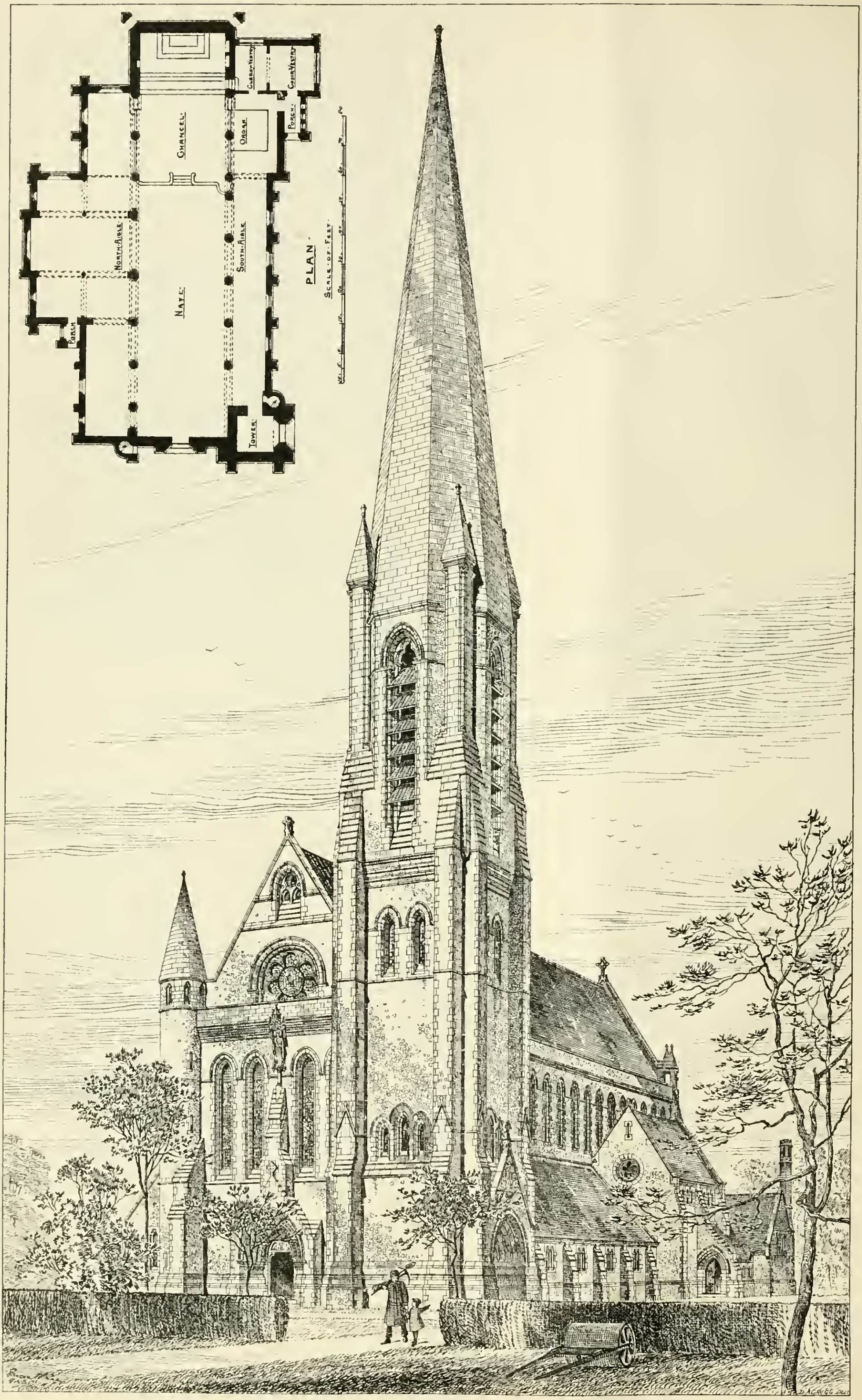
"BUILDING NEWS" DESIGNING CLUB



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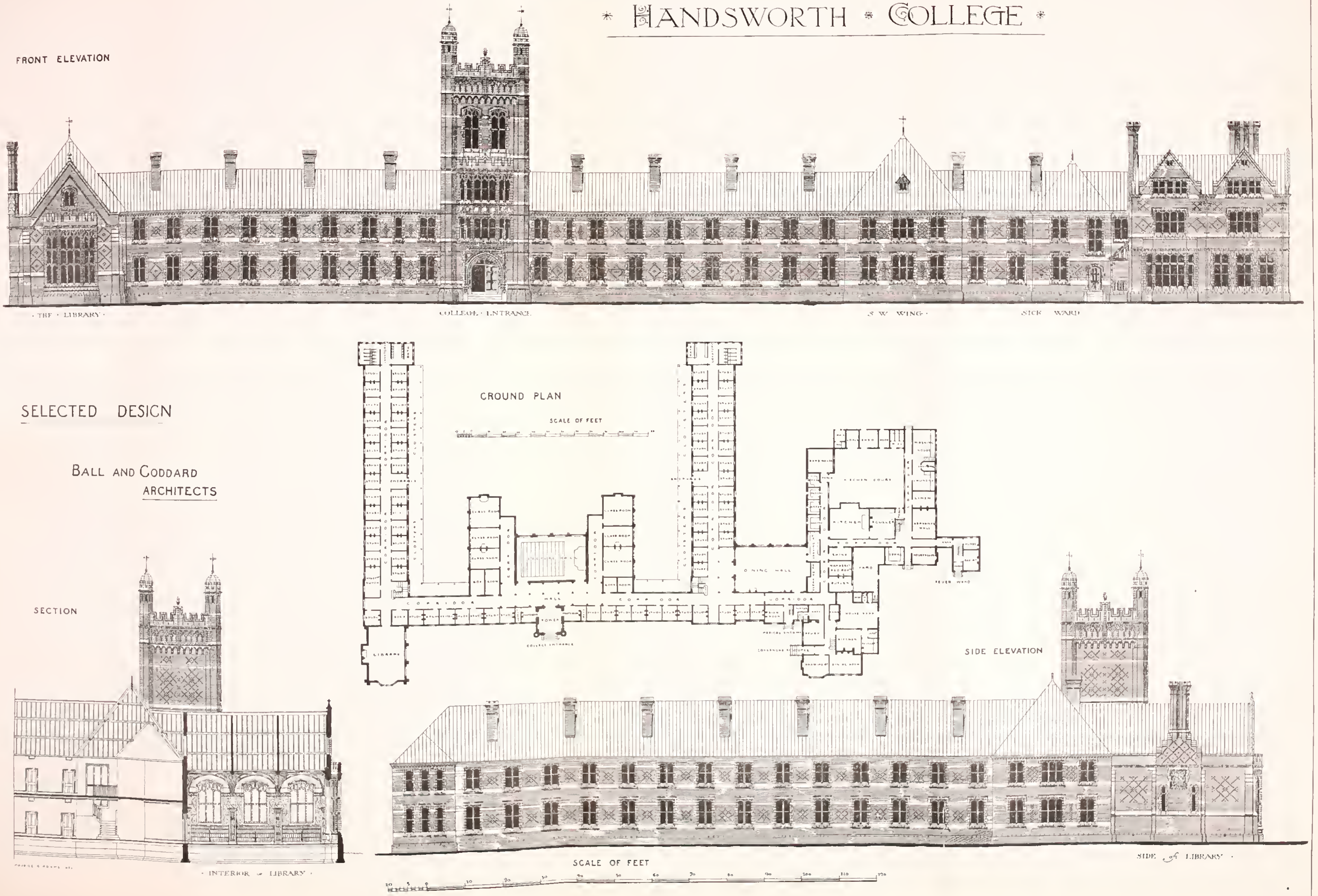
CHURCH OF S. THOMAS, BRENTWOOD

WESLEYAN THEOLOGICAL INSTITUTION

HANDSWORTH COLLEGE

SELECTED DESIGN

BALL AND GODDARD
ARCHITECTS



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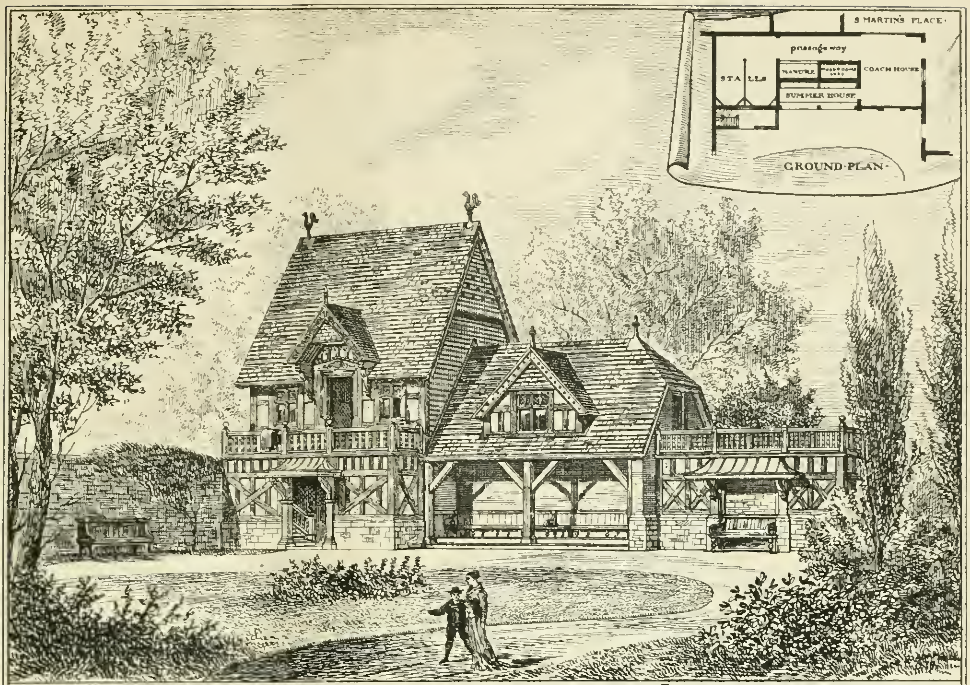
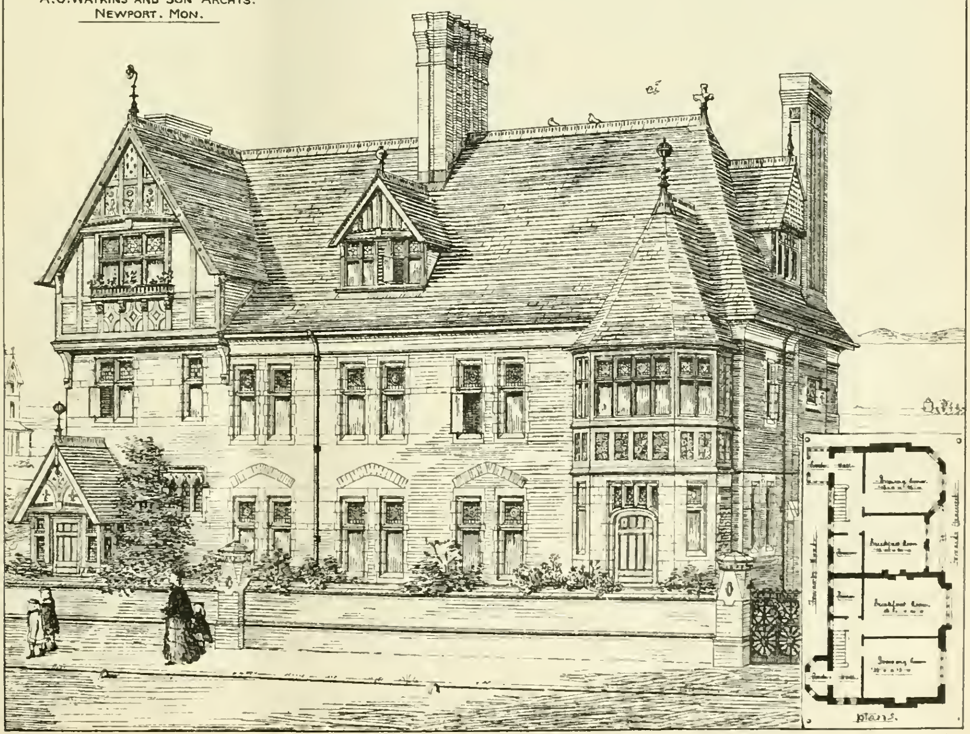


COACH·HOUSE·STABLES·AND·SUMMER·HOUSE·BRIGHTON·FOR·ALDN. COX·J·P· ARTHUR·LOADER·ARCHT.

STOW PARK ESTATE
pair of Villas for John Mason Esq:

A. O. WATKINS AND SON ARCHTS.
NEWPORT. MON.



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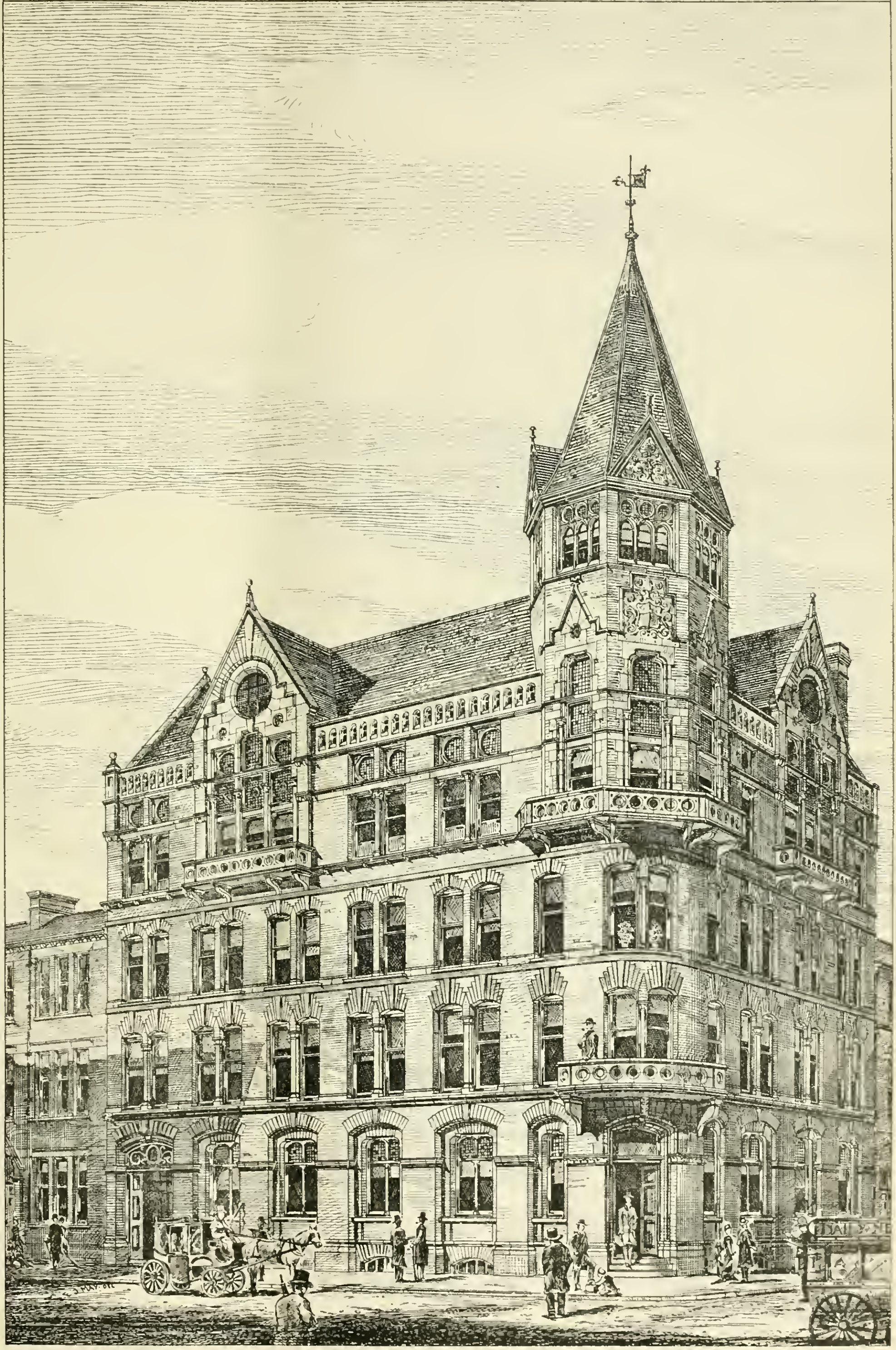
A·Leicester·Warehouse: W·Millican·F·R·I·B·A· Architect



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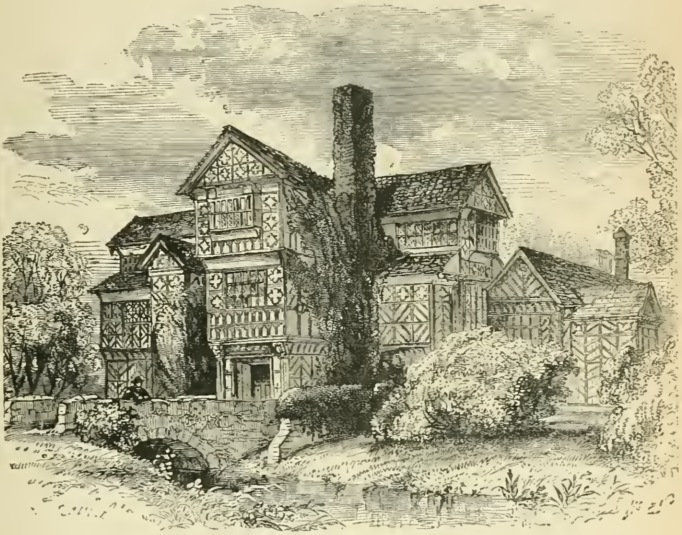
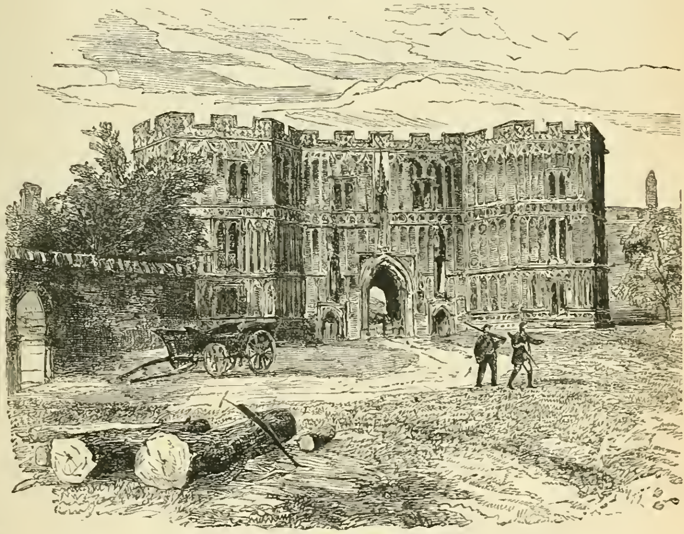
PLEASANT DAYS IN PLEASANT PLACES.*

Under this happy title Mr. Walford, the well-known author of "The County Families" and similar works, has republished as one of Bogue's Half Hour Series of books a number of topographical sketches originally contributed to *All the Year Round* between the years 1862 and 1868. Nearly a score picturesque castles, abbeys, and old-world country towns, mostly within easy distance of London, are described in the easy and entertaining manner which might be expected of the writer who has completed the late Walter Thornbury's "Old and New London" for Messrs. Cassell. Very little fresh information is imparted as to the architectural features of the buildings visited by the author, beyond what may be found in any guide-book, but although Mr. Walford has not displayed a very keen discrimination of the salient points of the buildings visited, and does not seem to have closely observed their details, the dates and names, generally a weak point in such papers, appear to have been collated with some pains, and are, so far as we have tested them, accurately printed. As may be supposed, the references to further restorations needed in churches are occasionally out of date, additional works having been carried out since the papers were written, to which no allusion is made. This is notably the case at the great parish church of St. Nicholas, Yarmouth. The volume is illustrated by numerous woodcuts, which, where they deal with the general mass, are considerably above the average, but, as usual, fail hopelessly in detail. An instance of this weakness is the full-page drawing of Winchilsea Church, taken from S.E , where the unique transom, which cuts completely across the tracery of the Decorated east window in the chancel, is scarcely—and that incorrectly—indicated. An excellent illustration of this has appeared in the Architectural Association Sketchbook; and in the Building News for September 6, last year, was published a view of the church, sketched by Mr. A.W. Cross from nearly the same point as Mr. Walford's artist has selected, and a comparison of these drawings may be interesting. We reproduce, by permission, two of the illustrations in the book before us—those of Moreton Old Hall, Cheshire, and the gateway at the entrance to St. Osyth's Priory, Essex. Of the former, one of the most frequently sketched half-timbered mansions in England, Mr. Walford says that—

> "It dates from the 15th century, but it marks the site of an older mansion, of which some faint traces remain. It stands on the road leading from Congleton towards Newcastle, amidst a sandy plain looking towards the borders of Staffordshire, and is approached by a small stone bridge over a moat which encloses about a statute acre of ground, but of the entire building three sides only are now standing. According to Lysons, the hall belonged at an early period to the noble and knightly family of Moreton, whose heiress about the reign of Henry III. married Gralam de Lostock. His son took the name of Moreton from his property, and was the grandfather of Gralam de Moreton, who was living 1354. The descendants of this personage continued possessed of this hall in strict male descent till the death of Sir Walter Moreton, Recorder of London, a little more than a century ago, who, in 1763, bequeathed the estate to the Rev. Richard Taylor, rector of West Firle, Sussex, who assumed the name of Moreton, and was the father of the late owner, the Rev. William Moreton Moreton. The seat and property now belong to this gentleman's daughter and heiress. Entering over the bridge from the south side, we find ourselves at the portal of a very ancient gateway, which admits us into the court. The buildings over this gateway are very lofty, and were probably used as sleeping rooms, except the long gallery above and a room on the south side opening into it. The sides of the gallery are almost entirely composed of a series of bay windows; the roof is of oak resting on brackets and formed into square compartments filled with quatrefoils. Scattered about over the ceiling of the hall and large parlour are inscriptions, stating that the windows were made by William Moreton, MDLIX., together with the arms and crest of Moreton. Over the window at the west end is a figure of Fortune, resting on a wheel, with the motto 'Qui modo scandit corruet statim,' and at the other end is another figure, with a globe and the inscription 'The Speare of Destiny, whose rule is Knowledge.' The bow windows of the hall and the adjoining apartment, according to Ormerod, appear to have been added at a later date. The most ancient side of the house is undoubtedly the eastern. In this is a small and very curious chapel, divided into the regular form of chapel and ante-chapel by a wooden screen. The extreme length of the apartment is about 30ft., the ceiling is very low; the chapel proper is about 12ft. by 9ft.; the rest of the space is occupied by the ante-chapel. At the east end is a pointed window, and texts of Scripture—not from the authorised English version—are painted in black letter within compartments on the walls. The old chapel is not so carefully preserved as it deserves to be; the texts from the Bible are now scarcely visible. The old glass patterns in the windows of the house are of exquisite shapes and forms. As the house wanted repairing in one of the large beams which supported the projecting upper gable as far back as Elizabeth's time, we cannot be far wrong in believing that the edifice dates from the reign of Henry VII. or Henry VIII., more especially as it is well known that these moated houses, adorned with black and white diapers of timbers and plaster, succeeded the ancient castellated residences, and in their turn gave way to Tudor and Elizabethan mansions."



MORETON OLD HALL.



GATEWAY OF ST. OSYTH'S PRIORY.

The history of St. Osyth's Priory, and the strange legend of the young nun martyred on its site, are narrated by the author, who justly condemns the incongruity and want of taste characterising the modern additions to the monastic buildings. The gateway, which we illustrate, is described as "a very handsome and imposing structure, three stories in height and battlemented, and as perfect now as the day when it was first erected. It is of hewn stone, mixed with flint, having two towers and two posterns. On the south and west sides of the spacious quadrangle into which it leads are stables and offices of more than ordinary extent, and bearing signs of great antiquity." We observe that Mr. Walford refers to the small gateway at right angles to and on the west of this large one as Norman; whereas, as we recollect hearing Mr. J. H. Parker demonstrate *in loco* some years since, although it is round-headed, the mouldings are unmistakably those of the Early English period. The compiler of Murray's "Handbook to the Eastern Counties," by the way, has blundered more egregiously, for he stupidly designates the whole gatehouse, in spite of the evidence of panelled tracery, square-headed hoods to entrances and battlements, as "apparently part of the bishop's [De Belmes, of London, *ante* 1118] Late Norman work." We note also, that on p. 115, Mr. Walford unhesitatingly asserts Maldon to have been the Camalodunum mentioned by Tacitus, whereas it seems to be generally agreed by archæologists that the claims of Colchester to be the successor of that Roman camp and colony are established by the altar and coins deposited in the museum of that borough, as well as by its topography. But this suggests a controversy which it is scarcely wise to re-stir. The chapter on Shoreham and Bramber is scarcely complete without a passing allusion to the church with its interesting brasses, adjoining Wiston House, which latter is described in general terms. It would have been a graceful act to have referred to the late Mark Antony Lower, of Lewes, who did much to popularise the archæology of Sussex.

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* Pleasant Days in Pleasant Places. By Edward Walford, M.A. London: D. Bogue, 3, St. Martin's-place, Trafalgar-square.

In similar style to the passages we have quoted, Mr. Walford chats about the almost deserted city of St. David's, Burnham Beeches, the Hadleighs Suffolk and Essex, Ightham and Kenilworth, and other holiday resorts. The book is nicely got up and well timed, and will be acceptable to many of those who make similar rambles.

CHIPS.

The present session of St. Paul's Ecclesiological Society will be brought to a close to-morrow (Saturday), after paying a visit to the Abbey Church of Waltham Holy Cross. Mr. William Burges, who it will be remembered restored the church some years since, will conduct the party over the building.

Last week Major-General Hutchinson, the Government inspector, proceeded on an inspection of a portion of the new line of railway from King's Lynn to Fakenham, the first section of which, to Little Massingham, is to be opened forthwith. The line passes through the heart of a large agricultural district, now for the first time brought into immediate connection with all the railway systems of Great Britain. Mr. W. Smith was the engineer, and Messrs. Wilkinson and Jarvis the contractors. The length of the line inspected is fourteen miles.

The Ipswich Town Council, at their meeting last week, ordered the common seal to be affixed to the several purchase contracts, amounting to £12,050, of the properties at the rear of the town hall for the proposed new corn exchange, thus definitely binding themselves to the scheme for which a competition for designs is now open. At the same meeting the tender of Messrs. Pearson and Sons, of Bradford, amounting to £43,500, was accepted for the execution of a scheme of sewerage for the town.

The new chancel of the Episcopal church of St. Margaret, Aberlour, erected as a memorial to the late Mr. Grant, of Wester Elchies, is nearly completed. It is paved with tiles by Messrs. Minton and Co., of Stoke-on-Trent; the chancel screen is of open metal-work, and is being made by Messrs. Jones and Willis, of London. The altar, reredos, and sedilia are being executed by Messrs. Dawson, of Glasgow; the materials for these are Caen stone and rich green marble. An organ has just been erected in the transept by Messrs. Harrison and Harrison, of London, and was opened on Sunday last. It has been erected in remembrance of Mrs. Macpherson Grant.

Building Intelligence.

Armadale, N.B.—A new public school and teacher's house has just been completed for the Bathgate Landward School Board. Accommodation has been provided for about 460. The plan is on the principle of the letter T, for a mixed school, with senior, junior, and infant divisions, and separate class-rooms to each division. The total cost has been upwards of £4,000. Mr. James Fairley, of Edinburgh, is the architect of the work.

Bishop-Monkton. — On Tuesday, the new Church of St. John the Baptist, Bishop-Monkton, near Ripon, was opened. The church has been built in the place of a small, mean edifice erected in 1822, and which took the place of the old parish church, or rather chapel, in the parish of Ripon. The new church, which is built slightly more to the north than the one it has replaced, is in the Early English style, and consists of a chancel, 27ft. by 17ft., with organ chamber and vestry on its north side; a nave, 58ft. 6in. by 21ft. 6in.; and a north porch, forming the lower stage of a tower and spire. The floor is of stone and tiles, increasing in richness to the east. The altar is quite plain and of solid oak, and stands in front of a stone retable on which is a carved and panelled reredos. The total height of the spire is 74ft. The whole of the works have been carried out at an expense of about £2,700 by Mr. S. B. Burton, of Newcastle-upon-Tyne, from the designs and under the supervision of Mr. C. Hodgson Fowler, F.S.A., of Durham.

Bristol.—The new church of St. Werburgh, Bristol, will be ready for opening in about two months. The church has been built from designs furnished by Mr. J. Bevan, of Bristol. The floor of the building, as far as the old portion is concerned, is exactly the same, but the sweep of the nave is now 78ft., 17ft. longer than originally. The total width is as before, 59ft. between the walls. The plan of the church comprises nave, north and south aisles, tower, western porch, organ chamber, chancel, and vestry on the south side. The nave is lengthened by an additional bay, the total length of the church being further increased by a chancel, which there was not in the old structure. The chancel is 20ft. wide and 25ft. long, and the organ chamber on the south side of the chancel is 15ft. by 17ft. The vestry on the north side being 17ft. by 12ft. The style of architecture is of the Perpendicular period, but the outside walls are modern. Mr. B. Gay, of Stanley-street, Easton-road, Bristol, has done the glazing, and great credit is due to him for the manner in which he has carried out the work. The edifice is built of freestone externally, covered with Broseley tiles. The roof in the old building was of plaster—the present one is of pitch-pine, varnished, and Mr. Bevan has provided for ventilation by having the roof perforated all along the nave. Provision is made for 650 persons, a much larger number than the old church would seat. The corona lights are supplied by Messrs. Jones and Willis, of Birmingham. The general contractors are Messrs. Wilkins and Son. We understand that the designs of Mr. Bevan have also been accepted for St. Saviour's Church, Woolcot Park, Redland, about to be erected. There was a limited competition among architects of Bristol, and Mr. Benjamin Ferrey, F.S.A., London, was the adjudicator.

Corstorphine.—A pavilion has been erected on the new cricket-ground of the Edinburgh University Club at Corstorphine. The students have for long felt the want of such accommodation, and they are now indebted to Sir Alexander Grant, Principal, many of the professors of the university, and others, for organising and carrying out the scheme by means of which this excellent ground, beautifully situated, within easy access from Edinburgh, has been made available for their recreation. Besides the ordinary accommodation for the members of the Club, the building includes a dwelling-house for the permanent residence of a professional. The work has been carried out under Mr. James Fairley, Architect, Edinburgh.

Croft.—On Thursday, the 17th instant, the parish church of St. Michael's, at Croft, was reopened. The old church was a miserable structure, and it was therefore resolved to rebuild the whole, with the exception of the tower. The new church consists of a nave and chancel, and north and south transept, a porch on the south side, and an organ-chamber and vestry on the north side of the chancel. The style adopted is that of the latter part of the 14th century. The walls are built of local granite with Attleborough and Bath stone dressings. The walls of the chancel inside are lined with the same in alternate bands. The chancel arch has carved capitals, and detached shafts of red Mansfield stone. The pulpit is carved oak with a stone base. The altar is oak with traceried panels to front and ends. The font is a remarkable one. The bowl is the old font which was found in the church, and is of a very early date. In the old north wall there was discovered a very small old Norman window. This has been restored, and refixed in the north transept. The work has been carried out by Messrs. Law and King, builders, Lutterworth, under the direction of the architect, Mr. William Smith, of John-street, Adelphi, London.

Croydon.—On Saturday the memorial-stone of the new High School for girls, about to be erected in Wellesley-road, Croydon, was laid by the Archbishop of Canterbury. The site of the building has an area of about three quarters of an acre, the frontage being 176ft., and the depth 222ft., of which the buildings will occupy 126ft. by 54ft., leaving ample space for a playground. As a portion of the site had been used as a gravel pit, it was necessary, in parts, to take the foundations to a considerable depth; in doing this, every particle of made earth has been removed from the area of the buildings, and clean fresh gravel filled in instead. Partly owing to this, and partly on the score of expense, the lowest floor has been kept about 4ft. below the level of the road. To obviate dampness, there will be an asphalted pathway 4ft. wide round the building, sloping from it towards a channel, which will be met by a turfed slope of easy gradient, starting about 16ft. from the buildings. There are no class-rooms at this lowest level, which is 10ft. high, it being divided into cloak and dressing-rooms, lavatories, music-rooms, a luncheon-room, kitchen, and offices, a spare room, &c. The next story has a height of 12ft., and contains four class-rooms, each 24ft. by 20ft., one 29ft. by 20ft., and one 19ft. by 20ft.; there is also an office for the head mistress, with a waiting-room adjoining. The chief entrance is on this floor and it is in the porch that the Archbishop laid the memorial-stone last Saturday. At each end of a 9ft. corridor are staircases (10ft. wide), giving access to the floor above, on which is the assembly room 60ft. by 30ft., with a gallery at one end, and 22ft high, with a panelled and moulded ceiling. On this floor there will be two class-rooms, 24ft. by 20ft. one 29ft. by 20ft., and one 19ft. by 20ft., each having a height of 12ft. Included in the buildings are a studio with north top light, a residence of five rooms for the head mistress, and servants' rooms. The materials are red brick and pale buff terra-cotta with brown tiles on the roofs. When completed the school will accommodate 300 pupils. The architect is Mr. Charles Henman, the contractor Mr. Wm. Marringe, and the clerk of works, Mr. J. A. Clark. The contract has been taken at £7,150.

Exeter.—The Victoria-hall was reopened on Monday, after rearrangement and internal decoration, under the superintendence of a sub-committee of the directors. The panels of the ceiling are tinted sky-blue, with a double line vermilion border, and the principals and other woodwork are stained a dark-oak tint. In the alcove of the orchestra is represented a sky flecked with cumulous clouds. The walls between the pilasters are panelled and styled in monochromatic tints with lined borders and corners, and in the centre of these panels is the principal mural decoration, namely, a series of fourteen Devonshire landscapes, by Mr. Widgery, a local artist. These comprise illustrations of some of the choicest bits of moorland and coast scenery in the county, and are executed in a free and bold style. The subjects are: Old tower and quay at Lynmouth; Leigh Woods, Bridestowe, a study of beech-trees; Fall on the Lyd; Castle Rock, Lynton; Sharptor Rock, Drewsteignton; Kit's Fall, another bit from the Lyd; Gorge on the Lyd, near Lydford Bridge; Lydford Bridge itself; Sunset on the Coast, near Ilfracombe; Fingle Bridge, Drewsteignton, a favourite resort for picnics; Vixen Tor, near Merivale Bridge; Dartmoor, another sunset scene in the neighbourhood of Ilfracombe; and Holy-street Mill, Chagford. These pictures are ovals, 9ft. 6in. by 4ft. 6in. Over the balcony has been placed a landscape measuring 36ft. by 20ft., and giving a view of the valley of the Exe from Woodbury common. The lighting of the hall has been improved by night and day by additional double-branch burners from the corbels, and by piercing dormer lights in the roofs. Dressing-rooms have been formed under the orchestra, and a passage constructed behind the stage. The general decorative work has been carried out by Mr. John Algar, of Gandy-street, Exeter.

Glasnevin.—On Monday afternoon the Most Rev. Dr. M'Cabe, Archbishop of Dublin, opened the new wing which completes the design of the St. Vincent de Paul Male Orphanage at Glasnevin. This wing will accommodate fifty additional orphans, and necessarily follows the architectural style of the design it completes. The walling is of punched limestone with chiselled granite quoins and dressings. On the ground-floor are waiting-rooms, and a refectory 50ft. by 21ft.; on the first-floor accommodation for the Christian brothers; and on the second-floor a dormitory 50ft. by 29ft., with lavatories and bedrooms. There is a central staircase of Dalkey granite. At the same time the infirmary has been enlarged and the sewerage rearranged. The architect was Mr. John L. Robinson, Great Brunswick-street, Dublin, and Messrs. Meade, of Dublin, were the contractors. The outlay has been over £3,500.

Gresford.—A new Wesleyan chapel has been opened at Gresford. The building, which is cruciform in plan, is in the Early English style, and the material used is the freestone of the neighbourhood, black-pointed, covered with a high-pitched roof of Penrhyn slates, surmounted with ornamental blue ridge crests, and finials of wrought iron. The interior of the chapel consists of a nave of 38 feet long by 20 feet wide, transept 42 feet by 20 feet, and a chancel 15 feet by 13 feet, in addition to the vestry. The seats, which will accommodate in all 400 persons, are of pitch-pine. The architect of the building is Mr. A. C. Baugh, of Wrexham, who gratuitously prepared the plans and gave his services, and the builder is Mr. William Rogers, of Rossett. The total cost has been about £1,500.

Hastings.—New ladies' baths were opened at White Rock, Hastings, on Monday week by Mrs. Thos. Brassey. They are more elaborately fitted up than the gentlemen's baths previously opened at the same place, although not so large. The dimensions of the principal bath are 90ft. by 40ft., and the depth of water varies by regular gradations from 7ft. 6in. to 3ft. 1in. At the east end of the building is a children's bath, 2ft. deep. The whole fabric is of concrete, including the lining to the bath. There are two tiers of dressing-boxes, the upper one forming a gallery round the bath. They are formed of woodwork, stained to imitate oak, and are Gothic in style. There are thirty-four boxes, each 6ft. by 5ft., in each tier. Iron columns support the heavy iron girders on which the roof of concrete rests. There is a spring board at the deep end of the bath, and behind this an audience gallery, communicating with the waiting-room. With regard to the watersupply, new arrangements are being completed. Hitherto the water has been taken direct from the sea and allowed to settle in the baths. Two large settling tanks have just been finished and occupy the space beneath the proposed two large staircases; the supply from these to the baths will be continuous. When the entire scheme is carried out the centre of the establishment will be occupied by the working department, containing washing apparatus, drying-rooms, engine, and plant, and from here the water will be distributed to the baths. Private baths will be erected on each side of the grand entrances, and there will also be refreshment bars, shampooing-rooms, and lavatories, and between the entrances a reading-room, billiard-room, and Turkish baths. The total area inclosed measures 650ft. by 80ft. Messrs. Cross, Skiller, and Jeffrey are the architects, Mr. Hanson the engineer, and Mr. Dillon has acted as clerk of works.

Horsforth.—A new Mechanics' Institute is about to be erected at Horsforth (between Leeds and Bradford). The building will contain, in the basement, four class-rooms, two retiring rooms in connection with the large hall, storage-room, and heating apparatus. On the ground-floor the following are arranged: Conversation-room 24ft. by 16ft., a reading-room and library 28ft. by 16ft., class-room 19½ft. by 16ft., a committee-room 16ft. by 13ft., and large hall 70ft. by 42ft. On the first-floor is a lecture-room 42ft. by 24ft., and two class-rooms. On the second-floor a residence for the curator is arranged. The site has been given by W. S. Stanhope, Esq., M.P. The cost is estimated at £4,000 to £4,500. The style is a sort of Free Classic, of simple character, in stone. Messrs. Milnes and France, of Bradford, are the architects.

Incorporated Church Building Society.—The incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its last meeting for the present session, at 7, Whitehall, last week. Grants of money were made in aid of building new churches at Penrhyncoch, St. John, in the parish of Llanbadarn, Fawr, near Aberystwith, £100; Rowbarton, St. James, near Taunton, £200; and Steeton, in the parish of Kildwick, near Leeds, £120. Rebuilding the churches at Plymouth St. Peter, Devon £400; and Sheepwash, St. Lawrence, near Highampton, Devon, £100. Enlarging or otherwise improving the accommodation in the churches at Badingham, St. John, near Framlingham, Suffolk, £15; Colchester, St. Paul, Essex, £30; Crawley, St. John, Sussex, £40; Hungerford, St. Lawrence, Berks, £40; Knockholt, St. Katherine, near Sevenoaks, Kent, £50; Llangwm, St. Hierom, near Haverfordwest, £35; Llanwnda, near Fishguard, Pembroke, £25; South Bersted, near Bognor, Sussex, £50; Higham-Gobion, near Ampthill, Beds, £15; St. Mary's Hill, St. Mary, near Bridgend, Glamorgan, £25; Thurning, St. James, near Oundle, Hunts, £40; Tywardreath, St. Andrew, near Par Station, Cornwall, £60; and Winthorpe, St. Mary, near Burgh, Lincoln, £40. Under urgent circumstances the following grants formerly made were increased:—Towards building the church at Carnhedren, near St. David's, from £100 to £120; rebuilding on a new site the church at Upton-on-Severn, near Worcester, from £200 to £210; and towards enlarging Christ Church, Eastbourne, Sussex, from £50 to £65. Grants were also made from the Special Mission Buildings Fund towards building school or mission churches at Fishergate, in the parish of Southwick, near Shoreham, Sussex, £10; Llandinorwic, in the parish of Llanddeiniolen, near Carnarvon, £20; Portsea, St. Mary, iron church, £15: Portsea, St. Mary mission building, £15; and Spon-lane, in the parish of St. John's, Bromwich, £15.

Kingsley.—At the church of St. John the Evangelist, Kingsley, Cheshire, a new reredos has been erected, and dedication services held on Wednesday and Sunday last. It has cost about £200, and is made of Runcorn stone of a very fine quality, with panels of alabaster. The style is Early Decorated, and behind the super-altar, which finishes with a polished alabaster shelf, is an arcade of five bays, supported on clusters of polished red and green marble shafts and carved caps. The central panel is a pure white statuary cross on a ground of coloured alabaster, diapered and slightly gilt; in the other four bays are carved the emblems of the Evangelists. The arcade terminates with a moulded cornice, but is broken in the centre by a crocketed canopy. On either side are zinc tablets, gilt and inscribed with the Commandments under Howth trefoil heads. The reredos has been designed by Mr. Douglas, architect, of Chester; and has been carried out by Mr. John A. Hanley, sculptor, of the same city.

Mount Stuart.—The destruction by fire, some two years ago, of Lord Bute's mansion of Mount Stuart afforded an opportunity for rebuilding the same. In designing the new house, Mr. R. Anderson, A.R.S.A., proposes to place upon the same site a pile of buildings 120 feet square. The main entrance, approached through a handsome carriage-porch, is placed at a corner of the block. Immediately within the doorway is an outer lobby, some 22 feet square, from which a short flight of steps leads, through folding doors, to an inner lobby, to the right of which a large arched doorway opens upon the great central hall of the mansion. Measuring 60 feet square from wall to wall, and 33 feet square within the arcade, which is carried round all four sides, this superb hall rises, above the top of the first floor, into a square tower, with roof of groined vaulting and three pointed windows in each side to give light to the interior. The lower arcade has large pointed arches, the roof of the passage which runs round, between pillars and wall, being formed of groined stonework. Over this vaulting is a corridor looking out upon the hall through a second arcade, whose arched openings, smaller than those of the lower tier, are arranged in pairs. The corridor gives access to the principal bedrooms and other apartments occupying the first floor; itself being reached by a staircase rising from the inner end of the hall. The architectural details are carried out in the Early Decorated style. The architect has resolved to adopt the system of double walls, with a vacant space between. There will accordingly be an outside wall of reddish freestone, and within this, at the distance of a foot, an inner wall of brick, which will carry the beams supporting the floors on projecting stone corbels.

The Severn Bridge Railway Approaches.—Contemporaneously with the near approach to completion of the Severn Railway Bridge, the contractor for the railways proper and viaduct, Mr. Griffith Griffiths, has made, notwithstanding the unfavourable weather, corresponding progress, and in the course of a few weeks the work undertaken by him on either side of the Severn will practically be finished. The masonry viaduct on the Forest side of the river has so far advanced that the coping was commenced last week. Upon the crown of the arches has been commenced the putting in of concrete, on which felt will be laid to prevent percolation of water, and so to insure the preservation of the viaduct; the permanent way will rest upon this felt decking. In immediate proximity to the viaduct—approached by a side path of rather sharp gradient—is the railway station and signal-box, the platforms for the former are in course of being laid down. On the Forest shore the contractor's work is now brought within narrow limits, and with weather at all favourable, the whole of it can be completed by the early part of August. In constructing the line from the Berkeley shore of the bridge a considerable amount of excavation was involved, upwards of 108,000 yards of earth having to be removed. The permanent way is actually laid upon the greater portion of the railway on this side of the Severn, as well as on the Forest portion to the bridge from Lydney, extending also nearly to the junction with the Midland line at Sharpness, and to the docks and canal where will be the coal tips. The latter will be constructed in the old Sharpness house. It is intended that the railway station at Sharpness shall serve both the Severn bridge and the Midland traffic, and the building and offices are nearly finished. The walling is of brick, smooth faced, and manufactured by Mr. Griffiths, the contractor for the line at the Forest works. Two new hotels are also in course of completion at Sharpness, in nearer proximity to the docks than the existing ones.

CHIPS.

A new bridge is approaching completion over the Lee, in county Cork, under the superintendence of Mr. Nathaniel Jackson, one of the county surveyors. It is being constructed of concrete.

A special convocation was held at Bishop's Court, in the Isle of Man, in reference to the Dilapidations Act on Thursday, the 17th inst., when Mr. James Cowell, architect and builder, was appointed diocesan surveyor for Sodor and Man.

At a meeting of the Sarsfield Memorial Committee, held at Limerick on Friday, it was reported that £803 had been subscribed, and it was thereupon decided that a sub-committee be appointed to select a site, and enter into communication with artists for a pedestrian statue. An amendment proposing that the statue be an equestrian one, and that efforts be made with this object to raise £3,000, was defeated.

The construction of the proposed new lines of tramways through Southwark and Deptford are to be commenced immediately the formal sanction of the Board of Trade and of the vestry of Bermondsey have been granted. Mr. Dickson is the engineer.

At a meeting held in the Jerusalem Chamber, Westminster Abbey, on Monday, it was resolved to open a subscription in order to erect a statue to the memory of Lord Lawrence in a public place in London.

The grand portal of Strasbourg Cathedral, according to the Paris papers, is at last finished. The two doors of bronze consists of 1,500 pieces, 650 ornamental-headed nails, 300 rosettes, 98 large lozenge-shaped plates, 14 figure scenes, 14 half-lozenges with animals, 181 lozenges, with plants, and foliage, and so forth. The subjects are all from sacred history.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Rus. (1. W. Stanley, Great Turnstile. 2. Pitman, Paternoster-row.)

Our Commonplace Column.—W. J and Others. (We shall publish a column probably next week. Notes and quotations on the following subjects will be received on or before July 30th:—Hospital, Hothouse, Hyperbola, Ice-house, Infirmary, &c.)

"BUILDING NEWS" DESIGNING CLUB.

Drawings Received.—"Burswell," "Ogmore," Motto J.

Correspondence.

KILBURN FARM BUILDINGS COMPETITION.

To the Editor of the Building News.

Sir,—We deeply regret that this competition has been so barren in its results, and are quite at a loss to understand how the sapient judges could reconcile their ruling with their opening remarks. They complain that sufficient practical skill had not been exercised in the management nor constructive ability displayed in economically providing for carrying out the details to warrant them in awarding a prize; for anything we know to the contrary this may be strictly correct. What are we to understand by highly commended, and commended? Have these obtained the Hall mark of the R.A.S. and been set up as fit models for our study and imitation? The decision of the judges had not been made known when we left the yard late on Wednesday evening, and the time at our disposal was much too limited to enable us to criticise any of the designs. We have noticed a statement in several of the leading journals that the selected design for a dairy farm of 150 acres provided standings for 10 cows and 12 horses. If this be so, clearly the judges must have got into a fog, and mistaken a dairy for a stud farm, or can it be that their minds had reverted to the production of mares' milk, which amongst ancient nations was held in high estimation for certain reputed virtues?

As practical men, we look up to a R.A.S. for scientific guidance and instruction, and seeing that the recent competition has been so abortive, surely the council are in honour bound to publish in the next number of their journal a set of plans suited for each of the four classes of farms as set forth on the schedule of prizes. Instead of farmyards we would suggest that the title be that of farm homesteads; this would include a house for the tenant and cottages for his workmen, we take it. The latter is equally as essential as the former; in fact, what is required is a complete homestead, and in order to show that the judges are not survivals rather than growths of the living times, they above all others should be selected to perform the task.

In common with many others of the competitors who are largely interested in farm buildings it is painful to contemplate being the means of recklessly squandering the moneys of our employer. Personally, we shall feel deeply grateful for any hint in the right direction. Correct specifications and bills of quantities are essential requisites; priced quantities, to say the least, are simply misleading. In our own practice the cost of labour on a yard of brickwork varies from 10d. to 1s. 6d., and bricks on the bank from 21s. to 28s. per thousand. In the case of the Kilburn competition, the simplest method of comparing the cost was by cubing the contents of each separate design, and ascertaining what each cost per foot; much also depends on the locality and system of management the designer has in view. Buildings sufficient for a farm of 600 acres, on a certain description of soil and management might, under other circumstances, be insufficient for more than 400 acres. We must admit the fact that owing to the improved management of live stock, building requirements have greatly increased within the last few years. Without a knowledge of the exact circumstances, the average measure of cost is entirely fallacious; parsimony is not economy. The cost of a homestead depends very much on the way in which the details are carried out; we frequently come across sheds for dairy cows where the width inside is only 15ft., and the double stalls 5ft. wide; the only apology for a gripstone is a piece of wood 6in. by 2in., nailed to stakes driven into the ground. The floors are all unpaved, there are no mangers, no ventilation, no drainage; these are cheap, but are they economical, and such as the R.A.S. would conscientiously stamp with their approval? Competitor.

Sir,—The author of the letter signed "Agricola" in the current number of your journal is doubtless suffering from a feeling of disappointment, which appears to be keenly experienced by all the competitors; but I trust you will allow me, as the author of one of the commended plans, to reply to the five strictures he passes upon me, and that I shall be able to show they are totally incorrect and uncalled for.

"Agricola" would observe—

1st. "In every one of the commended plans the straw barn is placed either on one side of the buildings, or otherwise inconveniently so" (*sic*).

2nd. "Some of them have either badly-situated or too small root-sheds, or are totally devoid of them."

3rd. "Hardly one of them has more than one loose box; some of them none."

4th. "All have open or partially uncovered yards."

5th. "Not one provides a w.c. for the servants."

In reply, I may state—

1st. I show a straw barn sufficiently large to contain the produce of two days' thrashing, also a site for a Dutch straw barn if required. The former is necessarily placed on one of the four sides of the building, but an adjoining tramway has direct communication with all parts; the straw is delivered into it direct from the thrashing drum; and I think I am correct in stating that I was the only competitor showing provision for thrashing-stacks under cover, available in all weathers; and notwithstanding "Agricola's" remarks, I am still of opinion my straw-barn is most conveniently situate. I believe the public will shortly have an opportunity of again seeing the plans, as the editor of the *Agricultural Gazette* has offered to publish them in his journal.

2nd. I have yet to learn that it is either necessary or advisable to build a root-shed sufficiently large to contain all the roots consumed in a large homestead, and much prefer a moderate-sized store, with entrance doors 8ft. wide (to admit a cart occasionally, leaving the great bulk in well-covered and ventilated clamps formed in the stackyard, as near to the buildings as possible, with a portable tramway (Fowler's for choice) leading direct to the root-store and mixing room.

3rd. Instead of one loose box only, I have shown four, besides four feeding pens.

4th. All my yards are shown roofed in, well lighted and ventilated.

5th. The w.c. for servants, or, to be more precise, the earth-closet, is distinctly shown on the plans.

Whilst I do not attach undue importance to the commendation bestowed, I submit it is most unfair on the part of one whom I assume was a competitor to make such sweeping and unfounded charges against us, who have been sufficiently punished by the report of the judges to render the flinging of a stone by "Agricola" quite unnecessary.—I am, &c.,

Richard Waite, Architect.

Duffield, Derby, July 19.

Sir—My attention has been called to a criticism, or rather an attack, on the commended plans in the late Farm Planning Competition, Royal Agricultural Society, which appeared in your last issue, and which I had not previously noticed. The letter is signed "Agricola," the pseudonym adopted by me alone in the above competition. As the various mottoes, &c., were all published with the names of the various competitors attached, persons are, I think, quite justified in attributing, as they do, this letter to me. If, as appears to be the case, this communication proceeds from an architect who is thoroughly conversant with the whole matter, if, indeed, he is not a competitor, he was undoubtedly guilty of an indiscretion (when I first heard of it I employed a much harder word) in using this *nom de plume;* nor can I, Sir, acquit you, of some slight oversight* in the matter. These mottoes, &c., were all published, and I cannot but think you should not have allowed any other man to have taken the alias adopted by me in writing to you on the affair. I have a very strong feeling that it is excessively improper and ungentlemanly on the part of any man to attempt to criticise the plans of a fellow-competitor. I do not object to criticism; on the contrary, I think it should be encouraged, but criticism, real criticism, cannot proceed from an interested party; the strictures of such a person must always be unfair and misleading, from the nature of the case. Holding this opinion, you may imagine how I felt on receiving a letter from one of the gentlemen whose plans were commended in the Farm Planning Competition, rebuking me (very properly, on the supposition that I had done it, and quite justly, so far as it appeared) for writing such a letter. In consequence of receiving this letter I now write to you, repudiating, most energetically, all knowledge of the communication you have published, or of the person who wrote it. I can only hope, for the credit of the profession, it will turn out that it was not written by an architect, at all events, by a competing architect.

As I have been led into writing a letter, I should like, with your permission, to say a few words on the general question. No doubt the council of the R.A.S. was utterly wrong in not awarding one or more of the premiums, and it is a great pity that it cannot be made amenable to the law; however, I believe it cannot be made so amenable, and architects know it. I want, under the circumstances, to ask, what we can expect the public to think of professional men, who, having submitted drawings in competition, knowing this fact, attack everybody, including their fellow-sufferers, right and left when the competition is decided against them, or their drawings are not considered worthy of a premium by the judges to whom they have elected to submit them? Professional men ought, I think, to take the thing coolly, and try to find out what is wrong in their mode of procedure, instead of making themselves out to be the most injured individuals the world ever saw or ever will see. Persons write, urging architects to act together, after a competition is concluded; if we could agree at the beginning of a competition it would be another thing. The truth is that many architects wilfully blind themselves to the facts of competitions. If competitions are ever to be conducted as architects profess to wish, we must start by making the profession of architecture a close one, a thing which is not only impossible, but absurd. But supposing this difficulty surmounted, the next indispensable necessity to a theoretically perfect competition is a perfect form of instructions. But this means that the difficulties and doubts respecting the proposed new building are all got over, that every committee-man knows what he wants, and that all, or the majority, of the committee-men are agreed; whereas, practically, the only thing in which the committee, as a rule, is at all agreed, or can be agreed, is on the amount to be expended; that being the one condition which generally must be violated if the committee gets what it really requires and wants. Committees and individuals are all alike in this respect; they all need to be told what they want, and what is the mode and cost of getting what they want: and to expect a committee to hold fast to its own conditions, when it has drawings put before it, showing what it thinks it wants and likes, is to expect it to set aside the very object for which it asked for drawings. When an architect takes the trouble to compete, he ought first to remember that it is more than probable that thirty-nine other architects are about to do the same thing, that each several architect of the forty is sure to look at the problem to be solved in a different way, and that thirty-nine out of the forty are probably about to give themselves a great deal of trouble for nothing. He ought also to remember that he cannot, as a rule, be instructed by experts, and that probably it is a good thing he cannot be so instructed; he also ought to start with the notion that he has to supply what is really required, not necessarily what the committee asks for. If he is not prepared to do this he had had, perhaps, better leave competitions alone. With regard to the particular competition which has called forth this letter, there is this to be said for the farmers, unjustly as they have acted:—The one thing which is an absolute necessity for farmers, so far as architects are concerned, is cheap building. They absolutely need good and, above all, economical buildings, and the council advertised, perhaps unconsciously, but still really, not so much for the most perfect arrangements (these must be adapted to each particular case) as for good buildings which could be erected at half the usual cost. I did not realise this fact, though I knew that is what farmers need, till after the competition was decided. Too much money spent on a farm, even in matters of convenience, is money wasted, and the best farmers are beginning to find this out. They did not apparently get what they wanted in this competion, and, naturally, from their point of view, did not feel it was right to give the premiums.—I am, &c.,

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* There was no "oversight" on our part. The circumstances under which this letter was sent precluded us from knowing who "Agricola" was. The sender of the letter had better explain why the *nom de plume* "Agricola" was adopted, and save us the necessity of entering into further particulars.—Ed. B. N.

High-street, Rochester, July 21. John Drake.

P.S. I do not intend to say that the plans were not as economically designed as possible; I only go by the judge's report. For myself, I did not go to the Agricultural Exhibition at all.

Sir,—I am amused at the comments made by "Agricola" on my design, which received the high commendation of the judges. Should this person ever attempt again to criticise the works of others through a public medium, he will do well to exercise more care in his examination of the subject, and confine his statements to the truth.—I am, &c., W. A. Keates.

IPSWICH COMPETITIONS.

Sir,—As there is another competition advertised by the Ipswich Corporation, it may interest your readers to hear how two of the three recent competitions were decided, as may be gathered from the columns of the Ipswich daily paper. I therefore venture to inclose you one upon the competition for adapting the public hall, which needs no comment.

The Museum competition was decided by a committee, who first of all considered the plans and then selected three designs by voting out those that were not thought best. When they had reduced them to three, viz., "Pinpatch," "Simplicity," and "Bona Fides," they decided to give their president, Sir Richard Wallace, a chance of expressing his opinion, and so sent these three to him. At the next meeting the whole question was reopened, and they proceeded to vote by ballot, each committeeman voting for three plans out of six. This left "Economy," "Bona Fides," and "Architect," the three highest. They then each voted for two out of the three, and the result was "Economy," 11; "Architect," 10; "Bona Fides," 9.—I am, &c.,

Cautious.

THE GLOUCESTER ASYLUM COMPETITION.

Sir,—Your correspondent in last week's Building News speaks very disparagingly of Mr. Philips, clerk of works for the county. Knowing he has held many high positions in London, I feel constrained to defend him, and consider he is entitled to more respect than your correspondent would assign him.

As the "Instructions to Architects" in this competition were prepared by the committee and Mr. Philips, it may safely be inferred they know what is required in a lunatic asylum; and as the committee have requested Mr. Philips to prepare a report regarding areas, spaces, &c., in the several designs, it appears they do not mean to delegate their duty to anyone, trusting to their own knowledge and the test of figures to be laid before them.—I am, &c.,

An Outsider.

THE RAMSGATE PROPOSED NEW ROAD COMPETITION.

Sir,—I inclose herewith a cutting from the *Thanet Advertiser* of July 19, referring to a meeting of the Local Board on the previous day.

The matter has ended in the vindication of the views of those of your correspondents who looked upon Mr. Abernethy's arbitration as being influenced by his connection with the L.C.D.R. extension scheme.

I regret that so many other competitors, as well as myself, should have had our time wasted under such a foregone conclusion. The matter will probably now result in the payment of the percentage for amended plans to Messrs. Abernethy and Cummins. Their projected "Back Road" will certainly never be carried out, and the judicious sea-front improvement, that would have had an influence upon the future prosperity of Ramsgate, will probably be thrown aside altogether in the dissatisfaction engendered by the expenses incurred in bolstering up an abortive scheme.

It is strange to find the chairman of the commissioners, whose influence is all-powerful at the Board, and who has hitherto, I believe, been the consistent advocate of a Front Road, holding the views he now professes. It seems a mistake (to say the least of it) after spending £2,261 in getting the Improvement Bill, to make the new road, to hold now that none can be made without the help of the railway company, whose interests had never been heard of even so late as the initiation of the competition.—I am, &c.

W. G. Osborne,
Author of the design "Front."

Ramsgate, July 23.

Sir,—Your correspondents, "Via Melior Iter Brevius," whose laboured yet futile attempts to be funny appeared in the Building News of last week, are in error in saying that their "design (?) specially includes an arrangement similar to that *for the first time suggested* by Mr. W. V. Green." It is an indisputable fact that for the past twelve years I have had before the town of Ramsgate a model showing the original *design* for the proposed new road or marine drive, combined with an extension of the London, Chatham, and Dover Railway, a new approach from such road to the pier and the sands, as also the plan for the new esplanade commenced by the late E. Welby Pugin, and now termed the "Marina." This model is no mere toy, but is constructed in wood to an exact scale, from careful surveys and measurements, there being at that time no Ordnance map from which to work, and its dimensions are 10ft. by 3ft. The lines shown in this model have, with but slight variations, been adopted on the Parliamentary plan, and by nearly all the competitors. Early in 1872 I invited Mr. Forbes to inspect this model, with a view to the formation of the proposed new road, conjointly with the railway extension.

I may state that the Ramsgate Improvement Commissioners, at a meeting on Friday last, decided to adopt this joint scheme, subject to the approval of the Railway Company, and Mr. Abernethy (?), with another engineer, are to be employed to carry out the scheme. The only divergence from the original design is the making of the new road a few yards to the north-west of the lines shown on model. It is said, and perhaps with much truth, that this slight divergence will materially interfere with the trade of the town, and add very much to the cost of the undertaking.

With regard to the use of cantilevers, permit me to inform your facetious yet dissappointed correspondents that I never proposed to "so responsible a corporation as the Commissioners of the town of Ramsgate" to "bracket a large portion of an important public road and promenade for a considerable width from the face of a cliff of such an uncertain character as chalk, and that without any other means of external support." The original design, as worked out on model, shows the projecting *pavements*, not roadway, supported by iron girders and columns. Do your correspondents suppose I intended to stick a few brackets in the face of the chalk cliff without any other supports? If so, their simplicity exceeds that which I give them credit for, and that is saying a great deal. As the printed "instructions" to competitors made it imperative to interfere as little as possible with the Military-road—over which the projections were to be—I simply showed an alternative scheme for supporting such projecting pavements, and if this be practicable on bridges, why not on solid masonry or brickwork?

As stated in my last, the gradients worked out in the model in question are 1 in 37 in the west and 1 in 30·3 on the east of Harbour-street, and "wonderful" as they may appear to your correspondents, they are perfectly practicable without inconvenience to adjoining property or departure from the instructions to competitors, which provides that the vertical deviations allowed by Parliament may be exceeded by "agreement" with the owners of the property interfered with. Indeed, neither of the premiated drawings comply with the Act of Parliament as to vertical deviation.—I am, &c.,

W. Vincent Green.

St. Lawrence-on-Sea,
July 21st.

THE DECORATION OF THE DOME OF ST. PAUL'S.

Sir,—If the work of Sir James Thornhill is to be obliterated, it will not be very encouraging to living artists to trouble themselves about designing anything to replace it. The painting should be restored, and as a coloured picture at that distance could not *tell* satisfactorily, a coloured varnish of blue should be applied to the upper part or background, and a sienna varnish to the foreground, both graduated towards the centre, and an ornamental border of gold in a new design, if desirable, might be added as well, as new rib decoration between the pictures.—I am, &c.,

Walter Scargill.

SPECULATIVE BUILDERS: THEIR TRIMMINGS AND FINISHINGS.

Sir,—It has often occurred to me that no little good would sometimes accrue if peculiar examples of what not to do in building were occasionally pointed out in less general terms than those usually employed by writers of leading critical articles in the professional papers, where space is limited and minor details have necessarily to be passed over. Of course, it is the easiest thing in the world to find fault; but a fair description of bad building and bad so-called architecture can but point to one moral, even if there be but little with which to adorn the tale. The mere constructional defects of modern speculative buildings have so often been enlarged upon and are everywhere so well known that I would not dwell upon them here, electing rather to quote a few examples of the misdirected outlay by builders in the matter of their trimmings and finishings to the houses which they build. Money is thus foolishly wasted, which, had they but the common-sense to see or good taste to know, would be well expended by engaging an architect to prepare at least a detailed elevation for them, or at any rate in allowing good, honest simplicity to tell its own tale. At present, even on the better building estates, the designs, at first perhaps prepared by the local land-agent, who has arranged the property for sale, are watered down and altered as the work goes on to suit the fancy of each builder who individually speculates with the plots. An amusing instance of this has occurred within the past few months on an estate near Hammersmith, called, I believe, Ravenscroft Park. Nothing could perhaps have embraced more grandiloquent pose or gaudy details than the original design for the villas under notice. The earlier examples are apparently carried out to the letter, and can cause to the educated mind but the one regret that so much enterprise should, from an art point of view, have been so utterly wasted. Party-coloured brickwork, elaborate carvings and incised work, and phizzy cast-iron cresting and finials embellish the whole. This is all usual enough; it is, however, the same design cut down that strikes one. The diagram Fig. 1 will give an idea of the original arrangement of bay windows and their roofs, while Fig. 2 shows how the high-pitched finishings of these bays have been preserved, finials and all, in the later villas of the same design, where the main building has the ordinary hipped single span by way of a roof, to save the cost of the first idea. As there are a very large number executed thus, it can easily be imagined how a long row of detached villas look in sharp perspective with such conspicuous features as these semi-conical roofs with their perfectly vertical zinc backs upright, like spikes in the air. The same ornate carvings and trimmings are preserved throughout the façade. Take another example; this time from the North of London, near Finsbury-park. Here a terrace of houses are arranged necessarily to rake with the fall of the street, and so the trimmings, such as cornices and stringcourses, are made to step to the altered level every third house. Fig. 3 will show how this has been managed. The break occurs immediately over the entrance doorway in the entablature of the pilastered portico, as indicated in our diagram. Judge the effect! Again, in trimmings few details are more foolishly treated than the columns to the bay-windows, a feature seldom absent in a speculative builder's house. If of stone, they are mostly enriched with caps, having foliage, of course, of the worst possible description, but arranged so as to rake on plan with the cant of the bay, thus producing a pinched-up outline when looked at sideways, but appearing, on the other hand, equally squat when seen from the front of the angle. Should the columns be of iron, undoubtedly they will be marbled in the most impossible way. At Dulwich, a series of houses are built having arched hoods to the doorways of solid brickwork, finished in a gable somehow as shown by Fig 4. The caps are of stone, and so are the bases, which are perfectly plain, thus giving emphasis, as it were, to the concentrated essence of strength in the marbled iron columns of about 2in. diameter. Speaking of hoods over doorways, the wooden examples to the Queen Anne houses at Chiswick, designed by Mr. Shaw, R.A., deserve to be noticed, simply on account of the foolish mistake made by those who have built them. The original design was shown with a slight shadow to indicate the different thicknesses of the main bracket, and the capping piece over it (see Fig. 5), but this shadow was taken to mean a semicircular shoulder to the tenon, as at A, and so the whole affair, as executed, seems as if intended to tip up, on the principle of a dung-cart, to let the wet off. Surely this is little better than a joke. But, for all that, I see the mistake is religiously continued. A little further west, at Brentford and Kew, all sorts of impossible things are done in the way of porches. Near West Kensington Station, a row of large stone-fronted houses have just been finished, with all the vulgar richness of detail typical of this class of work, of which miles and miles are now being built about London. These particular houses deserve remark, because they show how utterly wrong and out of place the key-stone trimming becomes when used, as it is here, in arches which are in no constructional sense arches at all. Of course it is a primary mistake of the first order itself to employ arches in this way, but one would be inclined to overlook the mistake were the fact not thrust upon the view by the keystone features referred to. Perhaps few things more laughable can be seen in London than the terra-cotta keystones lately introduced into the flat arches of a dingy old house at the end of the Strand, in front of the Courts of Justice. There is one thing yet, however, which surpasses this—yes, two, one is the bent "tall-boy" over the central gable of the Memorial Hall in Farringdon-street, a building *recherché* in the extreme, while it is moreover, the work of an architect, and the acrobatic tower of "Tower Chambers," in Moorgate-street. This elaborate so-called tower surmounts a segment arch, circular on plan, so that when seen sideways a great void yawns below the massive superstructure, which is crowned with the conspicuous feature just referred to. This design, I am told, is the production of a firm of auctioneers and land agents. But then Mr. Norman Shaw, I also hear, is building flat arches at Chelsea without any skewbacks, and tying up cut and carved brickwork to iron girders. So what becomes of the premises with which I started this letter, if even "R. A.'s" will do such things? One more example of the improper execution of trimmings, this time from the country. During the recent examination of the cornice and entablature of the Ipswich Town Hall, after one of the consoles had fallen and killed a man, it was found that the cornice-stones, instead of having only one bed, had no less than three, and the dentils where not worked out of the solid, as they should, of course, have been, were pegged on, as shown by Fig. 6, with wooden pegs. This building had two architects, one clerk of the works, and one town surveyor to look after it. With such facts in the face, how can we hope for the reform of mere speculative builders?—I am, &c.,

An Old Tee Square.

FIG. 1

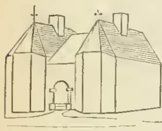


FIG. 2

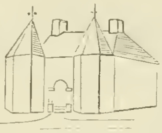


FIG. 3

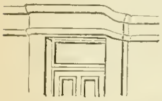


FIG. 4

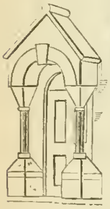


FIG. 6

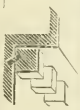
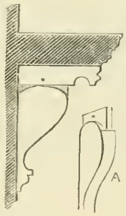


FIG. 5

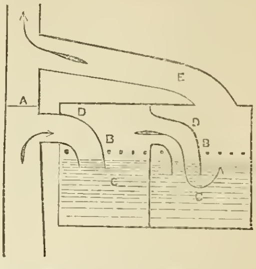


THE SMOKE NUISANCE.

Sir,—For some months back the state of the atmosphere has been so peculiarly bad and cheerless from the extraordinary bashfulness of the sun, that anything which tends to make matters worse calls for special attention. In large cities like Glasgow, with many public or secret works vomiting forth clouds of smoke from their chimneys, both by day and night—some I am told are worse at night—the contamination of the atmosphere is often very disagreeable, and must have a considerably injurious effect upon the health of the inhabitants. In many cases, and especially in Glasgow, the purification of the atmosphere is of a hundred times more importance to the health of the citizens than the purification of the river, although the latter has occupied the minds of the local as well as Government officials so much of late. A great deal was said some time ago about various modes of curing the smoke nuisance, but at present very little good effect seems to be produced. Burning the coal-smoke by the fire which causes it has been tried. Water spray thrown into the chimney has also I hear been tried, but at Glasgow, little practical good effect seems to be produced, judging from the clouds of smoke daily to be seen rising or falling into the air.

One night lately on walking up Garnet-hill, I entered a cloud of sulphurous smoke, so strong and dense that I preferred turning back to walking through it. This ought to be stopped. As one method of cure, I beg to suggest that the smoke should be made to pass through water and perforated plates, before being allowed to mix with the atmosphere, the smoke being drawn through the water by means of an air-pump or fanners. The following rough sketch will help to explain my idea which might be tried, at first upon a small scale. A is a division across the chimney. B B are two plates of perforated metals, which may have cleansing brushes in connection with them. C C is the water contained in the purifying tanks. D D are the smoke flues. At E the air-pump is supposed to be placed. Has this plan been tried? If not, let it, or a better plan be tried till a practical cure is really brought forward.—I am, &c.,

Glasgow, July 19th. W. P. Buchan.



CHIPS.

The reclamation of Brading Harbour, which has been carried on with unremitting diligence during the last two or three years, has now terminated successfully, and an immense tract of what we hope will be ere long arable land has been added to the Isle of Wight. Mr. Saunders has had the direction of the work.

A new chapel has just been opened in the North-road, Aberayron. It is Norman in style, and occupies an area of 36ft., by 40ft. depth. Externally the walls are of hammer-dressed rock, with Bath dressings. The interior fittings are of pitch-pine, stained and varnished; the principal roof timbers are exposed to view, but the intermediate spaces are plastered. The windows are glazed with quarry rolled glass; the lobby and passages are laid with tiles. Mr. George Morgan, of Carmarthen, was the architect; and Mr. Evan Evans, of Llanybyther, the contractor. The cost was £700.

Arrangements for the completion of the docks at Milford, Pembrokeshire, have now been completed. An amicable arrangement has been made with the slate contractor, Mr. F. Appleby, of Manchester, whose connection with the docks ceases, and the work has been undertaken by Mr. Samuel Lake, of London and Weymouth, who will carry it out under his own personal supervision, and has undertaken, under heavy penalties, to complete the contract by the 1st March next.

A bust of the late Sir Francis Goldsmid, Q.C., M.P., executed in marble by Mr. Theed, has been presented to the Honourable Society of Lincoln's-inn by Lady Goldsmid.

It has just been determined to erect a third district church in New Swindon, and a site has been chosen in the centre of the town, at the back of Regent-street.

A singular coincidence occurred at St. Nicholas parish church, Great Yarmouth, on Sunday week. The vicar, in the course of the morning sermon, expressed his gratification that the church restoration debt had been liquidated, but added that the west portion of the edifice was in an unsafe state and required repairing. Just afterwards the congregation was startled by hearing a rumbling sound from the roof at the west-end, and this, it was afterwards ascertained, was caused by a portion of the stone coping giving way and falling upon the roof.

The unsightly, ill-contrived, and badly-built old bar-room of the Court-house at Cork has been swept away, and in its place a commodious and larger room has been erected from the designs of Messrs. Robert Walker, senior and junior. The room has a central lantern-light, and is wainscoted in panels above a moulded dado. The woodwork has been varnished, but not stained. The furniture is in oak, of substantial character. Mr. Edward Kearney was the contractor, and the cost has been £400.

Contracts for new board schools have just been let for the Rotherham School Board; one situate at Blackburn, and the other, with master's house attached, situate at Knubsworth. Plans have been prepared, and the work will be carried out under the superintendence of the architects to the board, Messrs. Tacon and Rawson, 11, Westgate, Rotherham.

An organ-chamber is being extended from the south side of chancel of St. Peter's Church, Ipswich. Mr. G. Gilbert Scott, M.A., F.S.A., is the architect, and Messrs. J. B. and F. Bennett, of Ipswich, are the builders.

The Leyton School Board are about to enlarge their schools in Church-road and Kirkdale-road, from plans prepared by Mr. Newman, their architect.

Intercommunication.

QUESTIONS.

[5839.]—**Hospital.**—Can any reader inform me when the Southport Convalescent Hospital was erected? An approximate date would suffice.—Thos. McGeorge.

[5840.]—**Damp from Salt in Cement Flooring.**—In a large building on the S. coast, near the sea, a cement flooring was laid down, mixed according to the usual formula, about six months ago. It had a hard even surface, and is so far satisfactory, but whenever it rains rapidly changes to a dark colour, becoming very damp, owing to the fact, as it is supposed, that the gravel taken from the sea-shore was not washed free from salt. Can any of your correspondents kindly suggest any remedy? How long will the salt in the cement take to evaporate?—Ignotus.

[5841.]—**Finishing Arches.**—Will any kind reader inform me the best way to finish rough axed arches in brick? What to put with colour to make it fast to stand the weather, and what kind of steppings?—W. R.

[5842.]—**Statics and Dynamics.**—Will any passed candidate in the proficiency class of the R.I.B.A. exam. kindly inform me of the best book on statics and dynamics, one containing sufficient knowledge to enable me to do the "Physics" papers set in this examination?—Eff. Tee

[5843.]—**Surveyor's Charges.**—What is the usual charge for laying out land in building allotments, including survey and plans with contents of each allotment, and staking out?—Ignoramous.

[5844.]—**Architect's Responsibility.**—Is an architect responsible for goods ordered by him on behalf of a client who is now unable to pay—the order sheet being headed with the name of the client and the goods delivered to the client on his building? Can any correspondent refer to a case or give experience?—Fairplay.

[5845.]—**Fire-Proof Floor.**—I want to construct a light fire-proof floor, with plain tiles laid to break joint on girders, and should be greatly obliged if some kind contributor to your "Intercommunication" column would favour me with following particulars of construction:—How far should the girders be apart, say, for a floor 20ft. wide? How many courses of tiles? What is the method adopted in laying the first course? Any other practical information on the subject will be thankfully appreciated.—Verdoyant.

REPLIES.

[5787.]—**Strains on Collar Beam Roofs.**—I observe the following facts:—On June 6th "S." first appeared as an inquirer on the above subject, and stated that neither tie beams nor purlins were to be supposed in discovering the strain on the collar of an ordinary span roof. On June 13th I replied and stated the collar to be in tension, &c. On June 20 "S." thanked me for my reply, but took exception to my view, and used terms in science which I viewed as quite inapplicable in the way in which he used them, and which I should find difficulty in applying to a collar beam roof, at any rate, with any advantage, and I moreover marked that "S.," an inquirer the week before, now assumed the functions of a critic on the reply. If "S." knew better than I did, I am at a nonplus to imagine what induced him to write for information in order that he should criticise the writings of those who would not need to inquire themselves, and I criticised his letter perhaps almost too severely, and if so he must, if he will, forgive me. But, however, to business. He stated that with the collar high on the rafter the collar then became a strut, tending to prevent the rafters from bending under their load, and he presently says that he is inclined to think, &c., and after that before he finishes for that time, if I do not misunderstand him, he allows one to suppose that the strains on the upper parts of rafters, and on the collar itself, could be determined separately, and that the result would give a tensile strain on the collar, &c. On July 18th he states that he says nothing about a tie between the collar, "nor about a queen-post truss." No, but he said an ordinary span roof and a span roof having walls thick enough to resist with safety the thrust of the feet of the rafters without a tie would be an extraordinary span roof, and his question therefore, if the collar be no tie, necessitated the supposition of a tie below the collar of some kind. With respect to the language he used not requiring defence, I consider, as I did, that his language or terms were not calculated to elucidate science. I gave my views on that in my former letter. He next says that my solid slopes are too unlike a real roof. Why so? If common rafters be boarded or battened they will become similar to my solid slopes, except that the rafters would have a bird's mouth at the foot, and I put at the foot of mine, wheels or rollers to run across the top of plate. I assume the plate will offer no resistance to be counted or relied on, and a model could be made of model rafters and slating battens, which would still give the same result. "S." then goes on to say that in the majority of lightly timbered span roofs with collars, but no ties at the plate level, he says, "in the majority of these it will be found that the plate has been more or less thrust outward, and that the rafters have bent under their load." Who will doubt it? I will venture to assert that were the collar not a tie the plates would, in the majority of cases, be pushed out altogether. In "S.'s" former letter he thought that the part of rafter above the collar exercised a tensile strain on collar (which it does), and he now proves the feet of rafters tend to part, and it is therefore probable that the rafters tend to part all along, and the collar will always be in tension unless the thrust at the feet of rafters be more than resisted on both sides of roof. With respect to cross strain, as "S." calls it, I am quite aware that a rafter has a tendency to sag, but if the collar were only a strut and, say, mortised and tenoned into rafter and made to fit easy, and if the plates were unequal to the thrust at feet of rafters, the rafters would leave the collar and the same would drop out, and the roof would fall. "S." says that I ignore the force acting perpendicular to the rafter, and he is right. I do ignore such a force. The force which bears on the rafter is the gravitation of the roof itself, which is vertical, and the resistance to the top ends of the rafters causes a thrust parallel to axis of rafter, and is due to the gravitation on half of roof slope if the feet of rafters be resisted, and the consequent thrust along the rafter, and the vertical pressure of gravitation or resistance from the wall supporting compose the horizontal thrust, and which may again be resolved into its component parts. With respect to the last part of "S.'s" letter, I replied to that before very distinctly—viz., that assuming once more that the wall plate does not in an ordinary span roof resist the horizontal thrust of rafter, then the collar will be in tension in order to resist the tendency of the rafters to part, and that it cannot be in compression and tension at one and the same time. "S." can prove the principle by getting two thin lathes of flexible wood—say, 1 by ⅛in., and put them at the top, flat sides together, and let them be 18in. long each, and tie a string 12in. long from centre to centre, and then pull the feet asunder, not too violently, and he will see that they will bend both above and below the tie, which being string, cannot be a strut, and his rafters and collar would behave the same. "S." has also discovered that there is a weak point. I have thought so all along, but if "S." should succeed in understanding the weak point I see I should no longer discern. I add four sketches of collars under different conditions, which I should think would wind the discussion up, because if "S." should fail to understand now I think I must consider any further efforts of mine for his instruction would be labour in vain so far as he is concerned. He may perhaps say that I have shown collars in compression, but I must tell him that such cases are not ordinary span roofs which were those under discussion, and therefore his idea that a collar is in compression in an ordinary span roof is a mistake. In Fig. 1 *a a* show the new work settled; *b* is the old brick work; *c*, collar in compression. In Fig. 2, *a* shows ridge piece shrunk ¼in. in thickness; *b*, collar in compression. Walls in this sketch are more than equal to thrust of rafters. Fig. 3, *a*, chain collar in tension. If collar were wood not tied, it would drop out, and walls would be pushed down. In Fig. 4 the collar becomes a strut, as the rafters are tied below it, but it is not a collar beam roof now.—Henry Ambrose.

FIG. 1

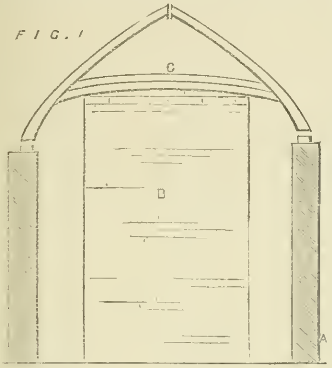


FIG. 2

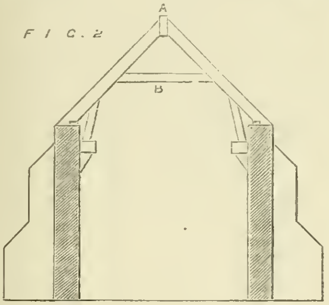


FIG. 3.

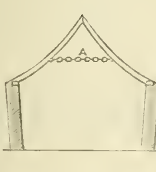
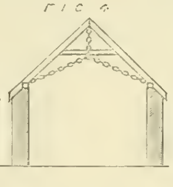


FIG. 4.



[5803.]—**Proportion in Church Architecture.**—The proportion of chancels in this country used to be width $2a + 5$ft. by length $5a$, so that in small churches the chancel approaches a square, for when $a = 2$, $2a + 5 = 9$ and $5a = 10$, but when $a = 10$, $2a + 5 = 25$, and $5a = 50$ as in archidiaconal churches. In cathedrals $a = 15$, and choir is then $2a + 5 = 35$, and $5a = 75$.—Walter Scargill.

[5825.]—**Architect and Client.**—The copy of quantities should have included the item for surveyor, as the client can say he was misled into a larger amount than he contemplated. "Anxious Inquirer" can, of course, charge the usual commission for plans, but I do not think he can now recover for the quantities, unless he had definite instructions to prepare them. As to charges the following can be made:—2½ per cent. for drawings and specifications, and ½ per cent. for procuring tenders, besides extra expenses in travelling, &c.—G. H. G.

[5833.]—**Architects' Charges.**—The most recent decision on architects' charges was in the case Varley v. Cermandy, tried at the Lancaster Assizes on the 11th inst., when a verdict was given for the full amount claimed—viz., 3¾ per cent. on the lowest tender for plans, specifications, and details, exclusive of superintendence, the work not having been carried out. As to tracings for Corporations and other purposes, a reasonable charge should be made for all sets beyond one set for the contractors.—Furness.

[5833.]—**Architects' Charges.**—The charge, exclusive of superintendence, will be 2½ per cent. for the preparation of drawings and specifications, with the addition of ½ per cent. for obtaining quantities. Of course, all incidental and other charges must be added, including quantities if prepared.—G. H. G.

[5835.]—**Cast-iron Girders.**—In reply to "F.J.F.," a reliable rule would be Fairbairn's formula $W = \frac{C\,A\,D}{L}$ where W = breaking weight in tons, A = area in inches of bottom flange, D = depth in inches, L = length in inches, and $C = 15$. W would be not less than 5 times the greatest possible safe load, and if moving then 8 times. The top flange should be 1-6th the area of bottom flange, and the web not too thin, and stiffeners every 5 or 6ft. apart. They are, I believe, but little used now, equality of thickness in the metal, and as thin as possible in reason, should be adopted. It is best to have all necessary holes cast in them, which will save drilling.—Henry Ambrose.

[5835.]—**Cast Iron Girders.**—The following is a simple method of calculating the breaking weight of cast iron girders:—Take a girder 8in. deep in the web, the bottom flange 12in. wide 2in. thick, 8ft. bearing. Multiply the breadth of flange by the thickness in inches, and then by the depth of web, divide by the length of bearing in feet, multiply the result by 2·14, which will give the breaking weigh in tons. Thus, $12 \times 2 \times 8 = 192$, then $192 \div 8 = 24$, then $24 \times 2{\cdot}14 = 51{\cdot}36$, 51·36 tons the breaking weight.—B.

[5837.]—**Tile Painting.**—Turpentine and fat oil of turpentine are required for mixing the pigments, which may be obtained at Howell and James, Regent-street, London, or Stoner's, Lord-street, Liverpool. State whether pigments for over glaze or under glaze are required. Colours may be bought in boxes from one to five guineas, or singly in bottles from 8d. Spirits of wine, or methylated spirits, are required for cleaning pallettes or erasing the colour from the tiles. Howell and James have published a small handbook at 6d., and Hancock one at 5s.—X. 4. 3.

WATER SUPPLY AND SANITARY MATTERS.

Sewage Utilisation at Selkirk.—For about eighteen months past Mr. John Drysdale, of Glasgow, has been engaged on a contract in connection with the drainage of Selkirk. Under the old system the sewage was discharged into the Ettrick, but the new works include a system of precipitation and irrigation. About six acres of gravelly holme land along the side of the Ettrick has been taken in, and on this the sewage, after passing through the precipitating tanks, is discharged by a series of sluices. The cost has been over £6,000, and by it the requirements of the Rivers Pollution Prevention Act have been fully complied with. The works were formally "opened" on Saturday. The commissioners of Selkirk have also just had public slaughter-houses erected outside the town at an outlay of £600.

Teignmouth, Devon.—The Local Board of Teignmouth have received a report from Messrs. R. Dymond and Sons, of Exeter, whom they had consulted with reference to the improvement of the sewerage of the town. They recommend that the following main features of a scheme of reconstruction be carried out at once, viz., (1) the diversion of the Tame Brook; (2) the construction of an intercepting sewer for the high-level district; and (3) the formation of a new main sewer for the low district, as a substitute for the present course of the Tame Brook. These three works, which the engineers consider of primary importance, are estimated to involve an outlay of £4,000.

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The annual excursion this year of the Architectural Association to the neighbourhood of Wells and Glastonbury seems likely to be very popular; indeed the stipulated number of 30, to which the party is usually limited, has already been extended to nearly 40, beyond which circumstances will not permit any extension.

The interesting parish church of Foxton, Cambs, almost the only unrestored church in the district, and now in a bad state of repair, is about to be restored from the designs of Mr. Ewan Christian, under whose direction the chancel, built in the 13th century, was recently restored. The estimated cost of the work now proposed is £1,650, most of which has been subscribed.

STATUES, MEMORIALS, &c.

Edinburgh.—Operations have been commenced for the erection of the monument to Dean Ramsay, in the inclosed ground, on the level of Princes'-street. The monument has been executed by Messrs. Farmer and Brindley, London, from drawings by Mr. R. Anderson, A.R.S.A. The design is that of a granite cross, rising 26ft. from the ground, and having a width of 8ft. 6in. from end to end of the arms. On each of its main faces the cross is divided into panels, in which are inserted bronze bas-reliefs, worked out by Messrs. Farmer and Brindley from Mr. Anderson's sketches. Those occupying the head and arms of the cross represent the various stages of the Passion, together with the Resurrection and Ascension; and in another series of six, placed three on either face of the shaft, are set forth the Acts of Charity—visiting the sick, clothing the naked, &c. Large panels at the foot of the shaft are filled in with sculptured ornament of fine 12th Century type, such as is to be seen in Jedburgh Abbey. In the same style have been treated the bronzes for the small panels formed along the sides of the cross, as well as the stonework of the circle connecting the arms. The material employed in the work is the reddish granite quarried at Shap, in Cumberland. The erection of the monument has been intrusted to Mr. Peter Sinclair, builder, Edinburgh.—There is now in course of execution, at Mr. John Rhind's Granite Works, Pitt-street, a monument designed by Mr. W. Brodie, R.S.A., and intended to be erected in the Dean Cemetery, as the tribute of friends to the memory of the late Sam Bough, R.S.A. The structure is of simple, massive character—its material granite, its leading feature a bronze relievo of the late artist's head, modelled by Mr. Brodie. A base 5ft. wide supports a large slab, which tapers away to a width of 3ft. at the top, and is surmounted by a moulded cope, the total height of the monument being nearly 10ft. In the centre of the slab will be inserted the bronze head, which is inclosed in a circular panel overhung with a wreath of bay leaves. On the ledge of the base will be placed a palette and sheaf of pencils, also worked out in bronze. While the front of the main slab is polished, the remainder of the monument is axed to a fine surface; and in both cases the grey granite of New Galloway has been selected for the work.

CHIPS.

On Monday afternoon the memorial stone of a new Congregational church for the township of Hucknall Torkard was laid. The style of architecture will be Gothic, and the front is to be principally of stone. On the basement a school-room and four class-rooms will be provided, capable of accommodating about 150 children, whilst the church itself is planned to seat upwards of 270 persons. The roof will be open timbered. Messrs. Smith and Heathcote, of London and Manchester, are the architects, and the builder is Mr. Joseph Munks, of Hucknall Torkard.

On the same day the foundation-stone of a new Free Church was laid at New Stevenston, near Holytown, N.B. The style is Early English. The dimensions are 70ft. by 48ft. and 38ft. internal height of roof, with a belfry 70ft. high. Mr. Alexander Hinshelwood, of Wishen, is the architect; Mr. James King, of Motherwell, the contractor for masonry; and Mr. A. Millar, of the same town, for joinery. The church will seat 660 persons.

Our Office Table.

On December the 8th, 1759, Dr. Johnson wrote a letter with reference to the drawings submitted in competition for Old Blackfriars Bridge, in which he says with reference to "questions of general concern there is no law of government, or rule of decency, that forbids open examination and publick discussion." Since these words were written architectural competitions have been well-nigh innumerable, and still the utterances of the great lexicographer are true and applicable. With a view of bringing forward the importance of a *proper public exhibition* of the entire series of the designs in all *public competitions*, a "Fellow of the Royal Institute of British Architects" has just published a brief pamphlet, chiefly bearing upon the City of London school competition, and his remarks, starting with the above quotation as a text, are well-timed and dispassionately written. The necessity and advantage of competition is at once acknowledged by the author, who joins in our often-repeated opinion that the leading members of the profession must look rather to the reform than the abolition of the competition system. The main causes of the evils at present connected with competitions are chiefly due to two reasons. The principal of these is the practice of leaving the decision of the award to persons who have not had the special technical training requisite to understand architectural drawings and their constructive details, and the second is the use, or, as the author of the pamphlet before us justly remarks, the *abuse* of the motto system. Both of these objections have certainly been illustrated by the way in which the City of London School Competition has thus far been conducted. In our article published on the 11th inst. we pointed this out as likely to be the cause of failure in the then pending award, and the truth of our remarks has been realised by the actual results of the decision of the committee now made public; at any rate it is so as far as the second and third premiated designs are concerned. It might be difficult on the whole to find a better design on all points than that selected for the first place, but we think with "F.R.I.B.A." that an assessor of eminence, say, the present president of the R.I.B.A., should have been called in to advise on the whole of the designs before the present award was confirmed by the Court of Common Council. The council includes amongst its members five leading architects as well as several eminent builders, and yet none of the gentlemen were on the committee who reported upon the designs for the Corporation's new schools. We find the names of the committee who signed the report on the plans was composed of 3 merchants, 2 sugeons, 1 druggist, 2 solicitors, 2 wine merchants, 1 corn merchant, 2 watchmakers and silversmiths, 2 wholesale stationers, 2 stockbrokers, 1 fish factor, 1 type-founder, 2 shirt and collar makers, 2 trunk makers, 1 meat salesman, 1 agricultural implement engineer, and only 1 builder. Now, what could these good people know about the matter from a technical point of view, in other words asks "F.R.I.B.A.," even though they were assisted by an architectural clerk from the office of the city architect at the Guildhall? It was not, writes our author, as "disappointed competitors," but as members of an honourable profession, that the architects who unavailingly, it has proved, petitioned the court, desired the appointment of an architectural referee, who should hold an independent position, and so secure a higher expert to advise as to the award than a clerk who had assisted in the preparation of the official but rejected design, and who knew, according to his own statement to us, the names of the authors of some at any rate of the competition designs.

The clergy, as a rule, are better patrons than practitioners of architecture. An instance is to be found in the achievements of a reverend amateur at Dublin, Father Ebenrecht, of the French college at Blackrock, from whose designs a new chapel has been erected at the Mount Sackville convent, Phœnix Park, Dublin, which, according to the *Freeman's Journal*, is "a work that will take a foremost place among the ecclesiastical buildings of Dublin," the only matter for regret being that consideration of pounds, shillings, and pence forced its author to modify his ideas. The style is "Modern Gothic," and Father Ebenrecht, like Sir Gilbert Scott's master at Leyton, seems to have found Modern Gothic terribly expensive, chiefly on account of the large amount of cement used. The exterior and interior are cemented with the best Roman cement, the ceiling is groined and plastered in imitation of Caen stone. There is more cement in a "curious but pleasing" feature over the high altar in the shape of a niche, with a sham groundwork of cement broken up to imitate rocks on which stands the figure of the patron saint. This niche is illuminated by an invisible headlight, and the "effect of the arrangement must be seen to be realised," the appearance presented being that of a window "stained in a peculiar manner with exquisite gradations of light and shade."

Mr. Chares Landseer, R.A., died on Tuesday evening at his residence in St. John's Wood, in his eighty-first year. He was the elder brother of Sir Edwin Landseer, and was, like their father, an artist from his earliest days. For more than half a century his works have been hung on the walls of the Royal Academy, his first picture having been shown there in 1828, and the venerable painter was still able to contribute to the present year's exhibition. He was elected an Associate in 1837, and eight years afterwards he became an Academician. When the Keepership of the Academy became vacant by the resignation of Mr. Jones in 1851, Mr. Charles Landseer obtained the appointment, which he continued to hold till his failing health compelled his resignation about six years ago. He then retired in the enjoyment of a pension equal to the salary of the office which he quitted.

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THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 1, 1879.

HISTORICAL ALTARS.

In the temples of Paganism, as in the shrines of Christianity, the altar has always been, if not the centre, the head and crowning adjunct of every religious edifice. Whether represented by a stump of wood, a block of marble, a vast artistic elaboration, or a simple covered table, it has in every age been a symbol and a rallying point, and there are many interesting episodes connected with its history, merely as regarded in relation to the general annals of sacred architecture. Originally, of course, the altar signified a table dedicated to sacrifices, as in ancient Rome and Greece, though not at Pompeii, and altars were consecrated to gods, goddesses, and heroes; but, on the disappearance of heathenism, their use for the celebration of religious ceremonies, unconnected with any of the obsolete rites, was continued, the varieties being distinguished by a large body of special ordinations and even laws. What the word itself really means the most erudite etymologists have never been able to decide; but this point is of less interest than the history of the altar itself, as a part of the temple or church, in all countries and ages. From the edifices of the earlier Christian world most of these monuments have vanished, and especially those of the Byzantine period, destroyed by the Turks at the time when churches were converted into mosques. They were generally, however, as particular relics testify, cubical in form, approached by two steps, and surmounted by canopies supported on four pillars, with, in all Greek examples, an inclosed space in front, such as was prescribed by Solomon, masking all the sanctuary, excepting the altar itself. Here was lavished all possible luxury of painting and gilding; images in solid silver were ranged along the walls, jewelled crosses blazed in the light of silver lamps, and the whole of this splendour culminated in the altar itself. But this magnificence has not descended through all time. To the present day in the royal church of St. Denis, in France, the sepulchre of kings, the altar is composed of an old stone sarcophagus, upheld by a few twisted pillars, and sheltered by a ciborium of primitive simplicity; and it was only the other day that the Municipal Council of St. Gervais, prompted by some modern motive, voted a sum of money for replacing, by certain Nineteenth Century Gothic work, a Greek altar which had stood there from an immemorial epoch, and, possibly, been appropriated from some classic fane. Similar displacements have occurred in the Church of St. Peter, at Corneto, in the altar-tombs of Perugia, and in the canopied altars of St. Clement's, at Rome. With reference to the general subject, however, it has been a traditional question—of what materials should such constructions be made? There is scarcely a substance capable of being manufactured into form which has not been brought into use for this purpose: stone, marble, terra-cotta, wrought and cast iron, wood, carved or covered with gilded copper plates, and others, in an infinite multitude. At Clermont we have a gilded pyramid, rising above a hollow arch of gold, crowded with figures of angels, of animals crouching in the Divine presence, with pillars, castellations, and a hundred other emblematic accessories, in which the entire history of Jerusalem is supposed to be portrayed. There is, clearly, nothing of simplicity, and still less of majesty, in all this. In an apsidal chapel of Amiens Cathedral we have, again, almost a reproduction of the Jewish Tabernacle, as it is described in Deuteronomy, lit up by superb candelabra in ormolu, and certainly suggesting a peculiar Paganism of aspect. The Church of St. Martin d'Ainay, at Lyons, supplies an instance of a different kind. Here, the Holy Table is upheld by two massive columns, each bearing a bas-relief, divided into five compartments, and decorated in the taste of the twelfth century, with straight and spiral flutings, grotesques, and figures, designed, no doubt, to represent Abraham, Melchisedech, and Aaron, with Abel lying dead, and Cain vanishing, as it were, in a vapour. But above this also rises a crenellated tower absurdly surmounted by candelabra. The distinguishing characteristic of this work is the brilliancy it derives from an incrustation of coloured stones and enamels, exuberant, from the step on which the priest first sets his foot to the summit of the wall above the altar-piece. This altar, strangely enough, opens at the back, by means of folding-doors, like a wardrobe, and is employed as a receptacle for the ecclesiastical treasures with which, as a part of the ancient church, it is associated. An altar, similar, yet more simple, though enriched with gold, was presented to the Cathedral of Basle, by the Second Henry, Emperor of Germany, and is now in the Cluny Museum, while another, perfectly different in its characteristics, is to be found in the High Altar of St. Mark, at Venice, designed and executed at Constantinople in the tenth century of the Christian era. To another class belong altars in marble, capable of endless ornamentation, yet, in modern times, never much favoured, as savouring, perhaps, too strongly of the pagan tradition. There are specimens at Angers and Bordeaux, but they are hidden from sight, beneath richly-worked embroideries, so that their sculptures are invisible, except to those who have a purpose in seeing them. But they were less rare in the Middle-Ages, during which period examples of them may frequently be found, especially in the churches of the North. Stone was a material largely employed by the chapel architects of Rouen and Caen—who, in their day and generation, had few rivals, while terra-cotta has been adopted as a material when neither stone nor marble could readily be procured. It became a proverb, once, throughout France, that, in order to build a cathedral, the architect must take a nave from Amiens, a choir from Beauvais, a porch from Rheims, a tower from Chartres, and an altar of burnt earth from the Church of the Red House, at Delay. At Munster, Stuttgardt, Louvain, and Brussels,—throughout, in fact, Brabant and Flanders, and South Germany, altars constructed of wood are frequently found, with cupola-shaped domes above them, while, through the South of France, numbers of these structures, combined of bronze and marble, are to be met with. One of these, of modern date, however, exists in the Church of St. Elizabeth, in the Rue du Temple, Paris. It is supported by eight columns, the intervening spaces being filled up with marble friezes, and bronze medallions. But the style thus illustrated has never been considered to rank high; still less the fashion, even more new, of church altars in wrought or cast iron, a specimen of which disfigures the Parisian Church of St. Eugene, and the Church of the Virgin, at Lyons.

The work, however, to be studied in the Church of St. Martin d'Ainay derives an additional interest from the fact that the edifice was erected on the site of a Roman temple, four pillars recovered from which sustain the centre of its vaulted roof. The altar here is of complicated construction. Its body, so to speak, is of wood, covered with plates of stamped copper, fixed on to it by gilded nails, and is upheld by five iron pillars, also in copper cases, the whole being ornamented in relief by the aid of the hammer and chisel—though some among the decorations were evidently cast by one process or another. But reference has been made to another structure, yet more historical—the Church of St. Denis—shrine of French kings. Beneath that roof existed before the close of the last century, as we have suggested, a number of altars, many of which the iconoclastic spirit of the Revolution swept away. They were nearly all works of the highest art, most of them dating from the age of Saint Louis—when the church itself was almost entirely rebuilt—and each consisting of a table, an altar-piece above, and a niche behind it for the reception of relics. Being invariably detached from the wall, the faithful could thus always pass behind them, and deposit their offerings as they pleased. Columns, supporting candelebra or crosses, stood around, since it was not then a fashion to place lights upon the altar itself. When, half a century later, the fragments of these constructions were dug up from the cellars of St. Denis, it was found that for the most part they were sufficiently preserved to admit of restoration; that they consisted, in the main, of painted stone, enamel, and Castilian cement; that some of them had been mosaicked with fragments of vitrified paste, over gilded surfaces, and that they were composed practically of next to indestructible materials. Singularly enough, the lately-discovered altar in the chapel of the Hospital at Gisors, and that of St. Anne at Loriche, both belonging to the same period, exhibit precisely similar characteristics. In the latter, when an inundation threatened all the rest of the edifice, the altar, secured by enormous metal clamps, stood as if rooted to the ground. There is, however, an altar of a kind very different—a portable one, indeed—which is used in Roman Catholic countries during the procession of the Corpus Christi, though it is occasionally to be met with as a stationary and permanent edifice. This is called "The Altar of Repose," and sometimes assumes a fantastic shape, as that of a throne, a tent, or a triumphal arch, the materials usually being of wood, iron, bronze for ornaments, and tapestry. Historically regarded, however, the variety of materials employed is out of consonance, so far as Christian epochs are referred to, with the general traditions upon the subject. During the first five centuries of our era they were usually constructed of wood; but the Council of Epone, in France, A.D., 509, decreed that, for the future none should be consecrated, except such as were built of stone, whether solid or in the form of a slab supported by pillars, and marked with the stigmata or signs "of the five sacred wounds." Originally, one of these structures sufficed for a church, in later days they were multiplied; each aisle, and, gradually each transept, and ultimately, each chapel had one, though these were often tombs and reliquaries as well. Some communities placed them at the west, others at the east end of their holy edifices, some at both, as was the case in the Saxon Cathedral of Canterbury, and in the church of St. Gall, and is, even now, at Nevers, Mayence on the Rhine, and Falaise. Few of these monumental altars remain in England, the majority of them having been demolished about the middle of the sixteenth century. Queen Mary tried to set them up again, but her successor was inflexible; and yet, notwithstanding the Puritan ravage, a few, with a number of chantry altars, still survive. The high altar of Arundel Church, Sussex, is supposed to be, however, the only one in England remaining in a perfect state. Until lately it was encased in a coating of timber, which may account for its thorough state of preservation. Others, more or less annihilated, are extant at Abbey Dore, Herefordshire; Grosmond, Monmouthshire;

in the chapel of the Pix, at Westminster; at Chipping Norton, Oxon; Warrington, Warwickshire; Bergeworth, near Evesham; Euston, Oxon, Gloucester Cathedral, Christ Church, Hants; Claypole, Lincolnshire; Titchborne, Hants; Wenlock, Shropshire; and elsewere, a good many, no doubt, having escaped the notice of even the most zealous ecclesiologists. Upon the Continent, of course, they flourish as in the olden days, under their various designations as altars "of the Cross," "of the Archangels," "of the Sanctuary," and so forth, and the building of one, for a new cathedral or church, is a distinct matter of emulation among architects. Of course, however, the term, in modern days, bears a totally distinct significance, not in its religious bearing only, from that in which it was employed by the ancients. Thus, there have been just recently discovered, on the site of the antique Eleusis, where so many remarkable excavations have been in progress during several years past, two altars of the purest classic and pagan type, colossal in dimensions, perfectly simple in style, decorated in sculpture with the crossed torches of Ceres and Proserpine, and constructed of the blue-white marble of Hymettus. They are plain, parallelogrammic blocks, standing on plinths, with an unornamented cornice and a flat surface, suited to their sacrificial purpose. Contrast with them the new altars of Nôtre Dame at Paris and of Val de Grace, the latter intended to replace another which was destroyed during the storms of the first Revolution—a composition made up of artificial rocks, glass, painting, terra-cotta, and coloured marble; or, still more effectively, with the celebrated altar, or "tabernacle," as its custodians profess to call it, of St. John, at Flers, with its double glass canopy, its painted pilasters, medallions, fringes and frames of gilt, golden beaten work in sham foliage, and mimic doors in bronze, enwrapped and overpowered by masses of emblazoned upholstery, and, overarching all, a rainbow, tinted after nature. The extraordinary shapes which the imagination of artists and builders, from the most distant epochs, have taken when the erection of an altar was in view, are scarcely conceivable at the present day, in England more especially; but the subject contains its history, with more than an archæological interest attaching to it, nevertheless.

ARCHITECTURE IN THE CITY—NEW AND OLD.

Last week we described a few buildings that have lately been erected in Fleet-street and Cheapside; we now take up one of the many tributaries to this central busy thoroughfare. Chancery-lane is certainly the most important of these: its associations with the inns of court and its historical interest make it eminently one of the few streets in which architectural "improvements" may do more irremediable mischief than good, by destroying some of the vestiges of its antiquity. The first building of any note that strikes us is at the corner of Southampton-buildings, and is ostensibly a large block of offices. It is built entirely of a Suffolk red brick, with tuck-pointed joints relieved by stone dressings and lintels on both fronts, and by windows with white-painted mullions. That which strikes us most in the design is the redundant display of ornament of a rather exaggerated kind, with little or no relief or rest for the eye in the wall surfaces. What is attempted by way of decoration is certainly a specimen of the crudest and most realistic style of carving in brick we have seen. Four panels of brick over the porch are incised to represent large sprigs of daisies, but these are cut to such a disproportionate size, and are rendered in such a formal and naturalistic manner, that they have an intensely grotesque effect, and put one in mind of the sprigs engraved or painted on tawdry fancy wares. They may be emblematic; but even in this case they exceed the limits of all good ornamentation. The front towards Chancery-lane has a flat, circular-cornered bay of two stories, and the angles are emphasised by square piers of brickwork, which are terminated by heavy cappings of stone representing turret roofs. Bands of stone incised with ornament relieve the brickwork at intervals. The elevations are not certainly improved by the huge elliptical-headed windows on the first floor, the arches being filled with stone carved with a small kind of diapered pattern; and having keystones of a rather coarse type. The ground-floor windows are two-light, and have deep stone lintels or heads carved with swags in relief, supported at the ends by small stone corbels enriched on the faces by incised ornament of weak and incongruous design. On the whole, the architectural composition is spoilt by an immoderate use of coarse and incoherent carving and detail—one of the worst and growing faults of modern town architecture, and against which we have repeatedly had to raise our voice. Further down Southampton-buildings, opposite the Birkbeck Bank, we notice another large recently-completed block of offices in white stock brick and stone, in which the proportions and details appal us by their excessive extravagance. The windows have large, coarse, sprawling arches of stone, filled with dark wooden frames with circular heads of intensely meagre proportions, which appear crushed below the arches. The entrances have porches with heavy gables supported on small columns whose capitals are completely overwhelmed by the upper part, while the interior finishings are of the commonest description. Rents are from £20 and upwards, and the offices are central and retired. We cannot avoid contrasting these new buildings with those which surround the old-fashioned trim little court of the adjacent Staple's Inn. How few, we suspect, are acquainted with its precincts! The little green plot of grass, shaded by plane trees, and surrounded on three sides by the old hall and brick houses of the 17th century, has little, perhaps, to interest the regular habitués who are continually passing and repassing, and yet there is a refreshing quiet in the architecture that charms, especially when we compare the modern with the old buildings. The old hall on the north side, with its sombre walls and buttresses of brick, and its mullioned windows enriched with stained glass, reminds us of many other halls of the Inns of Court. Its picturesque features are the square cupola which rises from its roof, covered by a lead capping of Late Gothic character, and a unique doorway which faces the green plat in front, essentially of a Batty Langley type of Gothic, but, for all that, eminently piquant in its way, suggestive of Italian Gothic in its outline and spirit. This doorway, or stuccoed frontispiece, has a gabled termination in two curves crocketed on the top, surmounted by a finial, and on each side is a pilaster, with a kind of pinnacle termination. In the gable there is a quatrefoiled panel, with the initials "T. L. P.," and the date 1753. Adjoining are blocks of red brick buildings, of thoroughly Queen Anne solidity and plainness, but enriched with fine wood modillion cornices and doorheads with the usual scroll pediment. Upon one of the blocks on our right in the doorhead we read the words "Reædificata, Anno Dni 1699, Roberto Browne, Gen. Principali," showing that these houses were rebuilt in that year, and probably supplanted others of even greater pretensions. In the lobbies we observe some capital old balusters and staircases. Passing through a passageway we enter another and larger quadrangle, surrounded by houses of the same character, and with dates over the doorways from 1729 to 1754. The most remarkable features are the doorways, which have well designed cornices with balls over them. Every admirer of old London knows the Holborn entrance to Staple's Inn, with its old gateway its panelled and enriched arch and gates, and the picturesque overhanging stories and gables facing Holborn. These old buildings date from the 16th century, and even now contain mouldings and details of characteristic vigour. The horizontal mouldings which edge the overhanging stories towards Holborn are very bold and effective, and contrast pleasingly with the quaint and picturesque mass of bays and breaks that make up this front, which is entirely constructed of timber rough cast externally. Some of these old courts, if not already doomed, will ultimately give way to improvements; and their architectural character will, we are afraid, grievously suffer if buildings of the modern eclectic school are allowed to encroach upon them under no other artistic control than that supplied by our Metropolitan ædiles.

Let us take another new thoroughfare recently constructed by the Metropolitan Board of Works. It runs parallel to Holborn, and connects Bloomsbury with Clerkenwell. Commencing at the eastern and latter end, we find a large demolition of old and dilapidated premises, the destruction of which must be admitted to be a great sanitary improvement. We pass a begrimed and neglected-looking stock-brick edifice, St. Peter's Italian Church, the tower of which has never been completed, and the lower story of which serves as a belfry for a huge bell that can be seen from the outside. The end is apparently triapsal, but the miserable and squalid surroundings and the removal of adjoining houses give the building the appearance somewhat of a huge unsightly warehouse, and no one could imagine it to be anything else if it were not for the bell and the clerestory. One of the most conspicuous of the new buildings is the Holborn Town-hall, considerably advanced on the south side. The elevation towards Clerkenwell-road consists of a series of seven bays of red-brick and stone, the latter largely used. The building is of three stories. A deep balustrading of stone separates the ground and first stories; the latter have red brick piers slightly broken as pilasters at the openings, above which is another entablature of stone running through the entire façade. The attic story is pierced by a series of circular stone windows, having enriched carved borders divided by piers broken into two small fluted pilasters, with capitals, &c., and the whole effect is quiet and dignified, the recession of the window planes adding a pleasing relief to the fronts. There is a large tower at the angle not yet finished. Messrs. Isaacs and Florence are the architects, and Messrs. Browne and Robinson are the contractors. The return front is somewhat varied, but is carried out in an effective and Classical spirit. At the corner of Theobald's-road, a large block of suites of offices and chambers has been built in stock brick and stone, Italian in style and of mediocre pretensions. Several freehold plots of land are to let on both sides. Close to Green-street a new house called the "Queen's Head" has been erected, remarkable only for a neat treatment of fronts, and some red-brick carved work between the upper windows. A long and shallow plot is to be let on the south side for houses, near Lamb's Conduit, and two very important plots near Red Lion-square, between Theobald's-road and Southampton-row. In Hart-street a large block of shops and offices has been built for letting, the style being in plain Renaissance, with a stone arcaded front to the ground-floor. On the whole, the new thoroughfare is not yet adorned by any work of striking architectural merit, nor do we observe that the lessors have held out any great inducements in this direction.

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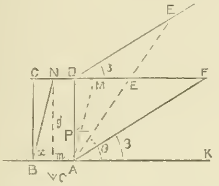
MECHANICS OF RETAINING-WALLS.

OUR attention has been called to this subject by the recent fall of a retaining-wall on the Regent's Canal, adjoining the new Albert-bridge at Gloucester-gate, Regent's Park. On one side of this wall was the tow-path of the canal, and behind it a mass of sloping earth, forming the gardens of the houses in Park Village. The canal at this point has been recently widened, so that a large quantity of earth has been removed near the foundation of the wall, and this circumstance, combined with the heavy rains which have fallen and saturated the soil until it assumed a semi-liquid condition, has probably been the cause of the disaster. Anyhow, it is very evident that the wall did not possess sufficient strength to resist the pressure brought upon it, as it has completely turned over on its outer edge, and fallen right across the tow-path of the canal.

As it frequently becomes the duty of the engineer or architect to construct walls for sustaining the heavy pressure of earthworks, it will not be out of place in this journal if we endeavour to show how this pressure can be estimated, so that we may be able to determine with sufficient accuracy the strength that ought to be given to a retaining-wall. It is evident that the pressure exerted on a vertical wall by a mass of earth will depend very much upon the nature of its composition and the cohesion which exists between its particles. In the case of a solid mass of rock, we have no pressure upon the face of the wall, as the material will stand of itself with a vertical front, and will not tend to thrust outwards. On the opposite extreme we have liquids, as water, which will not maintain a vertical face for an instant without support, and consequently exert the greatest horizontal pressure of all materials that a wall may be called upon to sustain. Between these two extremes we have every possible variety of material, more or less solid or semi-fluid. These, if left to themselves, will always form a sloping surface, inclined at a greater or less angle to the horizon, the inclination being called the "angle of repose" for that particular material. If a quantity of grain, seed, or shot, is thrown down and heaped up on a level floor, it will always be seen to take a certain slope; and it is the same with earth thrown in a loose manner down an embankment, which will gradually spread itself out until its "natural slope" or "angle of repose" is attained. The angle of repose in various materials can only be ascertained by careful experiments on a large scale From these it appears that the most compact earth will stand at an angle of 55° with the horizontal, while fine dry sand takes a slope of 39°, large gravel with loam an angle of 28°, and small gravel one of only 19°. A moderate amount of moisture makes the earth less mobile that when quite dry, and consequently the slope is generally greater for moist than dry soils. When, however, it becomes completely saturated with water, so as to form a kind of quicksand, it assumes the property of a liquid, and will run off at almost any angle of inclination; in which case, it exerts the greatest possible pressure on a retaining wall, especially if there is no proper outlet for draining off the superfluous water.

In order to prevent embankments of earth from spreading beyond a certain boundary, it is necessary to erect walls of sufficient strength from their inherent weight to resist the pressure of earth when filled up against them. These walls should be of uniform solidity throughout, so as to form a solid mass that will not have a tendency to break up into pieces or slide on any of its joints; and for this purpose concrete is undoubtedly the best material that can be employed, unless large blocks of stone can be procured. In these investigations we shall, therefore, assume the wall to be of concrete forming a solid mass throughout, and shall consider the pressure upon one foot length of the wall. As the angle of 30° is about the average for the natural slope of earth, we shall simplify our calculations by adopting this angle in all cases.



Suppose the figure to represent a vertical section through a retaining wall A B C D, at the back of which is a mass of earth the natural slope of which is A F, F A K or β being the "angle of repose." The earth pressing against the vertical plane A D may yield in the direction of any oblique section between A F and A D; suppose it to tend to break off at the line A E, making the unknown angle θ with A K, then we have to determine what value of θ will give the greatest horizontal pressure upon the wall. By the principles of the inclined plane we have the horizontal pressure P, the weight W of the wedge of earth, and the reaction of the plane, all in equilibrium with each other; consequently we have

$$P = W\,.\tan(\theta - \beta)$$

If we take 1 foot length of the wall and put w for the weight of 1 cubic foot of earth, h the height A D, and suppose the earth to be level with the top of the wall as D F, then

$$W = \frac{w}{2} h^2\,.\cot\theta$$

therefore the horizontal pressure P of the wedge of earth against 1 foot length of the wall is

$$P = \frac{w}{2} h^2\,.\cot\theta\,.\tan(\theta - \beta)$$

Now in order to determine when P has its greatest value under the variation of the angle θ, we can put (by rules of trigonometry)

$$\cot\theta\,.\tan(\theta - \beta) = \frac{\sin(2\theta - \beta) - \sin\beta}{\sin(2\theta - \beta) + \sin\beta}$$

which is evidently a maximum when $\sin(2\theta - \beta) = 1$, or when $2\theta - \beta = 90°$, or $\theta = 45° + \frac{\beta}{2}$ and $\theta - \beta = 45° - \frac{\beta}{2}$. Substituting these values in the expression for P, we have

$$P = \frac{w}{2} h^2.\tan^2\left(45° - \frac{\beta}{2}\right)$$

We can now compare this with the pressure produced by a mass of water against the vertical plane A D. By the laws of hydrostatics, we know that the pressure of water on a vertical plane is the weight of a column of water, whose height is the depth of the centre of gravity of the plane, and area of base the surface of the plane. If therefore we call P^1 the horizontal pressure of water whose weight per cubic foot is w^1, we have

$$P^1 = \frac{w^1}{2} h^2$$

$$\therefore P : P^1 :: w\,.\tan^2\left(45° - \frac{\beta}{2}\right) : w^1$$

or the pressure on the wall by the earth may be considered to be the same as that of a fluid mass whose weight per cubic foot is $w.\tan^2\left(45° - \frac{\beta}{2}\right)$. It is also evident that the pressure on the face of the wall increases gradually from the surface downwards being proportional to the pressure height; hence, it follows that the centre of pressure, or point at which P acts, must be at two-thirds the height of the wall below its summit, as in the case of liquids; therefore $AP = \frac{h}{3}$.

We have now to equate the moments of P and of the weight of the wall taken about its outer edge B, and thus determine the thickness A B or t, which will secure it from being overthrown. If G is the total weight of the wall 1ft. in length, p the weight of 1 cubic foot, we have when the wall is rectangular in section as A B C D,

$$G\,.\,Bm = P\,.\,\frac{h}{3}$$

where $G = p.\,h.\,t$ and $Bm = \frac{1}{2}\,t$ from which equation we can determine the value of t that will produce equilibrium between the forces acting on the wall. As, however, the wall in this case will be just on the point of being overturned, and is only kept in its place by the cohesion of its cement, which is too uncertain a quantity to place much reliance upon; it is necessary in order to secure stability that we take our moments about some point x within the outer edge of the wall; let $Bx = 1\text{-}6\,t$, then the equation of stability becomes

$$\frac{pht^2}{3} = \frac{wh^3}{6}.\ \tan^2\left(45° - \frac{\beta}{2}\right)$$

$$\therefore\ t = \sqrt{\frac{w}{2p}}\,.\,h\,.\tan\left(45° - \frac{\beta}{2}\right)$$

Supposing the wall to be of concrete and the earth composed of ordinary gravel having the angle of repose = 30°, we have

$$\frac{w}{p} = \frac{11}{14},\ 45° - \frac{\beta}{2} = 30°,\ \tan 30° = \frac{\sqrt{3}}{3}$$

whence we find $t = \sqrt{\frac{33}{28}}\,.\,\frac{h}{3} = \cdot363\,h$

or the *thickness of the wall* should be *at least one-third of its height* when the surface of the ground is level at the coping of the wall.

If we make N D the thickness of the wall at the coping half what it is at the base, by making the outer face B N to batter inwards, we shall find the centre of gravity of the triangle B C N which is thereby cut off, to be exactly in a vertical line above the point x, about which our moments of stability were taken, consequently the moment of this portion of the wall will be zero, and we shall have the same amount of stability in the wall as before, but we thereby save one-fourth of its masonry without reducing its power of resistance, the centre of gravity g being thrown further back, and therefore the lever arm of G about x increased. If, however, the piece of wall C B N which we took away from the front is added on to the back of the wall as D A M, so as to make it slope at the back parallel to the face, we shall largely increase its power of resistance to the thrust of the earth, and can thereby reduce its thickness very considerably. In this case the moment of G about x becomes

$$G\left(\frac{1}{3} + \frac{1}{4}\right) t = \frac{7}{12}\,pht^2$$

instead of $\frac{1}{3}\,pht^2$ as in the first case, or the moments in the two cases are in the proportion of 7 : 4. Equating this with the moment of P,

$$7\,pt^2 = 2\,wh^2.\tan^2 30°$$

$$\therefore\ t = \sqrt{\frac{6\,w}{7\,p}}\,.\,\frac{h}{3} = \frac{4}{15}\,h = \cdot27\,h$$ very

nearly; so that the thickness of the wall in this case is just three-fourths of what it ought to be when the back is vertical.

We have now to consider the case where the surface of the earth, instead of being level at the coping of the wall, is sloped up at the angle (β) of repose, as D E′. Proceeding in the same manner as before, we take the pressure of a wedge A D E′, and find what angle A E′ makes with A K when the horizontal pressure P is a maximum. W the weight of this wedge is w into the area of the triangle A D E′, or

$$w\,\frac{AD\,.\,DE'}{2}\cos\beta$$

Now, $$\frac{DE'}{AD} = \frac{\cos\theta}{\sin(\theta-\beta)}$$

or, $$DE' = h\,\frac{\cos\theta}{\sin(\theta-\beta)}$$

Therefore, $$W = \frac{wh^2}{2}\,.\,\frac{\cos\theta\,.\,\cos\beta}{\sin(\theta-\beta)}$$

and as before,

$$P = W\,.\,\tan(\theta-\beta) = \frac{wh^2}{2}\,.\,\frac{\cos\theta\,.\,\cos\beta}{\cos(\theta-\beta)}$$

Now it can easily be shown that this quantity is a maximum for the variation of θ when $\theta = \beta$, since θ can never be less than β by the nature of problem. Therefore, we have for the horizontal thrust on the back of the wall

$$P = \frac{wh^2}{2}\cdot\cos^2\beta$$

and this acts as before at one-third of the height above the base A of the wall. Taking moments of the forces P and G about x we have

$$\frac{pht_1^2}{3} = \frac{wh^3}{6}\cdot\cos^2\beta$$

or, $$t_1 = \sqrt{\frac{w}{2p}}\,.\,h\,.\,\cos\beta$$

$$= \sqrt{\frac{33}{28}}\,.\,\frac{h}{2} = \cdot543h$$

when $$\beta = 30^\circ \text{ and } \frac{w}{p} = \frac{11}{14}$$

Comparing the thickness of the wall, when the upper surface of the earth is inclined at the angle of repose, with that which it should have when the surface is level, we have $t_1 : t :: 3 : 2$, so that the thickness with a sloping surface must be half as much again as when the surface is only level, and must be at least equal to half the height of the wall.

The following table of the value of the angle of repose for various kinds of earth, and their weights per cubic foot has been compiled from various experimental data :—

	β	w
Dense and compact earth ..	55° ..	126lb.
Loamy clay and sand ..	54° ..	110 ,,
Common dry earth	45° ..	120 ,,
Dry loose shingle	40° ..	112 ,,
Fine dry sand	40° ..	100 ,,
Dry clay	40° ..	120 ,,
Gravel	27—37° ..	110 ,,
Common sand	22° ..	118 ,,
Wet clay	20° ..	130 ,,
Earth with small gravel ..	18° ..	115 ,,
Water	0° ..	62½ ,,

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SPANISH ART.[*]

THE last art handbook published by the South Kensington authorities has been written by Senor Juan F. Riano, of Madrid, and treats of the industrial arts in Spain. The volume is a valuable addition to the series already brought out, and its author, who edited the catalogue of works of Spanish production in the South Kensington Museum, is an undoubted authority on all objects of Spanish manufacture. The handbook is more descriptive than critical, and comprises the industries of gold and silver work, ironwork, bronzes, arms, furniture, pottery and porcelain, glass, textile fabrics, and ivories. Metal-work is largely treated of, and objects of silver and iron occupy a conspicuous place amongst Spanish productions. The opening chapter on gold and silver-work is crowded with references to actual examples. Of course the jewel work of the Visi-Gothic period is described, such as the treasure of Guarrazar, discovered at a village of that name in 1858. The objects comprise eleven votive crowns of great magnificence, crosses, and fragments of various kinds. Those now to be seen in the Spanish collections at Madrid, and in the Museum of Cluny, Paris, are detailed, and their inscriptions are given. The crowns are considered to have been votive, and were hung before altars, suspended by chains of jewels and other ornaments. The rims of these crowns are especially rich in gems and *cloisonné* work; from the rims are pendants cross-shape, enriched by *cloisonné* and *repoussé* work. The votive crown of King Swinthila, Madrid, is illustrated in the book before us, and exhibits the peculiarities of these very unique specimens of jewellery. The ornamentation found upon them usually consists of circles, and other forms that suggest an Oriental origin, and this view we see is adopted by the author, who says, "The artistic and technical origin of the jewels of Guarrazar must be looked for in the East; their manufacture was most probably Spanish." There can be no doubt whatever in our own mind that the style of ornamentation of these crowns is essentially due to the influence of Eastern civilisation. The Moors, we know, played an important part in Europe during the early period we are speaking of, and influenced art workmanship of all kinds. Referring to the silver chalices of the 11th and 12th centuries, mention is made of the Santo Caliz at Valencia, traditionally held as the cup used by our Saviour at the Last Supper. The author thus describes it: "This chalice consists of a circular cup hollowed out from a fine brown sardonyx, which is tastefully moulded round the lip. The base is formed of another inverted sardonyx. These are united by straps of pure gold. The stem is flanked by handles, which are inlaid with delicate arabesque in black enamel. Oriental pearls are set round the base and stem, which alternate with rubies, sapphires, and emeralds. This chalice is a work of the Roman Imperial epoch, and the mounts are of a later date." A very beautifully enriched triptych in the Cathedral of Seville is a remarkable specimen of Spanish silversmith's work. It is made of wood covered with silver-gilt plates, 22in. high and 39in. wide when opened. It has three leaves. Outside it is divided into twelve medallions, containing the arms of Castille and Arragon. One of the leaves is illustrated, and shows three panels with medallions of geometrical form, the stiles and framing being of 16th century character. The triptych was made by order of Don Alfonso el Tabio, for holding relics. The inside is divided into compartments, and is rich in ornamentation, with capsules covered with rock crystal, containing relics, cameos, &c. We find the author mentions the retablo and baldacchino of the Cathedral of Gerona, and quotes Mr. Street's description of it given in his "Gothic Architecture in Spain." As a most remarkable example of silversmith's work of the 14th century we requote it here:—"The retablo is of wood, entirely covered with silver plates, and divided vertically into three series or niches and canopies; each division has a subject, and a good deal of enamelling is introduced in various parts of the canopies and grounds of the panels. Each panel has a cinquefoiled arch, with a crocketed gablet and pinnacles on either side. The straight line of the top is broken by three niches, which rise in the centre and at either end. In the centre is the Blessed Virgin with our Lord; on the right San Narcisso, and on the left St. Filia. The three tiers of subjects contain figures of saints, subjects from the life of the Blessed Virgin, and subjects from the life of our Lord." The base of the retablo has the words, "Pere Bernec me feci"—Peter Bernec made me. Other beautiful specimens of silver-work are described; but we cannot do more than advise the student of Spanish art to go book in hand to the South Kensington Museum and study for himself some of the beautiful objects there to be seen. He may there see a fine processional cross of 15th century work, covered with *repoussé* in silver-gilt; some fine chalices, &c., in the styles that prevailed at this epoch—namely, Gothic, *plateresque*, in which the details of buildings are combined with profuse decoration — Greco-Roman or Classical. A list of Spanish gold and silver smiths is appended from the 10th to the end of the 18th century.

Spain has been particularly rich in its ironwork; and many of its mines have been worked from the earliest ages. One of the most peculiar and artistic of its manufactures in this metal is that of keys. Some of these are of the most delicate tracery and of Moorish design. They were frequently presented to kings and nobles as symbols of power, or of cities and fortresses. One of the illustrations shows two keys in the shrine of Seville Cathedral. They are both Moorish; one of them is iron and the other silver, with traces of gold and niello work. Cufic letters adorn the wards. Round the handle of the silver key are the Hebrew words "The King of Kings will open, the King of the whole earth will enter." In the wards are the words in Spanish, "God will open; the King will enter." The other key is supposed to have been presented to King Ferdinand, the conqueror of Seville, in 1248. The *rejas* or screens form a most interesting branch of this subject. As the author observes, "the cathedrals and large churches in Spain lent themselves in an admirable manner to the construction of objects of all kinds of ironwork, especially the railings inclosing the side chapels or sepulchres, and the double screens required for the *Capilla Mayor* and *Coro*, owing to the Spanish custom of constructing the choir in the centre of the principal nave of the cathedral." "Rejeros," or ironmasters, occur frequently in early documents, and were on a similar footing as painters and others connected with the buildings. Bartolomé Morey, Juan his son, Maestro Basil, Maestro Juan Francés, are early and well-known names as ironworkers. At the Royal Chapel of Granada is a fine reja dividing the nave, in the "plateresque style." It is of immense size, and is covered with reliefs and figures. The balustrades, &c., are all forged with the hammer, the figures are of large plates, *repoussé* and carved; it dates from about 1520 to 1530. Fine specimens of ironwork exist at the cathedrals of Toledo, Burgos, and Seville, which are fully described by the author; and iron pulpits are not uncommon. Two specimens are mentioned as existing in the cathedral of Avila, hexagonal in form, supported on claws and once gilt, and the reader is referred to Sir D. Wyatt's "Architect's Note-book in Spain." A list of iron masters is furnished at the end of this chapter. It may be mentioned that inlaying iron with gold and silver is still an art industry. It is almost unnecessary to say that arms have always constituted a large field of industry in iron. The author refers to the arms and utensils of pre-historic times; and to those of the Bronze age, but the most beautiful examples of the art are those which partake of Persian character, and the swords, helmets, breast-plates, and shields of Moorish and Milanese manufacture exhibit a wealth of ornamentation truly wonderful. Many specimens are to be seen at South Kensington, and some of these bear inscriptions in Cufic letters. The superiority of the tempered steel is well known, and every one has heard of the excellence of the Toledo blades and daggers. We pass on to the chapter on furniture. The author passes very briefly the Roman or Visi-Gothic period; the Byzantine influence was felt in this, as in other industries in the 8th century, by the excessive richness of decoration. The pulpit, or *minbar*, of the mosque of Cordova is a well-known example unsurpassed in its magnificence. It was constructed of ivory and other choice woods as ebony, sandal, Indian plantain, citron wood, aloe, &c.; it had nine steps, was fastened together by gold and silver nails, was enriched by precious stones, and its construction occupied seven years. The author observes of the 13th century furniture, that it must have been similar to that used in other countries, as it was influenced by French and Italian forms. The Christian and Moorish styles were often blended, and the author cites a reliquary or triptych of large dimensions formerly in the church of the monastery of Piedra, in Aragon. The cornice is said to be adorned with stalactite ornamentation in the Moorish style, and it is divided into compartments ornamented with cusped arches. Another example is a cupboard from Toledo, of the 14th century, to be seen at the Museum, Kensington. It consists of a semicircularly arched recess, the spandrels and tympanum being richly ornamented with folial scrollwork, and Moorish arcades supporting shelves. As in other countries, we find the most noteworthy examples of furniture in Spain to belong to the 15th and 16th centuries, and the Spanish cathedrals are full of beautiful specimens of these periods. Among these are mentioned the choir seats and stalls placed in the middle of the nave. The author observes that the earliest wood carvers probably came from Flanders or Holland, as the style of ornamentation is very Germanic. The choir stalls of Leon are said to be in the purest German Gothic style and most delicately carved. The stalls of Burgos and Barcelona, Toledo, are well-known Late Gothic examples. The *córo* stalls of the last-named place are described by Mr. Street as full of picturesque vigour and character; but the upper stalls are described as "heavy, dull Paganism"—a by no means accurate account of them as fine Renaissance works. The tracery panels and carving of animal life, the bas-reliefs of the Conquest of Granada in the older stalls, are striking examples of woodwork. Cabinets, secretaires, &c., abound during the later periods, and many capital specimens are to be found at Kensington. Some of these are inlaid with ivory, &c.; others are decorated with *pietre duri;* generally a geometrical style of ornamentation is noticed, semi-Moorish in character, and the perforated iron mounts are elaborately wrought. Mention is made of the wall-hangings and the painted and stamped gilt leather "guadameciles" imported by the Moors into Spain, many specimens of which are to be seen in the Kensington Museum. The Baroque style of furniture indulged in excessive and exuberant ornament, which destroyed all the finer qualities of the work, as we find in the overloaded retablos over high altars, &c. In the Palace del Escurial the most costly and delicate inlaid work of the style of Lous XVI. may be seen.

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[*] The Industrial Arts in Spain. By Juan F. Riano. (Chapman and Hall, Piccadilly.)

Ivory carving has a chapter devoted to it, but of this art there are not many well-authenticated Spanish examples. A few excellent boxes of Moorish work of the 10th century are illustrated. Pottery and porcelain make an important chapter in the book before us. Passing the Roman and Visi-Gothic period, we naturally come to the beautiful manufacture known as Hispano-Moresque. The following groups after the Visi-Gothic monarchy is suggested;—1st. Objects imported by the Moors into Spain. These consist of remains of pottery belonging to the first period of their invasion; lustred wares manufactured in the Peninsula, which attained great importance during the Middle Ages, and still continue to be made; terra-cottas and green and white glazed pottery; and lastly tiles of bright colours in the Moorish style. 2nd. Pottery of a distinct Italian style, made at Talavera, and porous unglazed coloured pottery, bucaros, &c. 3rd. Pottery and porcelain made at Alcora and the manufactory of Buen Retiro, near Madrid. During the Middle Ages and Renaissance periods the Moorish style prevailed. The metallic-lustred pottery was established early in the 12th century, and soon attained notoriety. Cordova was the centre of the manufacture, and it is uncertain how much of the perfection of the art is due to Spanish or to Moorish sources. It is certain, however, the Spanish Moors exercised considerable influence on every art from the 8th to the 11th century. The lustred, or gold pottery, reached great perfection in the sixteenth century. According to one account, "five ingredients enter into the composition of the gold colour: copper, which is better the older it is; silver as old as possible; sulphur; red ochre and strong vinegar; which are mixed in the following proportions: of copper, 3oz.; of red ochre, 12oz.; of silver, 1 *peseta* (about a shilling); sulphur, 3oz.; vinegar, 1qt.; 3lb. of the earth or scoriæ which is left after this pottery is painted with the gold-colour is added to the other ingredients." The author says it is now no longer possible to doubt that this pottery came originally from the East, and observes, the comparison between the Persian and Hispano-Moresque wares at Kensington will show the source of artistic culture. The terra-cottas are also described with much fulness. The earliest tiles (*azulejos*) are composed of small pieces let into the wall, forming geometrical patterns, and this tile decoration was extensively employed in Moorish buildings, as in the Palace of the Alhambra, the tiles of which belong to the 14th century. But we take leave of the handbook here, believing it will be found an almost invaluable guide to collectors and connoisseurs in the little-traversed domain of Spanish art.

DECORATIVE WROUGHT IRONWORK.*

MR. D. J. EBBETTS has done service in calling attention to the neglected merits of decorative wrought ironwork, as shown in the remains of the 17th and 18th centuries. In London and its neighbourhood alone some very characteristic and beautiful examples of this handicraft are to be met with, and we observe that Mr. Ebbett has chiefly culled his specimens from this source. His book, published by B. T. Batsford, of High Holborn, comprises 15 photo-lithographic plates containing examples of gates, screens, and other decorative applications, including ironwork from St. Paul's Cathedral, Westminster Abbey, Hampton Court, Carshalton, and Loughton Hall. Some of the specimens contained in the book have been already illustrated in the BUILDING NEWS; we may mention, for instance, those given in our numbers of May 11 and 18, 1877. The author begins with a few very simple illustrations of the gates from the Temple Gardens and Ham House, the former bearing the date of 1730. There is little ornament in the upright bar-work of these gates: in the latter it consists merely of plain scrolls in the horizontal rails; and it is noticed that these rails are widened out and pierced for the vertical bars. We illustrated the former in our first selection of Mr. Ebbetts' sketches. In referring to the specimens we find a difficulty in distinguishing some of them, which might have been avoided if the names of the examples had been written on the plates, or clearly distinguished by letter. For some reason this has not been done in all cases. A few very excellent specimens of wrought-iron gates are given in plates III. and IV., chiefly from Stoke Newington and Holborn. The old porch-gate of St. Sepulchre's Church is admirably simple and graceful in the lines of the scrolled standard and top. The gate shown from Hampstead churchyard shows a more elaborate design, the top being ornamented with foliage. Another characteristic instance is taken from St. Paul's, Covent-garden. Kensington is still rich in old ironwork, and we find one or two specimens illustrated in the work under notice. In the one from Kensington Gore, the whole of the upper panels of gate and standards is filled with scroll ornament, and the head of gate is circular, crowned with scrollwork of much elegance. A very fine gate from Gray's-Inn with date 1723, is given (see illustrations in BUILDING NEWS before referred to), in which the panels have plain upright bars, relieved by simple foliated ends in the centre of each. The standard and ramps are in excellent keeping. Surrey and Essex are well worth exploring for specimens of 17th and 18th century ironwork, and along many of our old suburban roadsides are to be seen some strikingly spirited designs. The gates from old Loughton Hall, Essex (*circa* 1680), though an extremely well-wrought piece of hammered work, is not one we can call good in design. There is a redundant effect in the centre foliations and finials. Plate IX. represents the great gates at Carshalton Park, Surrey, very elaborate, with a rich rail or horizontal band of foliated scrollwork between the upper and lower panels. The author observes in a note, "James Leoni prepared designs, about the year 1723, for erecting a manor house, which was never carried out (see 'Alberti's Architecture,' J. Leoni's edition, vol. 3). The inclosing wall and these gates were probably carried out by him." By far the most dignified and architectural design in the whole collection is the half screen of the entrances to the choir at St. Paul's Cathedral, well known to many of our readers. Mr. Ebbetts' illustration is a very careful drawing. Here the upright bars are placed three together, at intervals, and form pilasters with foliated capitals of the Corinthian order. The bases are scrolled, and the open spaces between these pilasters are filled with very elegantly designed panels. The standards represent pilasters of the same order, over which is an open cornice and cresting of folial ironwork, with urn terminations. Another plate illustrates a portion of the screens dividing the choir aisles from the apse. In this screen the ironwork is of a more elaborate character; there are no upright bars in the panels, which are entirely filled with foliated scrollings, the lower panels being square and of geometrical design. The cresting is of the most elaborate description, crowned by numerous sconces. Other ironwork from St. Paul's is given, but we are sorry the author did not give a portion of the outer iron railing—a very excellent example of design applied to cast ironwork. From Westminster Abbey sketches are given of a few admirable gates and balusters. Plates XIII. and XIV. contain the gates from the garden entrance to Hampton Court Palace, designed, it is stated, by John Tijou, who also designed the Lion gates and the screens, which latter were placed at intervals of 50 yards in the boundary fence separating the Home Park from Hampton Court Gardens. The author says they were designed about 1692, and were executed by Huntingdon Shaw, a native of Nottingham, who died 1710, and is described on his monument at Hampton as "an artist in his way." Rivets are largely used in connecting the scrolls to the framework, the foliage is flush riveted to the stems. The design of the screens, though evincing considerable executive power, is scarcely one we can approve; the foliage, though vigorous and delicate in itself, is too heavy and springs inelegantly from the lower scrollwork of the framing; it is, moreover, involved and straggling, and the whole conception is based on too florid and naturalesque a principle. These screens have now been placed in the South Kensington Museum, two remaining in one of the principal rooms of the grand suite at Hampton Court Palace, and, as specimens of Late 17th century work, with much to admire—as in the panels—and also something to avoid, they are of great value to the student. Mr. Ebbetts' drawings of them are extremely minute and conscientious.

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* Examples of Decorative Wrought Ironwork of the 17th and 18th centuries. By D. J. EBBETTS. London: B. T. Batsford, High Holborn.

A few useful notes are prefixed to the examples. Speaking of the execution of ironwork about the periods described, the author says: "In the 16th century it became usual with smiths to connect the framework of iron panels by means of tenons and mortices; this system was largely extended to the 17th century, and forms the most distinctive characteristic of the work of that and of the following century. Welding was not in much request, although, of course, some clever welding is to be found. Minor panels are sometimes welded into the principal framing; scrolls are nearly always welded together; leaves and husks are generally welded on, though sometimes attached by countersunk rivets, set up carefully, so as to be very difficult of discovery." It is also pointed out that the old smiths were very careful in the selection of their iron: they took care to select iron that could easily be welded even when cold, and Swedish iron was generally selected for the purpose. We take leave of Mr. Ebbetts' "Examples" with the belief that they will be found of service to all architects and ironworkers, as illustrative of the principles that should be observed in the design and execution of ornamental wrought work. However rapid have been our advances in metal-working, especially in the revival of mediæval art, there has been a great lack of real invention in the ordinary wrought ironwork of a decorative character, and that in spite of the many exceedingly light and original specimens of the last two centuries, which Mr. Ebbetts has been one of the first to rescue from an unaccountable neglect. We doubt not that his book and Mr. Penstone's recent remarks will become an incentive to a new effort in this direction.

THE ABBEY CHURCH OF WALTHAM.

THE session of the St. Paul's Ecclesiological Society was concluded on Saturday afternoon by a visit to Waltham Abbey Church. Mr. William Burges, under whose direction the church was restored in 1860, was not present to conduct the party over the edifice, as had been anticipated, but Mr. G. H. Birch pointed out some of the leading features of the church, and read an historical paper and also some extracts from a pamphlet published by Mr. Burges. The fabric, Mr. Birch said, possessed peculiar claims to the notice of ecclesiologists, not only for its own intrinsic beauty, but for its position in the history of Christian architecture in England. Linked as this is for all time to our national history from its connection with Harold and the fatal fight at Hastings or Senlac, this church was long supposed to mark just as important an epoch in architecture, it being contended that this was actually in part built in Harold's time and consecrated in 1062, as shown by the confirmation charter of that date, and a warm strife of tongues had waged about the building. In its origin the church dated from a time previous to Harold, who was a benefactor, and not a founder. In the time of Canute a crucifix possessing miraculous powers was discovered 40 cubits underground at Montacute, in Somersetshire. It was found by the village smith, and was transported, by order of the lord of the manor, one Tovi le Prude, to Waltham, where Tovi founded a church for two priests and other clergy. The manor having become the property of Harold, he enlarged the original foundation to a dean and twelve canons, and rebuilt the church about 1059-60. At the beginning of the 12th century the eastern portion was rebuilt, the old apse being removed and a long choir with aisles and chapels added. About 1177 further alterations were made in the nave, and the north clerestory was rebuilt. In 1242 the Norman choir must have been considerably altered, for Matthew Paris mentions that the church of the canons of Waltham was solemnly dedicated. Some time in the reign of Edward II. a new west end was added, and some important alterations were commenced, which if completed would have entirely remodelled the nave. The vaulting of the aisle at the west end was removed, as it was pushing out the side walls, the nave arch and triforium were thrown into one, and pointed arches were substituted for round ones; but the experiment was found to be so hazardous from the faulty construction that these improvements were not proceeded with. In Edward III.'s time a beautiful Lady Chapel and its crypt were added on the south side of the nave. From the character of the work Mr. Birch remarked that he should have ascribed this work at least to the reign of the previous monarch, but the documentary evidence was too complete. About the same time a large four-light window on north side of nave was altered. No alteration of any magnitude was subsequently made till the Dissolution, except that another (a three-light) window in the north aisle was altered in the Perpendicular style. Till now succeeding centuries had seen nothing but accessions of beauty to Waltham, but afterwards as much trouble was taken to demolish as had been taken to build. The choir, aisles, chapels, and transepts were destroyed, and sold as old materials. During the reign of Philip and Mary the central tower was blown up with gunpowder, and the parishioners having exchanged a bay nag with the proprietor for the materials, built the present western tower, selling the bells and stripping the lead from the Lady Chapel to effect this. According to Mr. Burges, an attempt was made to execute repairs in Charles I.'s time, but owing to Archbishop Laud not having been consulted the scheme fell to the ground. During Charles II.'s reign some repairs were undertaken, including the rebuilding of the second pillar from the east on the south side. In the 18th century, and early in the present century, all sorts of barbarities were inflicted on the church. The roof was lowered, and a plaster ceiling put underneath; more of the windows in the north aisle were destroyed, two galleries were erected at the west end and another in the south aisle, and the whole area was filled with high pews. The present state of the church was due to Mr. Burges, under whose direction it was restored about twenty years since, when the present east end was erected, the galleries and high pews were removed; the low roof was retained, but the plaster ceiling was replaced by boarding painted in imitation of the ceiling at Peterborough, to which a later date was now, however, assigned than at the time this work was undertaken. The subjects are illustrative of the economy of the world, namely, the four elements, the past and future, and the signs of the zodiac, with on either side the labours appropriate to the months. These were painted by Mr. E. J. Poynter, A.R.A. The stained windows were by Powell. Mr. Birch added that it was a debated point whether Harold was really buried here or at Shoreham, or if he escaped to Chester. Mr. Freeman had, after great research, suggested that it was most probable that Harold's body was first hidden under stones on the shore of Sussex, and afterwards removed to his loved minster at Waltham, and a tomb existed till the Dissolution with the inscription, "Hic jacet Haroldus infelix." This was opened by Sir Edward Denny in the latter part of Elizabeth's reign, and was found to contain the "anatomy" of a man. This tomb was probably in the choir, or its eastern extension.

Mr. W. de Grey Birch exhibited a series of casts of the seals of Waltham Abbey, which had been prepared by Mr. Ready, of the British Museum, from documents preserved there. The first was a rude one. The next, dating from the middle of the 13th century, represents Reginald de Maidenhead, but unfortunately the head is gone. In these earlier impressions the seal was ogival, but afterwards it was set in a circular case of silver and gold. In the centre of the seal there was a beautiful gem, apparently of crystal, on which were exquisitely-cut busts of a late Roman emperor and his wife. However, the abbots had not scrupled to ignore the pagan origin, and to place on either side inscriptions declaring one to be Harold and the other Tovi, thus connecting the seal with the founding and enlargement of the abbey. Before the 15th century this falsified gem was cracked, and impressions taken before and after the accident were exhibited, showing the injury. Another pair of impressions shows on the obverse of the seal the arms of England of the period of Edward III. empaling those of the Abbey of Waltham; on the reverse a representation of the Holy Cross of Waltham, supported by two angels, and a Latin jingling distich surrounding it. As to the fate of Harold after the Battle of Hastings, grave doubt had been cast by Mr. Freeman and others on the story of his escape, but he thought some credit should be given to a MS. romance concerning the life of Harold, which exists in the British Museum, and which had never yet been printed in its entirety—a singular fact in this age of publication. This romance was written in the fourteenth century, and its object was to prove that Harold was not buried at Waltham, from whence it had been conjectured that it was written by a monk who had been expelled from this abbey, with the intention of damaging its prestige. It stated that Harold got away, after the battle, to Winchester, where his wounds were dressed, but that great scars remained on his face to his death. On recovering he crossed to the Continent and endeavoured to get the Danes and Saxons to invade England, but, failing in this, he repented of his wickedness towards his country and made a pilgrimage to Palestine, where he collected many relics—of which a long catalogue is given by the writer—for his abbey at Waltham. He returned by way of Rome, but was detected in carrying off other relics without leave and was thrown into prison. On his return to England Harold landed at Dover, and a graphic description is given of his standing on the cliffs and surveying all the country that once he reigned over. Assuming the name of Christianus (a curious accidental prototype of Bunyan's allegory), with a cowl to hide his distorted features, he wandered over the country and settled as a hermit in a cell in Shropshire. Being persecuted by the Welsh in that neighbourhood, he proceeded, in decrepit age, to Chester, and dwelt in the Chapel of St. James, in St. John's churchyard, and there, after many equivocations, he admitted that he is Harold. The last page of the MS., otherwise perfect, is torn away.

A cordial vote of thanks was passed to Messrs. Birch for their papers, and the members proceeded to examine the church. It consists of a doubly-aisled nave of seven bays, of well-developed Norman character. Piers with attached columns alternate with massive circular shafts in supporting the arcade, and of these shafts some are decorated with spiral lines, and others with zigzag ornament, the decoration being continued above the roughly-hewn cushion capitals on the voussoirs of the nave arches. A bold effect is given by the triforium consisting of but a single arch to each bay and open to the aisles; but Mr. Burges has suggested that the usual triplet or fourfold arcades within these arches were removed in the 14th century, and the attached shafts set in pairs on either side of these arches, and slight indications in the masonry seem to bear the theory out. The aisles are of the full height of the two stages. The clerestory is of the usual Norman character, triplets of arches, the centre one being stilted. The quadripartite groining of the aisles has been destroyed in the two western bays, both north and south, in the alterations of the earlier years of the 14th century. In his new east end Mr. Burges has introduced figures from Æsop's Fables in the spandrels of the lancets below the great rose window and in the stringcourse beneath. Mr. G. H. Birch remarked upon the resemblance between the Norman work in this church and the similar fragment of a priory church at St. Bartholomew's, Smithfield. This example at Waltham was stamped with originality, he remarked, by the massive piers and their peculiar ornamentation; the only other instance of like treatment which he remembered was Durham. The church was but a patched and mutilated fragment now, but it deserved the closest study as being one of the noblest specimens of the so-called Norman style in England. The Lady chapel of four bays thrown out at the eastern end of nave on south side was glanced at, its beautiful Late Decorated windows being admired. It is now fitted for use as a parish school. Beneath it is a crypt of coeval date.

But few remains of the domestic buildings of the abbey remain. There is a fine Pointed gateway on the side of the Lea, to the north-west of church, consisting of a large and small arch and a low octagonal tower adjoining, of masonry largely repaired with red bricks. The arch mouldings and labels are well formed, and appear to belong to the same period as the reconstruction of the west end of the church. The old abbey walls extend for a considerable distance, and a few of the members visited a little-known building abutting on the wall considerably to the north-east of the church, within the clergyman's garden. It is laid down in the plan published in the Essex Archæological Society's *Transactions* in 1863 under the commonplace name of "the Potato House," and appears to have been part of the porter's lodge or abbot's house. It consists of a small, low structure of rubble, lying north and south. It is groined in four bays in quadripartite fashion. All the windows have been blocked up, the mouldings and carvings are almost destroyed, the plaster is falling from the vaulting, and it is now used as a vegetable store, but even in its degraded and dilapidated condition the little edifice is a beautiful specimen of the monastic architecture of the latter years of Henry I.'s reign. A singular detail is that there are no neckings to the capitals, the shaft and cap being continued in one piece, and on the same plane. The original level of the floor seems to have been maintained, and if so, it was in all probability not tiled or flagged. Mr. G. H. Birch commented on the beautiful character of the building, and on the fact that the doorway was originally found too low and had been cut away by later occupants of the establishment.

Before leaving the town, some of the members visited the Eleanor Cross[*] on the Herts side of the railway. This beautiful memorial was only too completely restored in the early period of the Gothic revival, but now appears to be neglected. The modern hexagonal railing surrounding it is broken in places, and we noticed with pain that birds have been allowed this spring to build a nest upon the head of one of the three exquisite Eleanor statues—that on the north side facing the London-road. The collection of twigs and straw form an ill-becoming crown to such a gracefully proportioned figure, and it has been necessarily defiled by droppings.

Has no one charge of this, the most perfect of the three Eleanor Crosses yet remaining to us? If there is no person responsible for this neglect, perhaps one of the county archæological associations most nearly concerned, will step in to protect the monument from further injury and pollution.

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THE BRONZES FROM BALLAWAT.

WE have had an opportunity of inspecting the bronze ornaments from the palace gates of Ballawat, near Nimroud, recently deposited in the British Museum by Mr. Rassam. A few of these are exhibited near the entrance to the sculpture gallery, in a central case; but the greater number are being cleansed from the oxides and dust, which rendered them almost illegible. The bronzes are 13 in number, and consist of a series of thin plaques, 6ft. long and 11in. deep, and originally formed a plating to the outer sides of the cedar gates. At the hinge they form a semicircular drum, 14in. diameter. Upon each strip of metal is executed, in *repoussé* work of low relief, two lines of panels, representing battle or hunting scenes, with cuneiform inscriptions at intervals, from which it has been ascertained that they commemorate the victories of Shalmaneser II., who reigned B.C. 850 to 820. One of these bronzes, not yet exhibited, represents the inhabitants of Tyre and Sidon bringing tribute to Shalmaneser. A long procession of priests and laymen are issuing from cities into boats, bearing on their shoulders bars and pigs of gold and silver, and bales of woollen stuff. Further on these are represented as laying their offering before the king, who is attended by his umbrella-bearer, armourer, chief priest, and a bodyguard. Another bronze shows the outset of a military expedition,—the building of pontoon bridges over rivers, wide enough for two-horse chariots to cross, of boats covered with trunks of trees, on which twigs and apparently stones are laid; the attack, besieging, scaling, and firing of a fortified city; spirited battle-scenes, in which cavalry, charioteers, and infantry take part; the impalement and mutilation of prisoners; and on others are shown long lines of prisoners, the men nude, the women in long garments, brought before the king. All the representations of cities show a series of circular columns of one or two orders, finishing in indented ornament like the Eastern crown in heraldry; the compartments between are either left plain with a moulded parapet, or contain large circular-headed doors, the whole resembling a rudely indicated Late Roman building. The camps are either square or round, with tents surrounding that of the king. On one of the siege scenes a six-runged ladder, exactly of the form in common use, is shown planted in a ditch for scaling the town wall. The designs admirably fill the space and are spiritedly executed, the details of dress being indicated by a few strokes of the hammer. The animals are cleverly indicated, the antelopes, Bactrian camels, oxen, and goats being easily distinguished, and perhaps the worst-drawn quadrupeds are the horses, which are all of conventional type and represented in full gallop, even where a chariot wheel has fallen off and the occupants have been spilled. In one of the depictures of pontoon building a superintendent is seated at each end inspecting the delivery and laying of logs and branches, and the chaining up of the boats. The cedar which formed the gates themselves has long since mouldered away, but the thickness and height of the woodwork can be accurately estimated. The plaques have on the upper and lower edges a row of rosettes at short intervals, and through many of these there still pass a series of slender bronze nails with small heads, and about 7in. long. These are uniformly clenched at 3½in. from the head. One of the finds not yet described is a strip of bronze 22ft. long and 3¾in. wide, profusely ornamented on the face with a cuneiform inscription of five rows deep. It evidently formed the stile of one leaf of the gates. The gates were shod with bronze plates (some of these shoes have been brought over by Mr. Rassam), and turned in a stone socket; the strap by which they were probably secured at the top has not yet been identified. We believe that a description of the gates, with autotype illustrations, is shortly to be published by Mr. Stephen Thompson for the Society of Biblical Archæology.

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MISS NORTH'S OIL SKETCHES OF INDIA AND THE ARCHIPELAGO.

MISS NORTH'S collection of oil sketches, now exhibiting at 9, Conduit-street, is well worth a visit by those interested in tropical scenery and plants. The visitor, however, must not expect to find anything especially artistic in the sketches. They are the work of a lady artist who has evidently travelled and observed much, and has depicted what she has seen with evident delight. Every sketch clearly exhibits a hearty pleasure in the work, and nothing has apparently been regarded as too humble for delineation. Foliage, flowers, and fruit are certainly the forte of Miss North, and we rather regret so much ability in delineation in this direction should be overwhelmed by work of a feebler character. The fact is, this lady has done too much; and it would have been better for her reputation as an artist if she had confined her labour to the portraiture of flowers and fruit, and had exhibited only half the number of subjects. Architecture and landscape are to be seen in abundance, but they are unworthy of Miss North's power as a painter of vegetation. As many as 500 sketches are exhibited on the walls in the Conduit-street gallery, and these, though small, are closely packed round the room, almost "killing" one another.

A large map near the entrance shows the route Miss North followed in India. The main line was along the Ganges, Nerbudda, and Jumna rivers, including some of the most noteworthy places in the fertile plain of the Ganges. Delhi, Benares, Bombay, Simla, are among the places touched by Miss North's sketches. Besides Bengal or Central India, we find the west coast traversed from Bombay to Beypore; Madras, and Kandy, and Colombo in Ceylon, were also visited. The forest-trees have been reproduced with much fidelity, together with many beautiful specimens of foliage, fruit, and flowers. Thus we see a careful rendering of the Pandanus or Screwpine, whose roots are visible above the ground, intended to resist the rush of water during the floods in South India. "Seeds of the Sterculia," No. 14, are cleverly painted; so are the flowers and leaves of the forest-trees—the Bohinia, for example, with its delicate double-leaved, pink and white, blossom, and the *P. Acerifolium* (No. 15), with citron-toned leaves. The temple of Tanjore, ascribed by Mr. Fergusson to the 14th Century (No. 8), gives, no doubt, a faithful idea in colour of this splendid example of the South Indian pagoda, "View of Beypore" (11), with its cocoanut trees; the "Cathedral and other Rocks from Matheran" (12); and the view "Sekundra" (20), showing the tomb of Akbar, are all interesting bits of colour, though weak in drawing, and rather crude. The last-named tomb is drawn in rather faulty perspective, like others in the exhibition, though this is a rather excusable blemish in the drawings of lady artists. No. 22 shows some very rich purple flowers of a forest tree. "View of the Doon from Musoori" (26), is one of the best in general effect; oak-trees in the foreground relieve the distance. "The Himalayas from Musoori;" "The Doon" (29); "Deodara Grove at Simla" (38); "Study of Deodara Tree covered with Virginian Creeper" (39), and No. 43, are all conscientious sketches, painstaking in detail. The views of the Himalayas (No. 52) look rather blue in the tints, the colouring is harsh, glaring, and unpleasant, though doubtless Miss North has tried to reproduce faithfully the exceeding clearness and brilliancy due to a tropical atmosphere. "Pink Cactus," &c. (31); the "Lilly of Nynee Tal and Gloxinias" (49), are charming examples of the tropical flora. The least successful portions of Miss North's scenery are the foreground and figures. There is an unpleasing crudeness and unfinish in them, perhaps inseparable in sketches in oil, and these blemishes convince us that water-colour is far the best vehicle to sketch with. "Dargeeling" (58); "Fern Trees," Rangaroon (67); "The Ghauts," Benares (76), are all interesting; "In the Palace," Delhi (81), is unfortunate in its perspective and manipulation, the effect of the pillars and detail is weak and streaky; "Hindu Pillars in the Mosque at the Kutub" (85), is also rather queer in the drawing; the shading and detail are dauby. Various other architectural subjects from Oodipore, Chittore, &c., as Nos. 100, 101, 107, 108, 111, &c., display the most painstaking but misdirected energy. The time spent over some of these sketches must have been considerable. "The Kylas," Ellora (184, &c.); "The River Nassick;" "The Taj Mahal," Agra (199); "Gate at Lahore" (201); and several other sketches testify to the great industry of the artist; but we prefer to examine the variety of trees, and flowering shrubs. Among these we must direct attention to a few wonderful sketches of vegetable life. "The Abyssynian Bamboo," Ceylon (120), is a remarkable tree growing some 60 to 80ft. in height. Miss North's representation of it is admirably drawn. The "Nepenthes or Pitcher Plant of Ceylon" (132), is a sketch equally clever in its delineation of this singular species of plant, which in the swamps of India grow so luxuriantly. Cocoanuts are also represented; the coasts of Ceylon are fringed with these palm-like trees, the wood of which is used for building. We notice also "The Great Nepenthes" (318), from the limestone mountains, Sarawak, and a purple variety; "Tree Ferns" (320), is very natural; so is the "Pink Lotus" (328), and the "Cinchona or Quinine" (329), which grows on lofty mountains. The "Wild Banana" (330); "Banyan Trees" (360), from Java; coffee-berries and flowers, and a variety of other tropical plants are delineated, and the student of botany will find Miss North's drawings in this department very reliable and interesting. The most varied vegetation and umbrageous foliage, from the flora of tropical to that of alpine regions may be seen in these sketches, and the exhibition would have rather gained if there had been fewer of the other subjects. As we have hinted, there is a crudity of colouring and a want of breadth and tone in the landscapes, faults not uncommon in the works of lady artists; but these are somewhat atoned for by the immense labour the collection exhibits, and the fidelity to nature of many of the sketches.

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[*] Illustated in the BUILDING NEWS, Sketchbook series, some years since.

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ILLUSTRATIONS.

DETAILS OF SIR ROBERT COLLIER'S MANSION AT CHELSEA.—MUNICIPAL AND SCHOOL BOARD OFFICES, LEEDS.—ST. HELEN'S CHURCH, WORCESTER.—THE NATIONAL PENNY BANK.

OUR LITHOGRAPHIC ILLUSTRATIONS.

TERRA-COTTA DETAILS—MANSION AT CHELSEA.

This mansion has been erected by the Right Hon. Sir Robert Collier, on the Thames Embankment at Chelsea, and a double-page illustration of the front elevation, sections, and plans was published in the Building News for June 27th last. Mr. R. Phené Spiers, F.R.I.B.A., is the architect from whose designs and under whose superintendence the work has been executed. To-day we are enabled to give a double-page plate of enlarged detail drawings illustrating the chief portions of the rather rich terra-cotta ornamention of the façade. Good details of modern terra-cotta work are not easily met with and so these portions given to-day will be found useful by our readers. We have, from time to time, given similar details of other examples of ornament and construction in this material, such as the series of plates published by us of the new Natural History Museum at Kensington, by Mr. Alfred Waterhouse, A.R.A., and also his Prudential Buildings in Holborn, as well as General Scott's Science Schools at South Kensington. Such a valuable and complete series of details has never been published eslewhere, and the suggestive detail by Mr. Phené Spiers, which we give to-day, can but be appreciated. By reference to the general elevation it will be seen that our illustration to-day includes the ornament to the main pediment, in the centre of which the date of erection is registered in a panel. The pot of flowers in the panel to the left hand of our sheet is from the smaller gable over the library bay. The swag in the centre of our plate, is from the main cornice, and the patera is one of those found in the cornice over the first-floor windows. Some of the designs of these features were included in our first illustration. The remaining detail in to-day's sheet is from the entrance porch, which as a whole is rather different in execution from our smaller drawing. The detail throughout is refined, and has been executed from the careful studies of the architect, Mr. Spiers.

MUNICIPAL OFFICES AND FREE LIBRARY, LEEDS.

These buildings are being erected for the purpose of accommodating a number of departments of the borough business that are now scattered over the town in various localities. When they are finished and occupied, all the departments will be concentrated in the municipal offices and the town hall. The ground floor will contain a large rate office for the receiving of all the borough rates, and gas and water rates, and separate offices for these latter departments. The first floor will be occupied by the borough engineers' offices, and those of the sanitary department, and various offices for rate-collectors, &c., will be placed on the second floor. The basement will contain waiting-room for the sanitary department, lamp-stores, offices for smoke and cab inspectors, house for porter, heating chamber, &c. The free library will also be accommodated in the building, and will occupy the whole of the southern side, except basement. There will be on the ground-floor a general reading-room 80ft. by 40ft., and a women's reading-room. On the first floor the lending library and on the second floor the reference library will be placed. There will also be rooms at the top of the building that may be used for picture galleries and museums. Externally the style adopted is akin to that known as Palladian, but freely treated. The front towards Calverley-street has a projecting centre, in which is the entrance, and at each end a projecting wing, all of them carried up as pavilions with high-pitched roofs and dormer windows. Above the rusticated basement the height is divided into two orders, and a lofty attic surmounted by a balustrade. The orders are Corinthian, the pillars at the entrance being entire and coupled in the thickness of the wall, the others being three-quarter columns and pilasters and between which are placed the windows, round arched and deep sunk. The principal architectural features internally are the entrance hall, which has two rows of marble columns supporting a deeply-coffered waggon vault, the two staircases to offices and to the library separated by an inner hall rising the entire height of the building, with glass roof, and with open arcades to it for admission of light. The general reading-room has also on each side an arcade of semicircular arches in stone, on granite pillars, the ceiling being formed in segment vaults of terra-cotta, of various colours in pattern, carried on wrought iron beams, the haunches being used for flues to extract the foul air from the room. The architect is Mr. George Corson, of Leeds. Mr. James Wood is the contractor for the work up to the ground-floor, and tenders will shortly be invited for the superstructure and finishing.

SCHOOL BOARD OFFICES, LEEDS.

The School Board offices adjoin the municipal offices, and are similar in style but not so lofty. There is a rusticated basement and one story of the Corinthian order, with a lofty attic and balustrade, and a high-pitched roof. The ground floor contains the board-room, committee-room, chief clerk's room, and rooms for the staff of clerks and attendance officers. The upper floor has a large examination room with separate stairs for boys and girls, and architect's offices. The basement is used for storerooms for stationery, books, desks, &c. The architect is Mr. George Corson, of Leeds. Messrs. Wilson and Son have the contract for mason and brickwork; Mr. Britton for woodwork; Watson, Wormald and Co., slaters; Braithwaite, plumbers; Bedford, cast iron; Horsfield, wrought iron beams; Dawson and Nunnely, fire-proof flooring; Payle, carving; Mountain, plasterer; and Wood and Son, painters.

THE CHURCH OF ST. HELEN, WORCESTER.

An interesting church, from the fact of its being the Mother Church of the Diocese of Worcester, the Vicarage of St. Helen being mentioned when the see was first founded in A.D. 680. Since this time more than one church has been erected and destroyed on the site of the present church, no part of which is earlier than end of the 13th century, and all that remains of this being a portion of the south aisle wall as shown in the illustration, the nave arcades and the remainder of the south wall being of the 15th century, the north aisle and east end, the end of the 18th century; the tower (which contains a good peal of bells) at the commencement of the present century, and the east window having been filled with tracery within the last few years. The south aisle wall, which was built at two distinct periods with a red sandstone, had much perished and been further disturbed by the ivy roots which completely penetrated the walls; the mullions and tracery had been largely renewed in cement, and the rain penetrated the wall throughout, and it was found absolutely necessary to remove it. The new aisle wall now building is shown in the accompanying illustration, and is being erected on the old foundations. The remaining works consist of removing plaster ceiling over nave, exposing old oak roof, and re-tiling same, and putting panelled oak ceiling over the two eastern bays for acoustic purposes; re-roofing the north and south aisles, opening out the western arch and throwing the space under tower into the church, and placing the font in same; advancing the choir one bay farther westward, and inclosing same with carved oak screens, with clergy and choir vestries on either side; concreting the whole area of the church, which is full of vaults and graves; reflooring and reseating the whole; laying the chancel with mosaic paving, and heating the church throughout with hot-water; repairing the tower roof, and adding an oak porch to the south door. The seating and oak screens are postponed until sufficient funds are in hand to justify the commencement of this portion of the work. Since the works have been put in hand several portions of the earlier church have been found built into the south wall, and also a plan of the church, dated A.D. 1636, showing the arrangements of the interior of the church at that time to have been similar to those now being carried out. Mr. T. Collins is the contractor, and Mr. Aston Webb, the architect.

PREMISES, VICTORIA-STREET, WESTMINSTER.

This building, which is in course of erection, will contain the head offices of the National Penny Bank, Limited, a residence, five suites of offices, and a set of residential chambers. It is being erected by G. C. T. Bartley, Esq., and several gentlemen interested in the National Penny Bank, especially to suit its requirements, though beyond taking a lease of the part required, that institution undertakes no responsibility, and pays no part of the cost of the building. The irregular form of the site, combined with the varied requirements of the building, presented many difficulties in the planning, which have, however, been overcome with success. The bank is on the ground floor; it consists of an L shaped room, whose extreme dimensions are 70′ 0″ by 30′ 0″; to the rear is a committee-room, top lighted, 20′ 0″ by 16′ 0″; in the basement is a strong room for the books, also store-rooms, lavatory, &c. The porch in the centre gives access to two entrances and staircases, one for a residence; the other for offices and chambers. The materials are red brick and buff terra-cotta with brindled tiles on the roofs. Dennett's arches are used for the fire-proof floors. Mr. H. A. Davis will supply the lifts, viz., a book-lift to the bank, a dinner-lift to the residence, and a passenger-lift, which will serve the offices, chambers, and residence. Messrs. Gibbs and Canning are the terra-cotta manufacturers, Mr. Gamble having prepared the models for the enriched portions. The clerk of the works is Mr. Charles Smith, the builders Messrs. Aitchison and Walker, and the architects Messrs. Heunman and Harrison, of 9, Bedford-row, London. With regard to that portion of the building which is to be used by the National Penny Bank the following facts may be interesting. The first branch was opened at Edgware-road, in October, 1875, and since that time twelve other branches, open every evening, have been established in different parts of London, including the Penny Bank specially erected for the company in Great Eastern-street, Shoreditch.

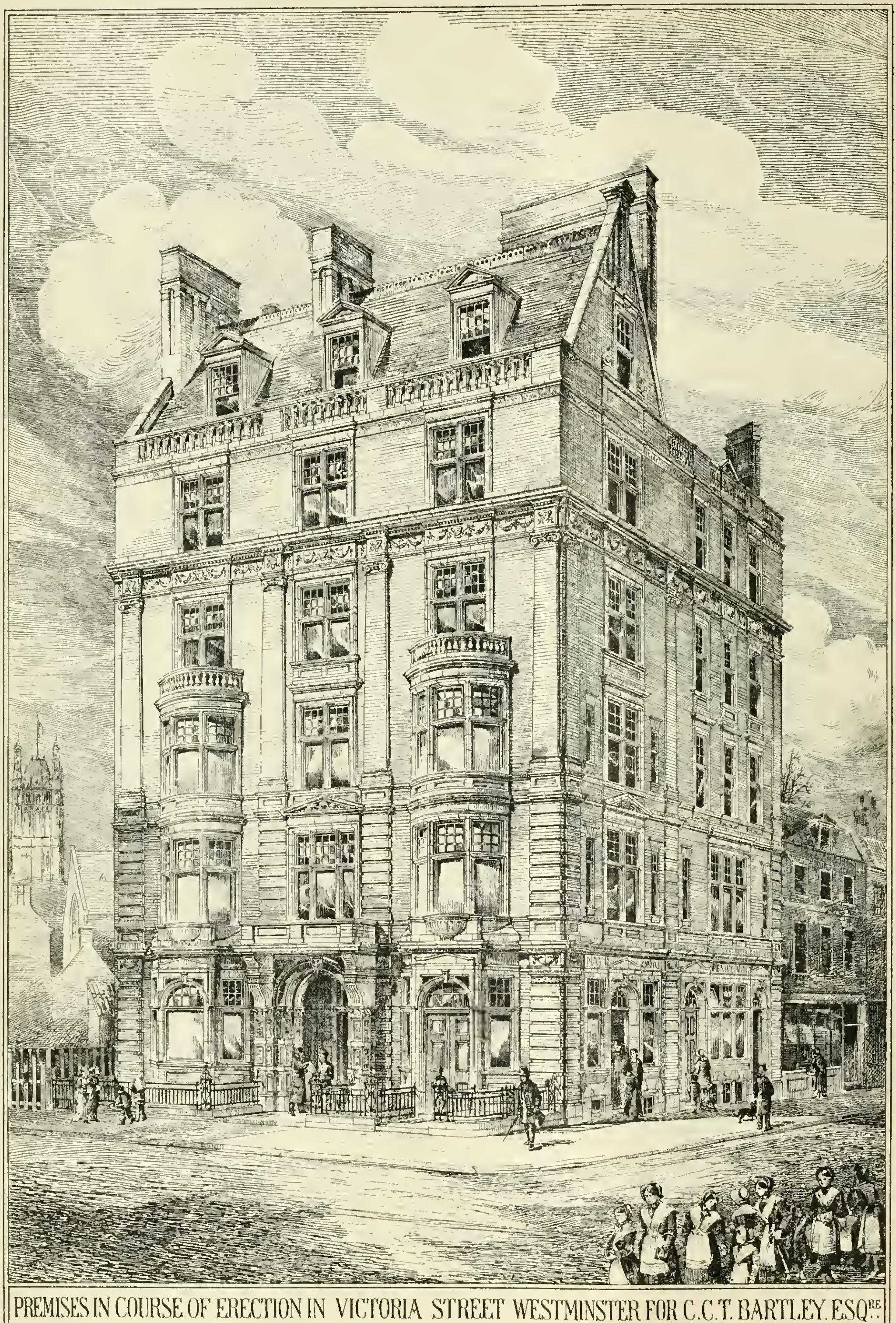
CHIPS.

The foundation-stone of a new mission-hall now being erected by the Evangelisation Society, in Longstone-road, Eastbourne, was recently laid by Mr. T. Brassey, M.P. The contract has been taken by Mr. E. Cornwell, of Eastbourne.

The first portion of the House of St. Anne of the Little Sisters, at Stoke Newington, was blessed by Cardinal Manning on the 23rd ult. The building is a lofty structure in red brick. The architects are Messrs. Goldie and Child, and Messrs. Roberts, of Islington, the builders.

A school-church, costing £1,500, and intended to accommodate 300 worshippers, was opened at Highfield-lane, Keighley, last week. The architect has been Mr. J. P. Bailey, of Keighley, and his design is Gothic.

About 40ft. of the old quay wall on the south side of the East India import docks sunk bodily several feet early on Tuesday morning, carrying with it part of the wool warehouses abutting on the quay. The settlement was caused by the sapping of the foundations by dredging operations, and will cost some thousands of pounds to repair. The quay was constructed in 1806.



PREMISES IN COURSE OF ERECTION IN VICTORIA STREET WESTMINSTER FOR C. C. T. BARTLEY. ESQ^RE.
CONTAINING THE HEAD OFFICE OF THE NATIONAL PENNY BANK (LIMITED). SUITES OF OFFICES, AND RESIDENTIAL CHAMBERS. MESS^RS HENMAN & HARRISON. ARCHITECTS. 9. BEDFORD ROW. LONDON.

W Penstone del.

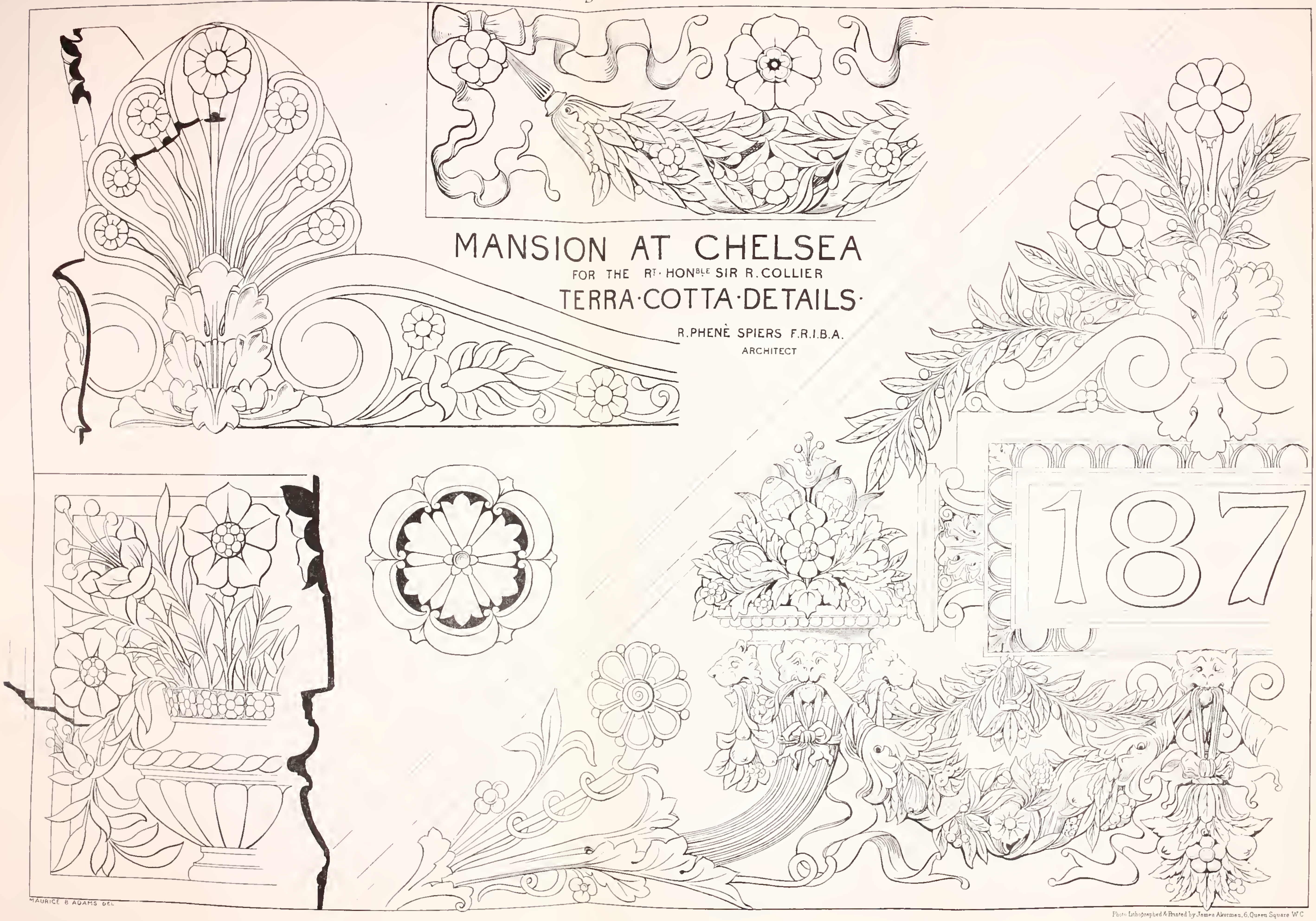
Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

MANSION AT CHELSEA

FOR THE RT. HONBLE SIR R. COLLIER

TERRA·COTTA·DETAILS·

R. PHENÈ SPIERS F.R.I.B.A.
ARCHITECT



MAURICE B ADAMS DEL.

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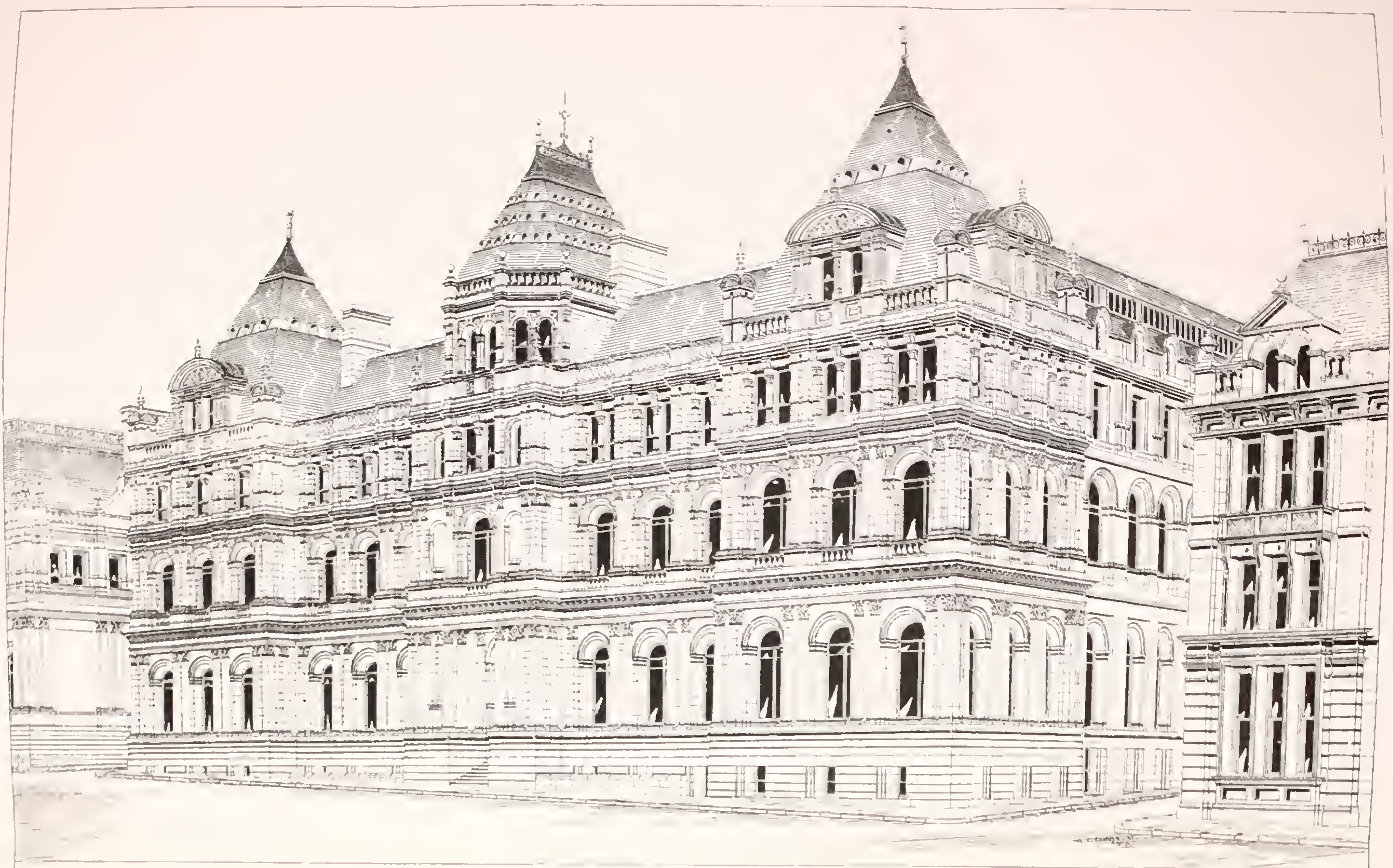
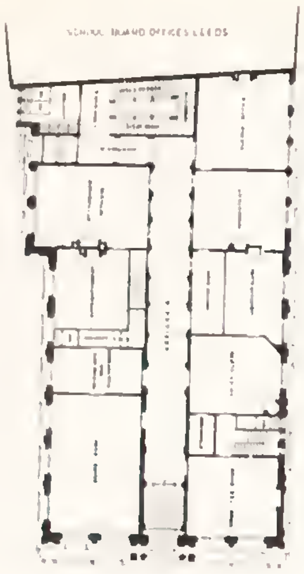
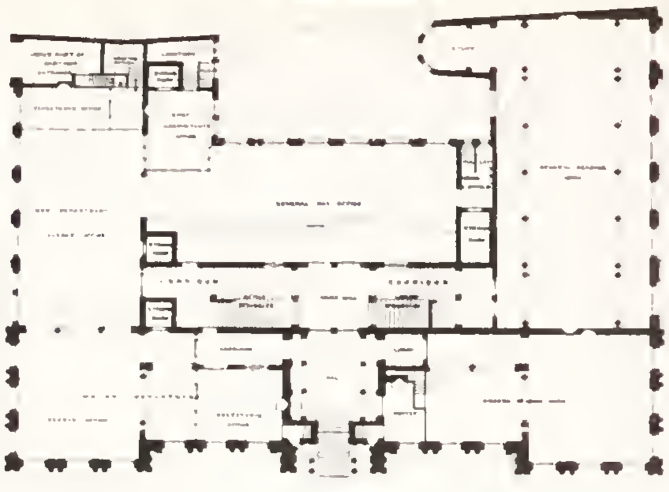


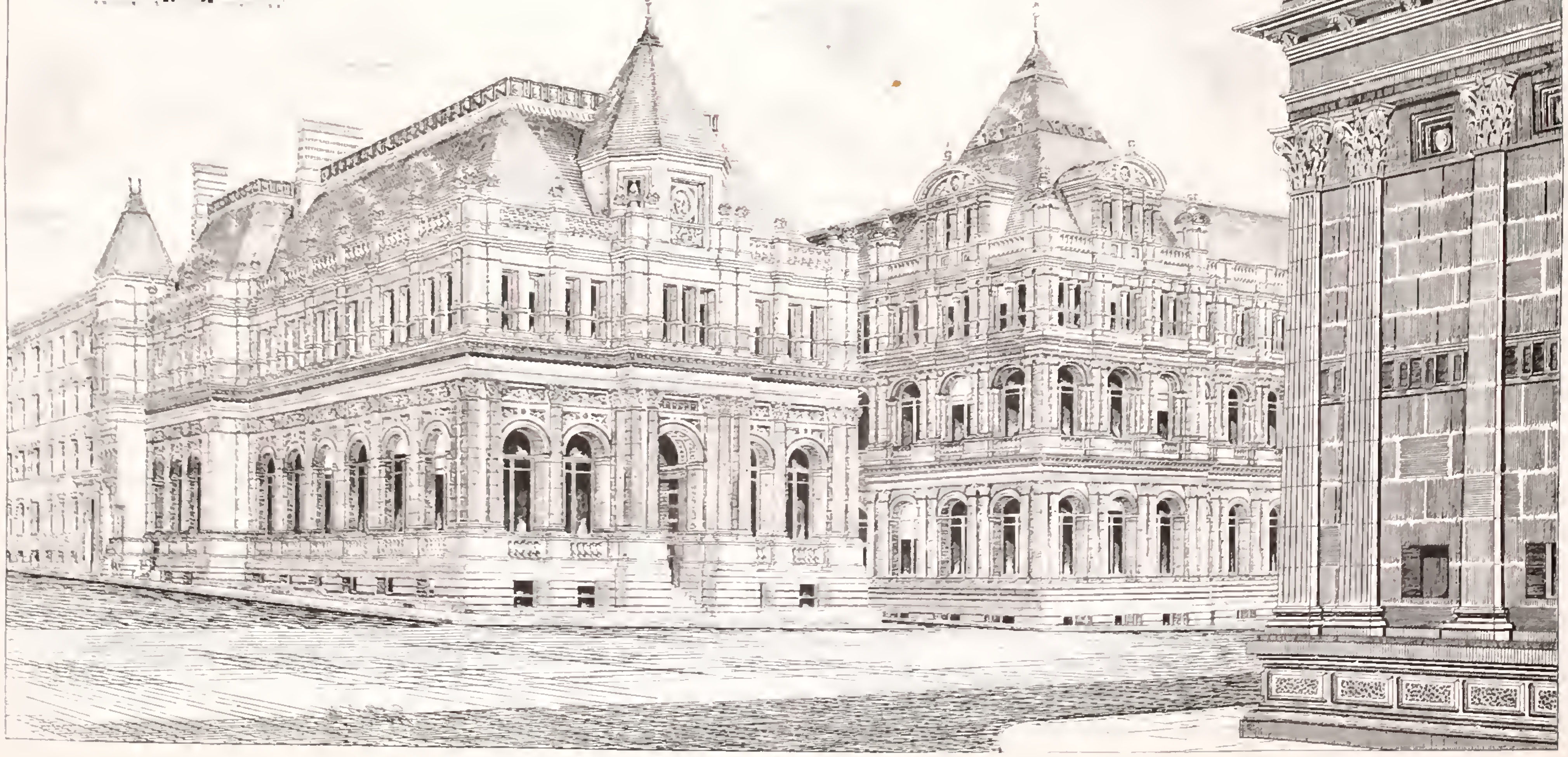
MUNICIPAL & SCHOOL BOARD OFFICES
LEEDS

GEO. CORSON,
ARCHITECT





PLAN OF GROUND FLOOR



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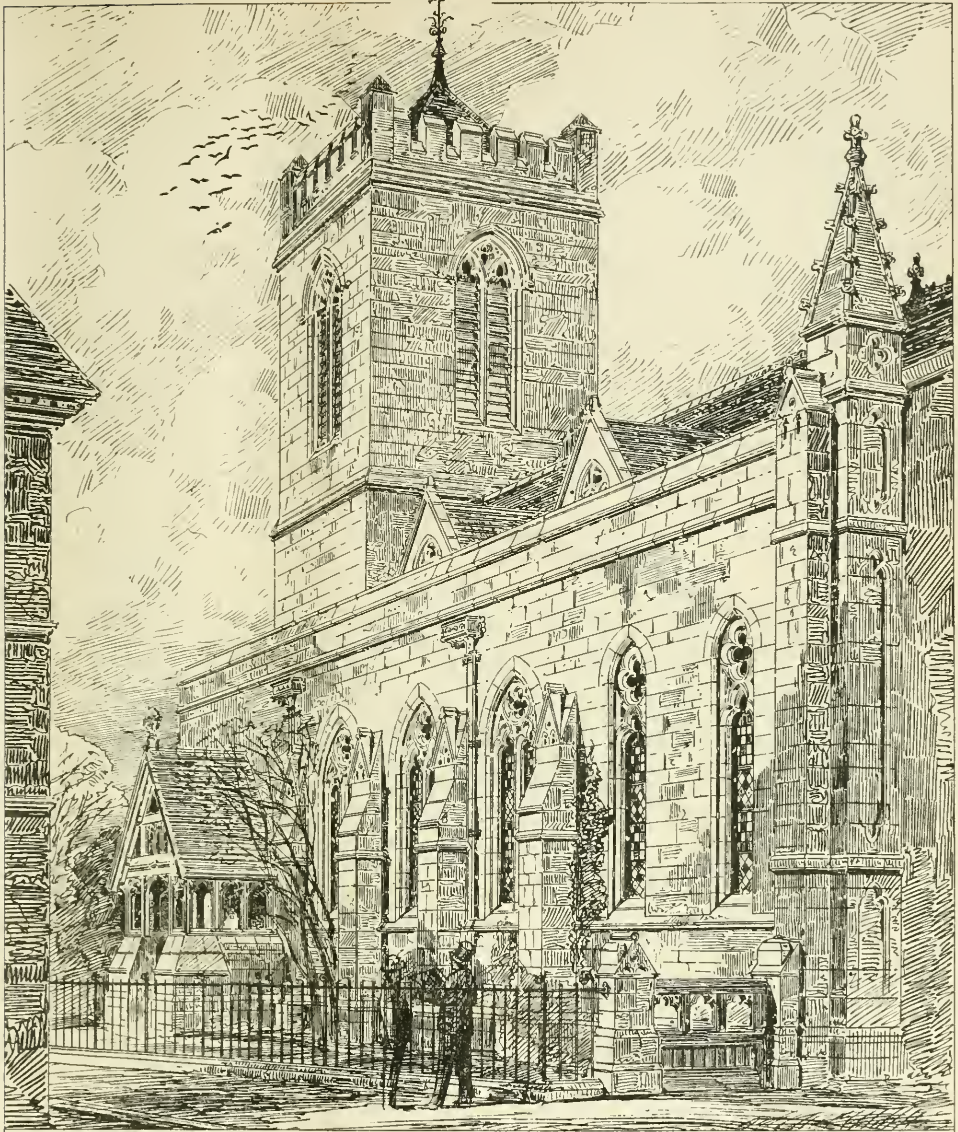
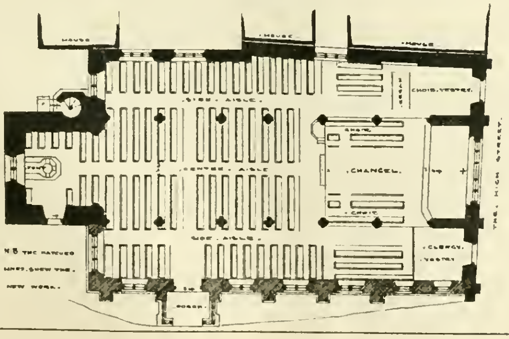
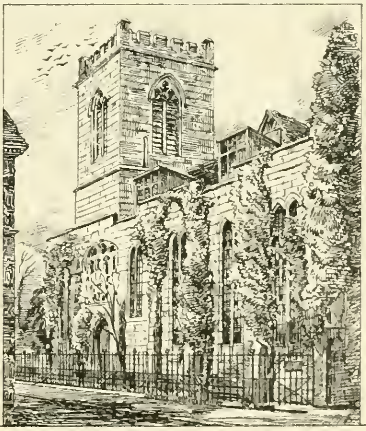


S·Helens Worcester · RESTORED

ASTON WEBB: ARCH^T





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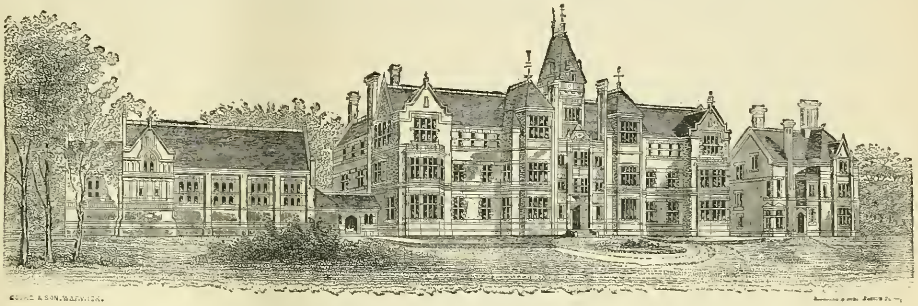
THE KING'S SCHOOL, WARWICK.

In accordance with a recent scheme of the Endowed Schools Commissioners, whereby certain charitable foundations and endowments in the town of Warwick have been combined with the ancient Grammar School of the foundation of King Henry VIII.'s into one trust under the name of the King's New School, the new buildings are opened to-day. The structure, which consists of three separate buildings, with a frontage of 306ft., has been erected on a healthy site of more than 12 acres, about 500 yards from Warwick Castle. The style is Tudor, and the work has been carried out with red brick, Bath stone dressings, and steep tiled roofs, with Ruabon tiles. With boarders and non-boarders accommodation has been provided for 250 pupils. The large school-room is 60ft. by 30ft. wide, and has an open-timbered roof springing from stone corbels. The main dining-hall, which will be fitted up for 120 boys, is 44ft. long by 24ft. wide. There are eight class-rooms, including a chemical laboratory, averaging 25ft. long by 18ft. wide. The chapel is 56ft. long and 25ft. 6in. wide, and is in communication with the main building by means of a cloister. There are two small transepts, and the style is in harmony with the school building. The seats will be lengthways, and will accommodate about 200 persons. The house for the head-master, the Rev. W. F. MacMichael, M.A., consists on the ground-floor of drawing-room, dining-room, and study, together with pantry, kitchen, scullery, &c., and with ten bedrooms above. As in the case of the chapel there is also a means of communication with the school. The bedrooms of the under-masters are so arranged that they can exercise an oversight over the dormitories, which are fitted up on the cubicle principle. The tower of the main building reaches an altitude of 85ft., and the general effect is very imposing. The whole of the work has been executed from the designs of Mr. John Cundall, Leamington. The contractor is Mr. G. F. Smith, Milverton, and the clerk of works, Mr. Timms. The contract price for the chapel was £1,500; the school building, £12,000; and the total cost about £15,000.



THE KING'S NEW SCHOOL, WARWICK.

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PROPOSED ECCLESIASTICAL ART EXHIBITION.

A PRELIMINARY meeting of gentlemen interested in the advancement of ecclesiastical art was held at the offices of the Royal Commissioners for the Exhibition of 1851, 2, Victoria-street, S.W., on Tuesday afternoon, to discuss the advisability of holding an ecclesiastical art exhibition next summer. Mr. J. P. Seddon was, on the motion of Major-Gen. Scott, voted to the chair, and expressed his hearty concurrence in the scheme, which he considered good and feasible, and trusted that it would be taken up by a committee of influence and experience. He read several letters apologising for non-attendance, including one from Dr. Irons which, as he said, contained the *raison d'être* of the movement in the sentence, "ecclesiastical art has long drifted about with but little guidance, and is in danger of making the world fancy that mediæval works are everything." The hon. secretary, Mr. John Bray, explained the aims and objects of the proposed exhibition, which would necessarily be a combination of two totally distinct things: a display of objects worthy of imitation or interesting from their character or history, lent by the owners; and the showing of goods by manufacturers. The first would be the attractive the second the profitable part of the exhibition, but he believed both would be of general interest, and would be productive of good results upon church furniture and decorations in raising the public taste, and giving opportunities for discriminating between artistic and commonplace work. Another class of exhibits, that of original work by architects and artists, would be, he anticipated, an expensive but popular branch, He had received from the council of the Albert Hall a letter, which he read, stating that they would have no objection to grant the use of the building for such an exhibition on receiving assurances that it would be properly carried out and that their conditions of loan would be complied with. A free conversational discussion took place on questions of management, finance, and scope. Mr. Bray having explained in detail the scheme, Mr. Micklethwaite, F.S.A., who succeeded Mr. Seddon in the chair, suggested that the exhibition should not be made exclusively ecclesiastical, but this was opposed by the Rev. Ben. Oliel and others. Mr. Micklethwaite pointed out that the primary point was to obtain the promise of loan of the odds and ends of English Church art scattered over the country, which have never been brought together, and of obtaining for this end the confidence and co-operation of owners of these objects. After a full discussion it was agreed, on the motion of Major Heales, F.S.A., seconded by Mr. Blackburne, to hold an exhibition of ecclesiastical art in the months of May, June, and July of next year, and a provisional council was appointed to work out the details of the scheme, and call an adjourned meeting.

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PROPOSED SANITARY IMPROVEMENTS AT WARRINGTON.

We have received a report by Mr. T. Longdin, borough surveyor of Warrington, on the proposed alterations to be carried out at the Manure Depôt, Longford, the intended scheme for which has been adopted by the Town Council. It appears from the report that the sanitary authorities have for some time had in operation an ash-tub and pail system of collection which, although it has worked fairly well, has not proved satisfactory. For example, it has been found—1st. That the burning of the ashes to reduce bulk and produce fine ash for mixing purposes gives rise to offensive effluvia, which have been complained of. 2nd. Owing to neighbouring towns, which have lately adopted the pail system, competing in the sale of a mixed manure, the sales have decreased; and the price has had to be reduced 25 per cent., notwithstanding which the stock has increased to a large extent, for which no shed accommodation exists. 3rd. In consequence of the manure having to be mixed outside and remaining so long on hand, it loses much of its valuable properties, as the liquid drains away, causes loss of weight, and threatens to become a dangerous nuisance. The total weight of material from ashes, street sweepings, and pail contents during the last twelve months is 11,560 tons. After considering various proposals, the committee have decided to carry out a system that deals with the three classes of refuse promptly, which reduces the bulk and removes all dangerous accumulations. This method, it is believed, will enable the committee to supply a certain proportion of mixed manure as at present just as there is a demand for it, or concentrate the whole to a dry manure. For this purpose the ashes, &c., are to be collected in ash-tubs, which will be discharged on the ground level, and lifted by an elevator and cast into an automatic cinder screen, which will separate the material into fine ash and coarse material; the ash will be shot into a cart, removed, and mixed with such portion of pail contents as will furnish a saleable manure sufficient for local demand; the coarser portion will be discharged at the top of Fryer's patent destructor furnace, which will destroy and reduce any material containing only a small portion of combustible matter. It is almost self-feeding. The heat of combustion will be utilised to generate steam for furnishing the power for working the machinery. Secondly, the street sweepings, including vegetable and animal refuse, will be discharged on ground level, raised by an elevator to a platform, and passed through Fryer's patent carboniser, which will convert the street garbage, &c., into charcoal. This furnace will be heated with a portion of the sifted cinders from the ash-tubs. Thirdly, the pail contents will be emptied on the ground level into a covered tank, and conveyed by a chain pump into an elevated air-tight store tank. Having been mixed with some acid to fix the ammonia, the thicker portion will settle to bottom of tank, and any odour conveyed to the destructor furnace. The thin part is drawn off into two evaporators or cylinders, where the liquid becomes partially concentrated; the contents are then drawn off into the "Firman's Dryer," where it is mixed with the thicker part or sediment of the store-tank. "The pail contents is admitted into the 'Dryer' at the consistency of thin mud; after treatment it emerges as a dry powder, resembling guano in appearance and quality, and realising a price commensurate with the nitrogen and phosphates it contains." The report states that, "on the proposed new system with the quantity of present collections the following will be the saleable product:—

3,200 tons mixed manure,
1,000 ,, sand,
700 ,, charcoal,
290 ,, concentrated manure,

which represents an estimated money value of £2,260." The working expenses of the proposed system will be about £468, showing a decrease of £92 in favour of it; the cost of the old system for the twelve months being £560. One great advantage of the proposed mode of collection and treatment will be, that all offensive gases will be removed, and that sweepings will not have to be carted to "tips." Mr. Longdin's report is accompanied by a plan of the works, and detail drawings of Fryer's Destructor, Boiler, Carboniser, &c., and to those interested in this mode of utilisation will be found of value.

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BUILDERS' BENEVOLENT INSTITUTION.

The thirty-second annual meeting of this institution was held on Thursday week at Willis's Rooms, Mr. Edward Conder, President, in the chair. In the report, read by the secretary, Major Brutton, the committee point out how imperatively necessary it is that new subscribers should be found to take the place of those the institution has lost by death. They, therefore, appeal to all connected with the building interests for their aid in support of the institution. After thanking Mr. Conder "for his generous liberality and energetic efforts" during the year of his presidency, the report states that seven pensioners were elected during the past year, and two widows of pensioners had become entitled to be placed on the list of pensioners under Rule III. Notwithstanding the exceptionally severe winter and the great age of most of the female pensioners, not one of them had succumbed, but the committee regretted to announce that six male pensioners had been cut off, all of them, however, at an advanced age, the youngest being 76 and the oldest 90 years of age. The deceased pensioners had been receiving the benefits of the institution for periods ranging from six to 14 years, the average being 10 years, In conclusion the report announced that the annual dinner will be held at the Freemason's Tavern on Nov. 6th next. The balance-sheet showed a total income of £2,743 14s., including £671 14s. 3d. balance from last year: £794 18s. annual subscriptions, £552 3s. 6d. donations, £80 profits of annual ball, £612 dividends on Consols. The sum paid to pensioners was £1,332 19s., £200 had been devoted to the purchase of Consols, and a balance of £846 10s. 7d. remained at the bankers. The report and balance-sheet were unanimously adopted, on the motion of Mr. Thomas Stirling, seconded by Mr. T. F. Rider, the chairman congratulating the Institution upon the satisfactory nature of the report, and expressing satisfaction that the prevailing depression had not particularly, if at all, affected the building trade. Votes of thanks were given to the president, vice-presidents, and trustees; to the treasurer (Mr. George Plucknett), who was re-elected; to the committee, to the hon. sec. for the ball (Mr. F. W. Keeble), to the hon. auditors (Messrs. J. H. Hunter, J. Cruttenden, and R. J. Ward), who were re-elected; and to the secretary, Major Brutton (on the motion of Mr. G. B. New, seconded by Mr. Jeremiah Long, of Brighton). Mr. F. J. Dove was unanimously elected president for the ensuing year.

INUNDATIONS AND EMBANKMENTS.

At a recent meeting of the French Academy General Morin made an interesting report on the works of Engineer Dausse relative to embankment of the Tiber at Rome. Extending the question, he studied the inundations of large rivers in general, with the best means proposed for preventing their terrible effects. The recent catastrophe which destroyed a populous city in Hungary renders the subject of much public public interest at present.

At Rome, the flood of the Tiber in December, 1870, caused grave disasters. The ever-increasing obstruction of the river exposes to inundation several closely-populated quarters, and the principal public monuments.

An inquiry was set on foot by the Italian Government. The Commissioners thought they must exercise great reserve with reference to the solution of the problem proposed by M. Dausse, viz., deepening of the present bed of the river so as to restore the navigation, at present interrupted. The project of the Government was to keep the river, in its passage through Rome, between quay-walls 18 metres in height, and higher than the level of the neighbouring streets.

Taking up, first, the question of the embankment of rivers, General Morin indicates the inconveniences and dangers of certain arrangements that are thought to be preservative.

A study of the *régime* of great rivers is necessary in order to appreciate the real value and utility of embankments.

In rivers with movable bottoms there are often formed deposits which hinder navigation, not allowing sufficient draught of water. To prevent these deposits dredging is insufficient. According to General Morin, the best arrangement appears to be that which has been adopted in the lower part of the river Po.

Submersible dykes are formed on both banks of the river. The object of these is to protect against average floods the rich and fertile plains which are left in the greater bed of the river, and are called *golenes*. In order that the dykes in question may not prevent the waters of great floods from expanding over the whole width of the greater bed, it is prescribed that their top should be 1·50 metres below the great insubmersible dykes. These dykes, then, have the effect of narrowing the river in times when its waters are low, thus forming a channel, which M. Dausse calls a *duits*. Hence the velocity of the water is increased, having the effect of carrying off sand and gravel that would otherwise be deposited. In the floods of summer the waters of the river spread into the fluvian plains and fertilise them.

Similar dykes to those of the Po were formed on the Moselle in 1835, and by this means navigation is rendered possible between Metz and Frouard. At the mouth of the Somme the Compagnie des Chemins de Fer du Nord, by constructing dykes which have necessitated an expense of 515,000 francs, have succeeded in "conquering" from the ocean and transforming into cultivable land 502 hectares, representing a value of 1,740,000 francs.

The reporter points out, further, that the insubmersible dykes formed on the banks of great watercourses often occasion serious dangers, and he recalled the fact that in 1846 the Italian engineer, Paleocapa, when consulted as to the regularisation of the course of the Theiss, had advised to leave between the dykes an interval of several hundred fathoms. His advice was not listened to; the dykes were constructed on the very banks of the river, and the terrible disaster of the town of Szegedin was the sad consequence.

En résumé, the large dykes should be placed 5 or 6 metres from the border of rivers and streams, so as to furnish to the inundation a space sufficient to extend itself in without danger.

COMPETITIONS.

Beaumaris.—The prize of £10 10s. for the best approved design for an obelisk on a pedestal to be erected on Tower-hill, Beaumaris, as the Bulkeley Memorial, has attracted no less than fifty designs; indeed more than that number have been received. The object of the monument is to serve as a landmark for seamen, and the cost is not to exceed £1,100. The material proposed is Pennon stone. The committee meet at Bangor to consider the plans on Monday next, the 4th inst.

"Owen Jones" Prizes, 1879.—This competion was instituted in 1878 by the Council of the Society of Arts as trustees of the sum of £400, presented to them by the Owen Jones Memorial Committee, being the balance of the subscriptions to that fund, upon trust to expend the interest thereof in prizes to the "Students of the Schools of Art who in annual competition produce the best Designs for Household Furniture, Carpets, Wall-papers, and Hangings, Damask, Chintzes, &c., regulated by the principles laid down by Owen Jones." Each prize consists of a bound copy of Owen Jones' "Principles of Design," a bronze medal, and such a sum of money as the fund admits of. The prizes are awarded on the results of the annual competition of the Science and Art Department. The following is the result of the competition for the present year:—1. T. W. Bradburn, School of Art, Coalbrookdale—Design for a Mosaic. 2. Mary Denley, St. Mary's School of Art, Westminster, S.W.—Design for a carpet. 3. Joseph Castle, School of Art, Grammar School, Manchester—Design for a Chintz.

PARLIAMENTARY NOTES.

East Indian Public Works.—The Parliamentary Committee on East India Public Works presented their report to the House of Commons last week. They recommend that not more than £2,500,000 should be borrowed yearly for public works, and that the loan should be raised in India. They also propose a reduction in the number of pupils at the Cooper's Hill Institute, and a larger employment of natives. We hear, in connection with the Cooper's Hill Institute, that a movement finds favour among those who take an interest in that College to throw it open to the general public, under the joint auspices of the Indian Government and the Institute of Civil Engineers.

The Natural History Museum.—Mr. E. Jenkins complained on Wednesday of the discrepancy between the actual cost of the Natural History Museum, South Kensington, and the original estimate, which, he contended, amounted to a deception on the House.—Mr. B. Hope attributed the cost of this building to the British Museum authorities and the last two Liberal Governments, and Mr. Rylands also spoke on the subject. Mr. Noel denied that there had been any concealment, and explained that the increase had arisen naturally from the rise in prices, &c.

Building Intelligence.

Byker.—The new Board schools at Byker were opened on Monday. They are the fourth set of schools opened by the Newcastle School Board. The schools are erected to accommodate 1,064 children, namely 300 boys, 300 girls, and 464 infants. The architecture is of a simple English Domestic type, with mullioned and transomed windows. At the east end is a tower about 100ft. in height, used for purposes of ventilation. Shafts for extracting air are carried from it to all the rooms; and an upward current will be maintained by the heat from a furnace in the basement. All the external walls are of stone, and the roofs are covered with flat red tiles. The design was by Mr. Johnson, of the firm of Austin, Johnson, and Hicks, Newcastle, who was also the architect for the Snow-street Board School. Messrs. Grey and Humble have been the contractors, and Mr. John Henderson has been clerk of the works. The cost of the site was £1,815; contract, £7,867; furniture and fittings, £647 15s.; architect's commission and other expenses of superintendence, £500; flagging and paving, £500; contingencies and legal expenses, £200.

Driffield.—The foundation and corner-stones were laid on Wednesday week of a new Wesleyan Methodist chapel at Driffield. As the premises around the chapel are shut off from the streets of the town, the architect has confined his attention for external appearance solely to the front, and here he has placed a portico of Ionic design and semi-octagonal in shape, which will be constructed of Whitby stone with fillings-in of pressed red bricks. Internally, the chapel will be 90ft. long, 58ft. wide, and 42ft. high from floor to centre part of ceiling. There will be a gallery all round, 5 seats deep at the sides and pulpit end, and 8 seats deep in the front gallery. The area or space in clear of the gallery fronts will be 54ft. by 29ft. The accommodation will be for 1,187 persons. Transversely the chapel will be divided into 3 widths, as nave and aisles; the nave being 32ft. wide. The organ and choir are to be placed in the gallery behind the pulpit, and there will be a staircase on each side of same, communicating with the side and end galleries and the vestries and class-rooms in rear of the chapel. There will be seven such rooms altogether. Mr. H. J. Paull, F.R.I.B.A., of 9, Montague-street, Russell-square, London, and 1, St. Peter's-square, Manchester, is the architect. The contracts amount to £5,100.

Metropolitan Board of Works.—At the meeting of this board on Friday, the works committee brought up a report, explaining that they are prevented from carrying out the proposed new streets from Tottenham Court-road, to Charing-cross and from Regent-circus to Oxford-street, in consequence of the clause which compels the board to provide house accommodation equal to the number of persons displaced. This, if carried out, it was remarked, would necessitate the lining of the proposed new arterial thoroughfares with double rows of lofty barrack-like workmen's dwellings, to the great and permanent pecuniary loss of the ratepayers. Nothing could be done unless the Act authorising these improvements were amended, so as to release the board from these embarrassing necessities. The report was adopted and ordered to be circulated.

Mile End.—The church of St. Anthony, situate between Globe-road and James-street, Mile End-road, and within five or six minutes' walk of Bethnal Green, was consecrated on Wednesday. The new church is in the style of the early part of the 13th century The architect is Mr. Ewan Christian. The superstructure is of the ordinary yellow stock bricks, dressed with stone, the walls being covered with plaster inside. The extreme length outside is 125ft., and the width 65ft. The nave and chancel are of the same width, and open from end to end without any intervening arch, a dwarf screen wall dividing the raised chancel floor from the nave. A natural slope of the ground upwards from west to east has been followed in laying the floor of the nave. A heavy expenditure had to be incurred in laying the foundations, about £1,400 being spent on work below ground; the superstructure of the church has cost £6,900, exclusive of lighting, heating, and contingent expenses, and the parish-room and class-room have added £1,400 to the expense.

Newton Bromswold.—The parish church of this village was reopened, after restoration, on Wednesday week. The church, which is a small edifice, is in the Perpendicular style, and consists of a nave, north aisle, south porch, and chancel, and a tower and spire. The chancel is of the Perpendicular or Early Decorated period, the nave and the porch being of the Later Perpendicular style. Mr. W. Lewis Baker, architect, of Dane's Inn, London, was some time since instructed to draw up plans, and the work was intrusted to Messrs. Green and Hull, builders and contractors, of Wellingborough, Mr. F. Mayfield being appointed clerk of the works. The necessary alterations and repairs were of a very extensive character. The south wall of the chancel was so much out of the perpendicular that a portion of it had to be taken down and rebuilt. A portion was left standing, in order to preserve the sedilia. The whole of the church has been underpinned from end to end. The buttresses on the north and south sides have been replaced by buttresses of a similar character, but of stronger proportions. The windows of the chancel have been taken out and refixed, and the windows throughout the church have been entirely reglazed. An additional window has been made in the tower. A vestry has been constructed out of what is supposed to have been the chamber of a chantry priest. A new doorway has been made as the entrance to this vestry. The old roof, which was of the Late Perpendicular period, was of oak. It has been taken out and repaired, new portions being added where necessary. The roof of the chancel has also been restored to its original shape; it is of arched deal, with oak ribs. A new tile roof has been made, and a gable cross has been placed at the east end of the chancel roof. The old stone and wood floor has been taken up, and a floor of Maw's tiles substituted.

North London Collegiate School for Girls.—The Prince and Princess of Wales visited St. Pancras on the 18th ult. to open the new building of the North London Collegiate School for Girls in Sandall-road. The lower school was opened 12 months ago, and the upper school on Friday week. It will cost £20,000, including buildings and land, and has been erected from the designs of Mr. E. C. Robins by Messrs. Adamson. It is an adaptation of Queen Anne style. The plan comprises class-rooms for 30, each opening into the central hall. The building is of red brick and stone, with pine dado, a timber roof, and a gallery supported by a colonnade of Mansfield stone piers and arches. Elsewhere are a cooking-school, kitchen, and science lecture-room, music-room, drawing-school and gymnasium. The lower school has cost £20,000, including buildings and land, and the 900 pupils are provided with buildings suitably arranged for higher education at a cost of £35,000, or at the rate of £36 a head. The upper school just opened is an example of the "hall-passage" system, all class-rooms opening directly into the hall. No inconvenience is practically found in working this plan, for the hall and class-rooms are never both engaged at one and the same time. The ventilation is so arranged that the entire cubic space of air-contents can be changed within the hour. We illustrated Mr. Robins' designs on April 27, 1877, and June 21, 1878.

Stock, Essex.—The church of Our Lady of Mount Carmel was opened by Cardinal Manning on the 16th July. It has been built from the designs of Mr. Charles Buckler of Hereford-square, and is Norman in style. It is 46ft. long by 20ft. wide, with semicircular apse, and seats 140 persons. The altar is of white Caen stone, with marble columns and shelves. The reredos consists of three Norman arches with sculptures of Our Lady of Mount Carmel and two adoring angels. The tabernacle, of polished and carved alabaster, with a brass door, is set with jewels and flanked on either side by two columns of red serpentine. The domed canopy rises to the height of 16ft. and has at the corners busts of archangels with gilt emblems and is surmounted by a cross, having on either side an angel with outspread wings. The reredos is semicircular, following the apse. It is of Caen stone, and contains niches supported on columns of red Irish marble within which are incensing angels, while in the spandrels are brilliant spar-jewels, and the whole is finished off by a cornice of highly carved foliage. At either angle of the reredos is a red serpentine pillar, on which is an angel holding an inscribed scroll. The angels, tabernacle, and some of the mouldings are picked out with gold. The roof is barrel-vaulted. All the decorations and sculpture are by Mr. Boulton, of Cheltenham.

Sunderland.—The Sunderland Museum and Library Buildings, which have been in the course of erection since September, 1877, are now rapidly approaching completion, and it is expected that the edifice will be opened about the latter part of this year. The structure is Classic in style, and the principal front is nearly 200ft. long. The elevation of the Borough-road front is ornamented by stone columns, a central dome, and pavilion roofs. The principal entrance under the central dome opens into an entrance hall 48ft. long by 35ft. wide. On the ground floor is the museum, 75ft. long and 35ft. wide, and a curator's room, 20ft. by 15ft. A gallery is formed round the walls of the museum, on a level with the first-floor rooms, and this gallery is reached from the museum by a circular ornamental metal staircase. The contractor for the whole of the masonry work is Mr. Robert Allison, of Whitburn. All the rest of the works have been executed by Messrs. Mackenzie and Moncur, of Edinburgh and Glasgow. Messrs. J. and T. Tillman, of Sunderland, are the architects.

CHIPS.

The Bishop of London consecrated, on Tuesday week, St. Dunstan's Church and vicarage, recently erected in East Acton, on the grounds of Perrin's Charity, by the Goldsmiths' Company. The church is of red brick, and has a nave 75ft. long and chancel 36ft. long; the spire is 136ft. high. The total cost has been £20,000.

The local authority of Manchline, N.B., at a meeting held on Monday decided to proceed with the scheme for draining the whole town immediately, and instructed their engineer, Mr. Pearson, C.E., of Kilmarnock, to take all necessary steps for that purpose.

The Martyrs' Memorial, at Stratford, E., will be inaugurated by the Earl of Shaftesbury, to-morrow (Saturday). Mr. J. Newman, is the architect, and Messrs. H. Johnson & Co., of Ditchling, Sussex, are the contractors. The cost has been about £1,000.

Additional school buildings are about to be erected at Pentyrch, near Cardiff, from the plans and designs of Mr. Evan John, of Pentwyn.

The Torquay Local Board agreed last week to apply to the Local Government Board for sanction to borrow £5,000, for the erection of stables and workshops for the local board in Market-street. The surveyor's estimate of cost of buildings was £1,500.

The new church for the parish of St. Paul, Lincoln, was consecrated on Tuesday by the Bishop of Lincoln. The church has cost £3,630, and was built from the designs of Mr. A. W. Blomfield, M.A., of Montagu-place, W. The contractor was Mr. F. Binns, of Lincoln.

A stained-glass memorial window is about to be erected in Innellan parish church, N.B. It is of three lights, that in the centre representing (John xx. 16)—Our Saviour with Mary in the garden—and the side lights being occupied by figures of Peter and John. The work is being carried out by Messrs. Kier, of Glasgow.

New board schools, erected by the Cardiff School Board at Adamsdown and in South Church-street, were opened by Dr. Vaughan, the new Dean of Llandaff, yesterday (Thursday).

Amongst the papers read at the annual meeting of the Devonshire Association for the Advancement of Science, Literature, and Art, held on Tuesday and Wednesday in last week, may be noted that of the president, Sir Robert Collier, which was a masterly discourse on landscape painting, ancient and modern; and the first report of the Committee on Barrows, which has been appointed to put on record a list and description of all the ancient barrows in the county, with a view to their identification; the latter paper was read by Mr. R. N. Worth, F.G.S.

An art treasures exhibition was opened at Darwen on Thursday, the 24th ult., by the Marquis of Hartington.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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"BUILDING NEWS" DESIGNING CLUB.

Drawings Received. — Boz, Curiose, Peter, Hornet, Boiscan, Sub Silentio, Ich Dien, Osian, Melnotte, Nitor, Naiveté, East Anglian, Spider, Motto J., Ogmore, Burswell, Dalgarno.

Notice.—As the holiday season has arrived, we think it desirable to postpone future subjects till further notice.

Correspondence.

PLANS OF FARM-BUILDINGS AT KILBURN.

To the Editor of the Building News.

Sir,—I must apologise to Mr. Drake for using the same *nom de plume* as he did to his plans.

Mr. Drake assumes that I purposely adopted the *pseudonym*, whereas, the fact is, I looked at the plans alone, and when I wrote my letter could not have told anyone the title of a single assumed signature.

Mr. D. condemns me for my stricture on the plans, *because*, on his assumption, I am one of the "disappointed competitors." He is mistaken in this. I am not an architect, but a practical farmer. I had no hand in either of the plans exhibited, so his brotherly rebuke is inapplicable to me.

With regard to Mr. Waite, who not unnaturally supposes that I am "suffering from a feeling of disappointment so keenly experienced by all the competitors," of course under the circumstances detailed above, I am not an *interested* party, and cannot, therefore, share in the sympathy thus so considerately expressed. I shall defer my answer to his declaimer until I see the photo of his plans. I hope these may be given entire, without amendment.

I take leave to add that I can readily enter into the feelings of those who sent in plans. They were evidently got up at great expense and trouble, and many of them deserved a substantial recognition.

One of the judges, at least, has been engaged as an architect during a long life, and yet he has never succeeded in giving a model plan of farm-buildings. He, or some one else, may now be able to accomplish this feat, after seeing the favoured plans engraved.

It is a very *cheap* method which the Royal Agricultural Society has, under the wings of the *judges*, adopted, by getting the whole scientific architectural world to furnish designs, under a promise of reward. But it is an unmistakable censure on the whole profession, that not one architect in Britain can produce a plan that "combines superior arrangement of details with that economy of cost which is essential." Verily farmers, 'twixt high rents and insufficient stock accommodation, which architects are pronounced (!) not to be capable of providing, seem to be in a fix,—I am, &c.,

Agricola (not Mr. Drake's one).

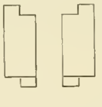
[The letter of "Agricola" was forwarded by an architect well known to us, to whom it had been sent by the writer, and was published for what it was worth. We think the writer ought to have been more careful to avoid assuming the *nom de plume* of one of the competitors, and thus have prevented a misunderstanding which was quite natural under the circumstances. —Ed. Building News.]

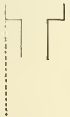
THE CITY COMMON COUNCIL—THEIR ARCHITECTURAL MANNERS AND CUSTOMS.

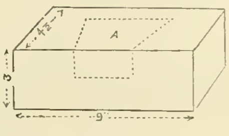
Sir,—It is an old saying that lookers-on see most of the game, and I must say that, as an outsider, I have watched the manner in which the City of London School Competition has been conducted with much interest, though it should be confessed that the game has given me but very little satisfaction. Personally, as an architect, I avoid competitions; my experience having shown me that very little is to be got out of them by men of less than extraordinary ability on the one hand or of unbounded cheek on the other. This having been my rule, I am in no way mixed up with the City of London School Competition, and indeed it is not so much with regard to the competition itself that I would make a few remarks, as the facts brought forward in the speech of the chairman of the committee of the City Schools, reported in last Friday's issue of the Building News, at the Common Council meeting the day before, when the award of the committee was confirmed. The suitability of Mr. Murray, the City architect's chief clerk, to advise the committee in making their award had, as you know, been called in question by those who took part in the competition, so that it was necessary that the position of referee, as held by Mr. Murray, should be defended, and his ability to act in the capacity assigned to him by the Corporation in this instance should be fully established. With a view to this, the chairman of the committee, Mr. Felton, said, "but members ought to know that only a fortnight since the Court adopted, without discussion, the plans prepared by Mr. Murray for the fruit markets, estimated to involve an expenditure of £115,000, whereas the whole outlay on the schools was not to exceed £51,000." Of course, as architects, as ratepayers, and as citizens, we are glad to know these things, even if they cannot be accepted as a proof, either of the technical ability of the Common Council or their architect's chief clerk. Because a man unhesitatingly spends, say, a pound, there is no proof that therefore he is able to outlay ten shillings with profit, and especially is the doubt warranted in the absence of the original goods purchased. This, however, only by the way. Here is the point to which I would draw attention: if Mr. Murray is so able and so competent an architect as the Common Council would have us believe, so able, indeed, that his plans for vast outlays "are passed without discussion," why on earth do the same Common Council, out of the City till, pay Mr. Horace Jones £2,000 a year as City Architect, while his assistant at about £500 a year so satisfactorily does the work? And further, why, if this assistant—and all glory be to him—is so competent to safely spend £115,000 why, when only £50,000 is to be the outlay, put more than 50 architects to the expense of preparing competitive designs for one official only to adjudicate upon, and perhaps carry out the design which he graciously selects? It may save official trouble; but at the least it is a questionable outlay and needless expense, to say nothing of the trouble incurred, by the 50 competitors. If the Assistant is so able what must his superior be? arguing upon the same principle above referred to as brought forward by Mr. Felton. For surely if £500 obtains so much, what endless advantages should be due for the outlay "without discussion" of £2,000? These very fruit and vegetable markets now to be built were the subject of a great competition some few years ago, when, if I remember rightly, three premiums of £300, £200, and £100, and two extra of £50 were paid. What has become of the five selected designs? Have they provided materials on which the passed "without discussion design" was based? Is it a hash up of all five? If not, what a waste of time and money for all parties concerned! And what guarantee has anybody that the City of London Schools won't be built upon much the same *régime*?* The best design for the Farringdon Markets submitted may have been the one selected in the competition, and the one now chosen for the City Schools may be the best of the whole fifty-two designs sent in. If so, then they should be executed under their author's supervision, without further discussion, in the name of all common fairness, and they should not be relegated to this chief assistant of whom we have heard so much. Again, beyond the simple justice due to the authors as an argument against such a relegation of the execution of the work, as is now rumoured, has not the design prepared in the City Architect's office, and bearing the official architect's name, been voted abortive? Indeed this very competition was instituted to make good official insufficiency, to use no stronger term. The City Architect's chair may be well filled, and its occupant well paid, as he should be; for at any rate he is Vice-President of the Royal Institute of British Architects; but architects as a body, and London members of the same Royal Institute in particular, have but little to thank the City of London for—indeed, the debt is all the other way, notwithstanding the fact that all cannot win the prizes in any competition; for the competitors in this instance have every reason to feel that their foolish attentions to the offers of the Common Council have been ill-requited. Perhaps someone can give an answer to my few simple questions. Those in office will scorn my inquiry, and probably treat it with the contempt which, from their point, it deserves.—I am, &c.,

A Ratepayer and Architect.

PARGETTING FLUES.







Sir,—Referring to your issue of the 18th inst., and Mr. Knightley's letter, and your report of the Sanitary Institute therein — Butt-joint *flue linings*, 9in., 10in., 11in., 12in., 15in., 18in. diameter are largely used in the Buckley district, principally for the Irish markets. They are made in 12in. lengths, and from ¾in. to 1½in. in thickness — but there is nothing to prevent them being made other sizes to order and if necessary with socket joints or cut out of the solid, thus; a sort of spigot and faucit; if the socket thus was objectionable in consequence of there not being a straight line here. The difficulty of "the joiner driving in his pegs" would be easily got over, by the use of the dove-tail recessed bricks, patented by Mr. A. A. Johnson, of Birmingham, of which the following is a rough sketch. A is a panel or indent in the brick about half its thickness—dove-tailed towards the back; in this recess is fitted a piece of wood for nailing skirting boards or other fixtures to it, and it can be of course made any size, and on any way of the brick. It cannot draw out like a plug would do, as the greater the pull the tighter it would get.—I am, &c.,

John M. Gibson.

RAMSGATE PROPOSED NEW ROAD.

Sir,—As the Building News has from time to to time given notice of the progress of this competition, and published letters from competitors, &c., I venture to send you a few remarks on the matter, as I understand it now stands. Unfortunately, it appears to have resulted, as I regret to say most competitions do, in a very unsatisfactory conclusion, both to the competitors (excepting of course the premiated) and the Ramsgate people.

You protested at the outset against the appointment of Mr. Abernethy as umpire, on account of his *avowed* professional *interest* in the matter, and the result has proved most clearly that you were right. That gentleman selected three designs as the best, which fitted in best with the railway extension scheme,—as he certainly said he should; but that they were the three best designs, according to the requirements of the town and the stipulations of the printed instructions, no independent judge would for an instant declare.

The inhabitants were perfectly astonished at this extraordinary decision. The designs when exhibited showed that those premiated were positively third-rate—that a score or more among the others were of far greater merit. One would have thought, after this, that we should have heard the last of Mr. Abernethy in this matter; but the commissioners evidently felt that they had got precious little for their 100 guineas, and after selecting 8 designs which they in their ignorance thought were something like what they wanted, asked Mr. Abernethy to let them have a little more for their money, and tell them his views on these eight. Of course it did not suit Mr. Abernethy to admire either of these, so I understand he informed the clerk (vivâ voce only; he would not condescend to give them one pennyworth more in form of a report) that one was too long, another too short, another too dear, and another too cheap, &c. How could he tell with the cursory glances he must have given them (65 designs examined in one week)?

If he had interviewed the authors and got them to go into details, prove their estimates, &c., and he then found their designs were as he said, there might have been some value in his objections; but as he is interested in promoting a scheme that furthers his own projects, how can his criticisms be relied upon?

Anyhow, he has apparently persuaded the commissioners that he knows better than they do what is for their good; that their idea of a front road is a mistake; and that it is another back street they want, with (of course) a railway underneath it, for I find that the latest resolution of the Commissioners is that Mr. Abernethy shall be requested to assist Mr. Cummings (the premiated, whose design was simply laughed at two months ago) in preparing a modification of his (Mr. Cummings') scheme, *i.e.*, something, no doubt that will suit Mr. Abernethy's projects exactly.

Mr. Abernethy is an eminent engineer—possibly of *matter*, he certainly is of *men*—he has engineered the Ramsgate authorities most admirably.

Notwithstanding this extraordinary resolution of the Commissioners, I still have some hope that the decision will never be carried into effect; for I cannot believe it possible that the ratepayers of Ramsgate will ever agree to the construction of this wretched back-street, no good to themselves and no attraction whatever to visitors.—I am, &c.,

A Competitor.

Sir,—We consider that the letter from Mr. V. Green, inserted in your issue of the 25th instant, calls for some notice on our part, particularly as by the omission of the last four words in italics, he entirely perverts the meaning of the following portion of our letter—"We may remark that our design specially includes an arrangement similar to that for the first time suggested by Mr. Green *in the above paragraph.*" If Mr. Green originally contemplated the use of columns, it is strange that his design should not show such an arrangement, and why should he think it necessary to make the suggestion after the

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[* Our correspondent's apprehensions with regard to the execution of the works in connection with the new City of London Schools are unfounded. Messrs. Davis and Emanuel received instructions on Wednesday last to proceed with the working drawings. We are very glad to hear it.—Ed.]

designs have become the subject of criticism (?) such an arrangement actually forming part of one of the rival schemes under reconsideration? The reply is obviously unfavourable to Mr. Green, especially when taken in connection with his indignation that other competitors appear in their *original* designs to have followed somewhat the same line of route as himself.

We think Mr. V. Green will find that we never alluded to his model as a toy; but we may now be permitted to remind him that the great majority of toys are constructed of wood, therefore the statement that he has used such a material is no proof that his model is not a toy, though in common with toys in general, it may have afforded the possessor a certain amount of amusement.

Referring to Mr. Green's statement that the commissioners decided to adopt his scheme, subject to the approval of the railway company, and that Mr. Abernethy with another engineer are to be employed to carry it out; this seems hardly to be the case, strange though the actual decision would appear,—the fact, as stated in another portion of your paper of the same date, appearing to be that no plan submitted in competition has been adopted by the commissioners, but they have suggested that Mr. Abernethy, the arbitrator, in awarding the premiums should meet Mr. Cummins, the author of the "Desideratum" plan, and look into the matter with a view to the preparation of a fresh scheme. Thus if Mr. Abernethy should accept the invitation, it would virtually constitute the arbitrator the engineer to the scheme, which is a position we should scarcely think he would be able to accept. If he did so, it would greatly tend to weaken existing confidence in the fairness of professional awards, even when the arbitrator occupies such a position in the profession as does Mr. Abernethy.

As regards Mr. Green's use of cantilevers, we take his first letter as conclusive on that point, columns only being referred to in such a manner as to imply their entire absence in anything submitted by him in competition, cantilevers *only* being mentioned as the means of support "*of the pavement of Sion Hill, and of the new road opposite thereto.*" It is unnecessary for us to say more on this point, as Mr. Green's intention at the time of executing his drawings is perfectly obvious; and however simple he may think us, we are not quite so simple as to believe that Mr. Green ever intended otherwise than as shown in his drawings, and stated in his letter of the 30th June.

Further, as to his gradients; he admits their impracticability, as he allows that to obtain them the Parliamentary limits would have to be exceeded. The instructions to competitors, in a quotation from the Act, distinctly stating that vertical deviation may be made from the levels defined on the deposited sections, to such an extent as may be necessary, *and not exceeding 7ft.* therefrom. It seems strange, such being the case, that the premiums should have been awarded to schemes which ignore this important condition, whereas it was a serious obstacle to those who, like ourselves, adhered conscientiously to the printed instructions.—We are, &c.,

Via Melior, Iter Brevius.

London, July 28.

DEFILED BATH-ROOMS.

Sir,—I shall be glad if you will allow an outsider to protest against what he thinks an unworthy habit on the part of certain architects—that of placing the water-closet in the bath-room. He noticed a case at Hampstead the other day, where some very fine houses showed this far from refreshing association, which he had not seen before except in certain Scotch hotels and houses. The grouping in the same small room of the sewer and the bath is such a very objectionable plan, that it is to be hoped it is rather owing to an odd sense of fitness on the part of certain architects than to any growing sanitary "notion" of the time. The bare idea of a healthy creature going to enjoy his bath in the same cell (for it is never a room) with a water-closet, one would have thought too strong for the nerves of the present athletic race of architects, who are, no doubt, responsible for the very fine houses in which he saw this plan carried out. Of all countries in the world one would expect to meet a thing of this sort least in England, where people happily have usually strict notions as to cleanliness.—I am, &c., V. R.

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The Bedford Town Council have instructed their surveyor, Mr. Lund, to prepare designs for farm-buildings to be erected on the town's sewage farm.

Intercommunication.

◆

QUESTIONS.

[5846.]—**English Ordnance Map.**—Will some reader kindly inform me when and where the new ordnance map of England, for which the country is now being surveyed, will be ready for publication?—S. P.

[5847.]—**Polishing Floors.**—I have an ordinary deal floor which has been used about 10 years under a carpet, of which I wish to stain dark a border all round the room and wax-polish. Will some of your readers kindly direct me how to proceed?—R.

[5848.]—**Opus Alexandrinum.**—Can any of your readers inform me whether the above floor will bear the wear of nailed boots in a country church, as work under my charge recently laid down on a considerable scale shows signs of already suffering from the effects of the heavily soled feet of the peasantry?—A. W.

[5849.]—**Jewels for Reredos.**—I should be thankful to be informed what are the stones, having the appearance of polished pebbles, which are frequently used let into the stonework of reredos, &c. Also whether they are very expensive, and where to be obtained? Are there any others of different colours (say, red or green) obtainable? If so, what are their names and prices for about 1½in. in diameter?—Augustine.

[5850.]—**Coating for Barge Boards.**—Can any of your readers inform me in what proportion pitch, tar, and linseed oil should be boiled together as a coating for barge boards and exposed timbers in half-timbered buildings, and whether any better black mixture could be used?—Half Timber.

[5851.]—**Builder's Tenders.**—If the tender of a builder for alterations to a building is not accepted, can he claim compensation for his trouble, and charge for drawings supplied (the drawings not being asked for)? If so, what should be the rate of charge? The opinion of the readers of the Building News will oblige—A Young Builder.

[5852.]—**Yorkshire Tour.**—Contemplating a visit to the North Riding of Yorkshire and South Durham, I would esteem it a great favour if any brother reader would kindly sketch out a few days' tour, including such places that would be of architectural interest, thereby greatly adding to the enjoyment of a—Constant Subscriber.

[5853.]—**Extras.**—Will some kind reader give me information as to best manner of acquiring the proper and most business-like manner to make out a "bill of extras"? A reply from "G. H. G." would be considered a great favour.—Edwards.

[5854.]—**Railway Bridges.**—Will any reader kindly inform me, through the medium of the "Intercommunication," the factor of safety used in calculating strains on wrought-iron girders for railway bridges, over which heavy loads are continually running?—Pupil.

REPLIES.

[5773.]—**Lime.**—I am glad to see Henry Ambrose has retracted his statement that "poor limes contain no alumina," and now allows the poor limes to do so. This being the case, and H. A. having been unable to give a single analysis of a poor lime devoid of alumina, I do not think a "tabulated account" of my analyses, which all contain that substance, could be of any service. Analyses of poor limes containing alumina have been frequently published, and are familiar to all who have studied the subject. H. A. devotes much space to disproving an assertion of his own—namely, that one of the gaseous constituents of the atmosphere must be the cause of the deterioration of chalk lime in exposed situations. Unfortunately, in his summary of the constituents of the atmosphere, H. A. has omitted the very one which is really injurious to rich limes—namely, liquid water. No one who has resided in England during the last few months will deny that water in the liquid form sometimes occurs in considerable quantity in our atmosphere. It is, I think, equally undeniable that mortars made of rich limes are more or less disintegrated by liquid water; were this not the case, such limes would be hydraulic. H. A. ignores the fact that thousands of tons of chalk lime are used in London for work exposed to the gaseous constituents of the atmosphere, but without injurious result if they are not exposed to liquid water. H. A. quotes from a textbook on chemistry a well-known reaction of carbonic acid, in order to prove that this gas softens lime mortar. The reaction proves, however, exactly the reverse, for I am sure H. A. will admit that the solid carbonate of lime produced by the action of carbonic acid upon lime water is harder than the liquid lime water from which it originates. That carbonic acid is of great importance in the hardening of rich lime mortars is the opinion of those who have devoted more attention to the subject than H. A. seems to have done may be seen from the following quotations: L. J. Vicat, in his "Treatise on Calcareous Mortars and Cements," states, with reference to hydraulic limes, "The carbonic acid augments their hardness also, but never to such a degree as to raise it to an equality with that which it gives to the hydrates of the rich and white lime." 2. A. Gilmore, in his "Practical Treatise on Limes, Hydraulic Cements, and Mortars," says: "We have indicated that the hardening of fat lime mortars could be partially attributed to the absorption of carbonic acid gas producing carbonate of lime ($CaOCO_2$)." If these quotations should not suffice to alter H. A.'s opinion on the subject I shall be glad to furnish him with others.—Walter F. Reid.

[5787.]—**Strains on Collar Beam Roofs.**—Thoroughly agreeing as I do with Henry Ambrose that it is "an imperative duty not to mislead young beginners into erroneous notions on such important questions as safe roofs," I feel bound to point out where he is himself at fault. He is perfectly right in stating that collars can be brought into tension, but they ought never to be designed as ties unless the sum of the resistances of the rafters to bending and of the walls to overturning is far in excess of the forces tending to bend, and so to spread the feet of the rafters. The iron roof he quotes is not a case in point, since the principals are specially trussed to prevent their bending, but with ordinary collar beam roofs the collars, if intended to act as ties, should be placed as low down as possible, and the rafter should not be cut into in forming the joint with the collar, as all its strength is required at that point to prevent bending. In spans, say over 12ft., collars are required with ordinary rafters to prevent their sagging, their best position for that purpose being half way up, where they keep the centres of the rafters apart and should be in compression, for if in such a case they come into tension it is only owing to the spreading of their feet, which, should the wall plates remain firm, means pushing out the walls, a result which is highly undesirable, though one of very common occurrence, owing to the prevailing ignorance as to the part the collar plays under different conditions. There is no reason why tables of safe scantlings for ordinary collar beam roofs should not be given in architectural handbooks, showing what walls may be reckoned upon as capable of resisting the thrust of the rafters when the collars are in the limiting position of half way up. Henry Ambrose should first consider a roof of, say, 18ft. span, with 4 × 2 rafters, and collars half way up, the feet of the rafters being tied together. It is manifest in that case that the collar is in compression. Now remove the tie, and if the walls are not capable of supplying by thrust the work before done by the tie, they must yield to the thrust of the rafters, for calculation will show that the transverse strength of the rafters is incapable of transferring the work previously done by the tie to the collar. Let him, then, lower the collar till he finds that it can take up the tension without the feet of the rafters spreading, and he will find that it has come down so far that the rafters, in order to prevent their sagging, require an additional collar half way between the ridge and the lower collar, now acting as a tie. The original question put by "S." will have done much good if it induces some one, who has both the time and knowledge at command, to put this subject on a clearer basis than that on which it has hitherto stood. It is glanced at in Stoney's "Theory of Strains," p. 154–6, but not sufficiently from the practical carpenter's point of view.—H. C. S.

[5787.]—**Strains on Collar Beam Roof.**—Your prolific contributor, "Henry Ambrose," though very justly remarking that a collar above the foot of rafters is in tension, has neglected to take into account the case of a collar when a tie beam is below it. In this case, the collar acts as a strut, keeping apart the rafters. There is another condition also to consider which the rigid rafter theory, to coin a phrase, does not consider. Suppose a span roof with a collar but no tie beam, and the rafters of smal scanting, what happens? Everyone knows that the rafters of such a roof sag or deflect. This is partly due to thrust, but not entirely. The load on the rafters acting vertically downwards can be resolved into a force operating to bend the rafter. In the case of wind another force comes into play, productive of the same effect. It will thus appear that there is more than the horizontal opponent or thrust due to weight, and "S.," no doubt, had in mind such a case. In a roof with a simple collar as a tie, it is obvious the greatest strain is at the points of junction of the collar with the rafters, and we can conceive a roof of this construction so loaded as to break at the connection. the tendency being to cause the lower ends of rafters to push out the walls. A collar is only of value when the rafters are sufficiently deep to resist cross bending. As a strut I do not think it is of much use, as its action cannot be direct.—G. H. G.

[5787.]—**Strains on Collar Beam Roofs.**—Diagram 1, given by H. Ambrose in the last number of the Building News, is by no means a common mode of failure in a common roof, and I have seldom observed any other tendency than the common sagging of the rafters, due of course to the resistance of the collar or tie, and the weight of roof, as in Fig 3. Fig. 2 illustrates the case I mentioned last week, but which I see has not appeared in the issue of the 25th.—G. H. G.

[5803.]—**Proportion in Church Architecture.**—I have been much interested in the correspondence on this subject, and join "Perplexed Student" in thanks for the valued particulars supplied. It has occurred to me that mention might now be made of a system or theory of angular proportion, propounded some years since by a Mr. Hay, of Edinburgh, as something that, while not losing sight of or departing from the rules already given, might be turned to account by "Student" as collaterally useful. Mr. Hay held that the eye was pleased with simple proportions, that no satisfactory rule of linear proportion had been discovered, and that angular proportion was worthy of consideration, as the eye estimated proportion by direction rather than by distance. To illustrate in a simple way what is meant, Mr. H., in one of his treatises, says that a picture frame, one of whose sides is twice the length of the other, is not of such pleasing proportions as one in which the angle contained between the diagonal and one side is equal to half the angle contained between the diagonal and the side or end at right angles to the first. Mr. Hay, in testing the measured dimensions of the Parthenon at Athens by his system of angles, found the two to approximate very closely, so that in the whole height of the Parthenon there was only a discrepancy of 6in. If I remember rightly, the line struck from the outside of angle column at its base on one side to outside of angle column on the opposite side of the building at top of column, where it met the architrave, formed an angle of 30° with the base line, or one-third of a right angle. The diagonal line from top to bottom of columns made an angle of one-ninth with the perpendicular, and the intercolumniations an angle of one-seventh. In Lincoln Cathedral, taking the apex of main gable of east end as a point of departure, the inner edges of main buttresses, where they cut the base line (not taking account of mouldings) make an angle of one-twelfth with the perpendicular. The outer edge of same buttresses an angle of one-tenth, the inner edge at base of corner buttresses angle of one-fifth, and the outer edge of same an angle of two-ninths nearly. In this cathedral the height being determined, an angle of one-half of a right angle, from the centre at base, meeting a line from the apex, drawn at an angle of one-third from the vertical, determines the outside extreme width exclusive of side buttresses. I have sent the above particulars, as I have not seen any reference to this particular method of using what Mr. Hay was pleased to call harmonic angles. This gentleman reckoned that an angle, which was a multiple or sub-multiple of another, would be in harmony with it, as the slope of the buttress pediments at Lincoln being at an angle of one-seventh, the slope of the pinnacles above was one-fourteenth of a right angle. It is impossible in a short note to go fully into this matter. I do not remember the publisher of Mr. Hay's treatises, but possibly "Perplexed Student," if so minded, can discover and read them for himself. Some architectural critics I know ridicule the theory here referred to, and say you cannot get your angles with accuracy; but if it be admitted that some at least of the Mediæval buildings have been planned on some geometrical principle, and that the equilateral triangle has been largely used in arranging the plans and proportions of such buildings, it may be replied that if you can make an equilateral triangle with sufficient nearness to truth, so may you do with any other suitable angle. The foregoing are all hints thrown out to bring this subject a little more to the front—not as discarding other helps, nor striving to supersede them, but as something deserving a reasonable amount of attention. In the examples adduced I have given only a slight description, and the references are to outside form in proportioning churches. "Student" will do well, however, to begin with the interior, as that requires the first and may be chief consideration. "Student" will do well, also, to measure actual buildings when opportunities offer, and compare notes. Should "Student" wish it, I will send another time a scale of harmonic angles. The one I have was copied 17 years ago, and has sometimes proved useful.—G. M.

[5824.]—**Damp Inside Walls.**—The materials you require to remove the damp from the surface are now to be had from the Silicate Paint Company, Charlton, Kent. This particular production I have used to a great extent, and cannot too highly recommend it to you. They forward instructions, &c., upon application.—E. J. Tozer, Decorator.

[5824.]—**Damp Inside Wall.**—This is probably condensation of dampness in the atmosphere, and would appear on a smooth Portland cement surface almost as readily as on the inside of window-glass, with which everyone is familiar. There is really no remedy except by drying the air with artificial heat, such as a stove or hot-water pipe, or by good ventilation. If the dampness arises from the foundation, or penetrates through the thickness of the wall, it would soon create mildew, but if from condensation it would appear only in damp weather and disappear with a dry atmosphere.—T. Potter.

[5825.]—**Architect and Client.**—"Anxious Enquirer" has made a mistake and put himself in a false position, for if he were to take his client into court the judge would certainly place the worst construction on the "private letter" about the 2 per cent., and in all probability do what his client has probably done—viz., think there was some collusion between the builders and his architect, and that his, the employer's, interests had been betrayed. Now, if I were in "A. E.'s" position I should let the matter drop where it is, and make the proprietor a present of my plans if he choose to accept them, for nothing, as in my opinion no jury would return a verdict for the plaintiff. If "A. E." were to explain the necessity of quantities to his client and get his consent to the preparation thereof, and to the direct payment therefore he would find his jobs go on much more smoothly and satisfactorily, for clients now a days are very apt to wrongly construe the honest actions of even first-rate men. It is wrong in principle, although right by precedent, for the builders to pay for quantities, and the time will come when the employers will pay for them direct. I myself always adopt this plan, and my clients are always well satisfied with the working of the system. Had all these matters been promptly dealt with by the Institute, boldly condemned and discountenanced, the public would not have been so wise as they are in these matters, and architects' reputations would have been held in higher esteem.—Hereward.

[5828.]—**Modelling.**—"Amateur" is not very clear in stating his desires. If he really wishes to model in plaster he must mix the plaster of Paris with size or common glue water, or beer, to keep it from setting quickly, and whilst in a lumpy state he may model it to suit his taste. But he will not be able to let grass grow under his feet, for it will be found that, do what he will, if he is not very expert the stuff will set before he has done. Of course, if desirous he can carve the plaster, using wood carving tools for so doing. I suspect, however, what is meant is modelling in pipeclay, and then casting the work afterwards in plaster. If this be so, let him buy a shillingsworth of clay at the nearest pipemakers, first getting them to knead it up to the consistency of dough. At the same time he may call at the artist repository and buy half a dozen lance-wood modelling tools of various shapes and sizes. Thus fortified, clay may be shaped either to his own fancy or from any model that may suggest itself. Let him be careful to keep his clay moist until his task is complete. This may be done by keeping a wet rag over it whenever he is not at work thereon. The model complete, it may be cast in plaster of Paris, first making a mould in that material from the actual clay, and then casting a perfect fac-simile from the plaster die. As regards cost, "Amateur" may buy enough clay to model his own bust, tools to manipulate it, and plaster to cast it with afterwards by the expenditure of a few shillings. I know no work on modelling. I would strongly recommend him, however, to take lessons at the nearest school of art before attempting anything of the sort at home.—Harry Hems.

[5830.—**Sketching.**—As many of my *confrères* may be seeking out tours for their holidays, I can recommend this part of Norfolk to their consideration. Within 9 miles are the splendid churches of Blakeney and Cley, the latter of which affords work for a week at least. About 4 miles distant is Walsingham, where there is some nice woodwork, and a most magnificent font, said to be the finest in England. About another 4 miles are the ruins of Wingham Abbey, the west front of which is a beautiful specimen of Early English work, in splendid preservation, and quite worthy of most careful measurement, which, being alone and somewhat pressed for time, I could not fully do. Of these places I speak from personal inspection, but close by are East Barsham Hall (see Pugin's examples), Snoring, and many other places. Leaving here the tourist might make his way, viâ the sea coast, to Norwich, visiting on his way the churches at Trunch, Knapton, Worstead, Tunstead, Martham, &c., for all of which see Messrs. Brandon's various works.—Viator, Wells, Norfolk.

[5831.]—**Wire to Improve Sound.**—This was done with success in the great hall at Plymouth. The new Guildhall there was built at an expense of something like £60,000, and opened in 1873. The large hall is 146ft. long and 58ft. span within the arcades, exclusive of the lean-to aisles. It seats 2,750 people. The style of building is Early French Gothic. The echo was very bad at first, but half a dozen wires were afterwards stretched across beneath the clerestory windows, with excellent effect. Messrs. Norman and Hine, of Plymouth, the architects, under whom the job was carried out, will, I am sure, gladly give "G. G." any further information thereon, if he will put himself in communication with them.—Harry Hems.

[5837.]—**Tile Painting.**—The materials most suitable for securing an enamel surface to tiles, bricks, &c., is the silicate enamel paint, manufactured by the Silicate Paint Company, Charlton. It carries a lasting gloss, which is most brilliant. Instructions, &c., can be had.—A Decorator.

[5838.]—**Weight of Pipes.**—In reply to "A. H." there is evidently something wrong in the rule he quotes. Take a 4in. lead pipe, then we have 4 × ·1005 = ·4020lb. =

$$\begin{array}{r} \cdot 4020 \\ \times\ 16 \\ \hline 24120 \\ 4020 \\ \hline = 6\cdot 4320\text{oz.} \end{array}$$

= say, 6½ ounces per foot lineal. Laxton's "Price Book" gives 12lb., 14lb., and 18lb. respectively per foot lineal. Any one can satisfy themselves by cubing the lead, taking the mean diameter between the inside and outside of pipe according to the thickness they wish it, and multiply by 3·1416, and again by decimal of inches in thickness, discover the inches cube and multiply by the weight per foot cube reduced to inches. The weights I have mentioned would be found to give about $\frac{3}{16}$, $\frac{1}{4}$, and $\frac{5}{16}$in. as the thickness of the metal.—Henry Ambrose.

[5840.]—**Damp from Salt in Cement Flooring.**—I am afraid it will be a long time, probably years, before the salt in the cement will disappear. The ground itself, if near the coast, is no doubt impregnated with salt. I should be inclined to asphalte or tile the floor.—G. H. G.

[5842.]—**Statics and Dynamics.**—I beg to recommend to "Eff Tee" Twisden's "Practical Mechanics." A cheaper elementary treatise is published in Weale's Series. I am not a passed candidate in the R.I.B.A. examination, but I am still able to recommend the above work as one in use largely in some of our best schools and engineering colleges.—G. H. G.

[5843.]—**Surveyors' Charges.**—There is no definite or fixed charge. Some surveyors charge £15 on the first hundred acres, but generally a special arrangement is come to, based upon the size of each allotment or upon the rental.—G. H. G.

[5844.]—**Architect's Responsibility.**—Most certainly not; if an agent gives the name of his client he cannot be held liable for work done or articles supplied. This of course implies that there is no collusion between the parties, and that the agent in the instance named was not aware of his client's insolvency, &c.—B.

[5844.]—**Architect's Responsibility.**—An architect cannot certainly be held responsible for goods supplied to the house of a client in the manner stated. He merely acts as an agent. The question is whether an arrangement to pay was come to.

[5845.]—**Fire-Proof Floor.**—The width the girders are to be apart will depend upon the length of the tiles, as he wants them to break joint on the girders. The length of the tiles will be governed by their thickness. For instance, tiles 24in. square will not do less than 3in. thick. If "Verdoyant" will communicate with me I will give him all the information he requires if in my power.—J. M. Gibson, Buckley, Cheshire.

WATER SUPPLY AND SANITARY MATTERS.

A Russian System of Sewerage.—The *Vratschebniya Vedomasti* gives the following curious account of a method of sewerage which is practised in some towns and villages on the Balkhan. The inhabitants dig a canal, which is supplied with water from some stream, and direct its course towards their town. This canal is generally closed by a dam, or the water is used for irrigation purposes, but from time to time, when it is thought necessary, the dam is opened and the water overflows the streets; the inhabitants then throw into the rushing torrent all the filth and dirt which has accumulated in their courtyards and houses, and even in their cesspools. It is remarkable that in those places where this method of sewerage is practised the people look very strong and well, and malaria, as well as epidemics, are unknown.

Solihull Sewerage Works.—These works, which consist of a sewage farm, situate near Catherine-de-Barnes, Solihull, and between three and four miles of sewers, were officially handed over, on Tuesday, to the Solihull Rural Sanitary Authority by the contractors, Messrs. W. Green and Son, of Warwick. The works, which have been designed by Mr. E. Pritchard, C.E., Warwick and Westminster, and carried out under the supervision of Mr. C. Lewall, C.E., the resident engineer, were commenced in July, 1878, and have cost between £6,000 and £7,000, provision being made for a population of 7,000. The sewers are upon the straight line system, with man-holes and ventilators at each change of inclination, both vertical and lateral. The length of sewers is 3 miles 410 yards, viz., 2,590 lineal yards of outfall 15in. diameter, and 3,100 lineal yards of branch sewers 9in. diameter. The depth of sewers, in consequence of the superficial configuration of the ground, is great, being nearly 20ft. in places. At each end of the sewers is a flushing-chamber, containing between 300 and 400 gallons of water. The sewage-farm is 15 acres in extent, and has been obtained on lease for 20 years at a rent of £4 per acre. The mode of disposing of the sewage is filtration and irrigation combined. The sewage is first received into tanks, which are in duplicate, where deposition takes place, and subsequently it is clarified by upward straining through a bed composed of 9in. of thick gravel. The clarified sewage then passes through underground carriers, and is distributed over the ground by means of brick chambers of a novel character, supplied with disc valves. The land is divided into four plots, and is thoroughly drained to a depth of about 6ft. For times of considerable rainfall provision is made by beds three-quarters of an acre in extent, where, by intermittent filtration, the sewage is disposed of.

LEGAL INTELLIGENCE.

Employer's Liability for Injury to Workmen.—Green *v.* Crampton and another.—This case, tried last week in the Exchequer Division, before Baron Pollock and a Common Jury, ended on Thursday week. It was an action to recover damages for personal injuries received through the bursting of a steam-engine at the brickworks of the defendants, who are large contractors at Otford, near Sevenoaks, as far back as the 20th of September, 1876. The plaintiff is a brickmaker, considerably over 50 years of age, and had been for some years in the employ of the defendants when the accident happened. He was standing some 4ft. from the engine when the explosion occurred, and his right shoulder and side were severely scalded. In consequence of this the muscles, according to the medical evidence, were greatly withered and tightened; and he was much hindered in the use of that arm. In the explosion four persons were killed, among them a son of the plaintiff, and an inquest was duly held on the sufferers. But for the son's death no claim has ever been made on the defendants by the plaintiff. A letter was written to Mr. Crampton, jun., in July, 1877, by the wife of the plaintiff asking for compensation; but Mr. Crampton said the plaintiff disowned this act of his wife's and remained on in the service of the defendants up to the present time. According to the plaintiff's statement, he had earned as much as £3 a week previous to the accident; now he was earning about 30s., though he had got as much as 8s. a day. For some weeks after the accident, the defendants allowed the plaintiff 15s. a week, but the first direct claim that was made on them was by a letter from the plaintiff's solicitor, on April 27, 1878. The great conflict in this case was the cause of the accident, the plaintiff's witnesses suggesting that it arose from the boiler being improperly weakened at the "manhole," as well as from neglect and corrosion; while the defendants' case was that the driver, Johnson, who lost his life in the explosion, had improperly screwed down the spring balances, taken off the stops, and allowed the engine to generate steam freely from a large fire for 20 minutes before the explosion itself. The jury answered the questions submitted by the judge as follows:—1. The cause of the explosion was the spring balances being screwed down, and steam generated for 20 minutes without being utilised. 2. Yes. 3. No. (His Lordship.—Then No. 4 does not arise.) 5. No. 6. The defendants did not know it, and used ordinary precautions. On these findings his Lordship entered a verdict and judgment for the defendants.

CHIPS.

The annual meeting of the Essex Archæological Society was held at Southend on Tuesday. Among the places visited were the early home and reputed birthplace of Anne Boleyn, at Rochford, and the site of King Canute's camp at Canewdon.

The parish church of Blackburn has been rebenched. The work was carried out by Messrs. Veevers and Sons, of Clitheroe, at a cost of £2,000, and the new seats were used for the first time on Sunday week.

The drainage of Fishguard, a watering-place on the South Wales coast, will be completed in about a month's time, the filter beds and the sewering of part of the lower town being the only portions yet remaining to be finished by the contractor.

The corner-stone of the Mitchell's Memorial Hal and Institute at Worsborough Dale, near Barnsley, was laid on Monday. The hall is to cost upwards of £2,000. The building measures 60ft. by 33ft. The architects are Messrs. Wade and Co., Barnsley, and the contractors Messrs. Marsell and Aspen, of Worsborough Bridge.

Our Office Table.

In connection with the annual meeting of the British Medical Association, which this year is to take place in the Queen's College, Cork, from the 5th to the 8th of August, there will be held an exhibition of sanitary and hygienic appliances, the new plant-houses, botanical lecture-room, laboratory, &c., having been set apart for the purpose. An address on Public Health will be delivered by Dr. Andrew Fergus, President of the Faculty of Physicians and Surgeons, Glasgow; and the various meetings and discussions in this department, to which the public will be admitted, will be conducted as far as possible in connection with the sanitary exhibition. The exhibition will be divided into the following departments:—1. Drainage, sanitary appliances, and disposal of refuse. 2. Water supply, filtration, and river purification. 3. Food, clothing, disinfection, and life-saving apparatus. 4. Sanitary building appliances, plans and models, ventilation, heating, lighting, and consumption of smoke. 5. Disposal of the dead. 6. Sanitary literature.

The first conversazione of the Institute of Art Society was held on Thursday, the 24th July, at the Galleries, No. 9, Conduit-Street, W. It was numerously and fashionably attended, and the guests appeared to appreciate the fine collection of works of art executed by ladies. During the evening a selection of music was given under the able direction of Mr. George Gear, assisted by Mrs. Adeline Paget, Miss Payne, Miss Partridge, Madame Ronniger, and the little Italian pianist, Luigi Gustave Fazio (aged 6 years), whose performance was most wonderful.

At the annual examination of the Royal Hibernian Academy of Arts, held in July, of the paintings and studies from the life and antique made by the students in the schools of the Academy during the past session, the following awards were made by the judges, Mr. T. A. Jones, P.R.H.A., Mr. P. Vincent Duffy, R.H.A., keeper, in connection with Mr. F. B. Barwell, representing the Department of Science and Art:—Bronze medal—drawing from life in special competition—Nathaniel Hill. Bronze medal—drawing from the antique—J. M. Kavanagh. Grundy prize of £5 for the best drawing from life made during the sessions—J. M. Kavanagh. Second prize (£3) for drawing from living model—F. W. Osborne. Second prize of £3 for drawing from the antique—J. M. Kavanagh. Second prize of £3 for study in the painting school—F. W. Osborne. Prize of £2 for the best drawing from the anatomical figure—J. B. S. M'Ilwaine.

The London correspondent of the *Freeman's Journal* asks what the lovers of art and encouragers of native genius of the city of Dublin are doing in reference to Foley's beautiful casts. The great sculptor bequeathed them to Ireland. The Royal Dublin Society has no place for them, and they have been handed over to the Science and Art Department, which august body, according to the correspondent, intends to make a selection of the best of them and house them at Kensington, to send others to English provincial museums of art, and to allocate the refuse to Dublin. Yet, he adds, the public men of Dublin are still and apathetic.

A case of poisoning by arsenic recently recorded presents one or two points of warning to artists in water-colours and draughtsmen. A *post mortem* examination of the body of a mechanical draughtsman who died suddenly revealed the presence of arsenic in various parts of his system, though there was not a trace of the poison in the œsophagus and scarcely any indication of it in the stomach. Careful inquiry elicited the fact that the deceased had been in the habit of pointing his pencil when more or less filled with colour by putting it between his lips. Full investigation showed that in the case alluded to it had proved not only a dirty habit but a fatally dangerous one. The sepia this draughtsman had been using contained over three per cent. of arsenious acid; sienna, and a brown colour, the name of which was not known, both presented rather more of the same poison; while a number of others—Vandyck brown, Indian red, bladder green, &c.—had it also, though in smaller quantities. It clearly was from arsenical poisoning that the man died, and it was equally clear that the poison distributed through lungs, heart, kidneys, and brain had been imbibed in infinitesimal quantities during a long period of time.

The third half-yearly meeting of the National Association of Master Builders of Great Britain was held at Hull on Wednesday, the 23rd ult., when representatives from the local associations of London, Manchester, Liverpool, Leeds, Birmingham, Leicester, Nottingham, Wigan, Warrington, Lancaster, Wakefield, Bradford, Hull, Runcorn, Bolton, Lincoln, and Doncaster were present. Letters of apology were read for non-attendance from Preston, Walsall, Wolverhampton, Edinburgh, and other towns. The half-yearly report was read and approved, from which it appeared the building trade in all its branches throughout the country was in a very depressed condition, and in consequence a general reduction in wages had taken place, as well as an increase of the working hours, with a view to reduce the cost of building. The effect of such change, it is hoped, will to some extent stem the tide of depression, and ere long effect a return to prosperity such as the building trade enjoyed some years back. A return was submitted to the members, showing the state of trade, the supply of labour, and the current rate of wages in about ninety towns.

Louis Favre, the undertaker of the Gothard Tunnel, died suddenly, says the *Zurich Freitag Zeitung*, in the tunnel, on July 19th, of heart-disease. He had, during the last seven years, exerted himself to the utmost in overcoming the difficulties of this great undertaking. Although the tunnel is not yet finished, he at least lived long enough to be assured of its accomplishment, nor will his death retard its progress, as his heirs and skilful engineers are well able to continue the important work which he began. Louis Favre was born in 1826, in Chuêne Thounex, near Geneva, and went as a young carpenter to Lyons, where he soon distinguished himself. His want of theoretical knowledge he supplied by employing clever and accomplished engineers, and thus aided by his own energy and intelligence, he was always able to accomplish whatever he undertook. His appearance corresponded to his character. He was a strong man, not tall, but stout, his neck short, his bones and muscles firm, his features hard. The numerous personal, and also pecuniary, cares and anxieties which the Gothard caused him, bleached his thick black hair, and he still feared he might be a sufferer, as, if the work were not accomplished by Aug. 7, 1880, the loss would have to be sustained by him and those who had advanced him so many millions of francs.

The report upon the Severn Bridge Railway works to be presented to the directors and shareholders of that undertaking to-morrow (Saturday), by the engineers, Messrs. G. W. Keeling and G. Wells Owen, states that Hamilton's Windsor Iron Company have nearly completed their contract. The works were much delayed during the winter by inclement weather, and also by the scaffolding being carried away by the high tides in April; but by the aid of the electric light the contractors were enabled to carry on the work by night. This very much accelerated the erection of the scaffolding and ironwork of the last 312ft. span, which is now practically complete. The 132ft. span on the north shore has also been erected, and the swing-bridge engines and machinery completed. The whole structure of the bridge will probably be finished next month. The engineers proceed to detail the land railway works, which we described last week (p. 109), and they add that the whole railway will probably be ready for inspection in September, and may be opened for traffic in October next.

A number of people, whom the *Kensington News* rather vaguely designates as "several scientific gentlemen," inspected the Albert Memorial in Hyde-park. Their attention was drawn to the fact that the marble has been sensibly affected by the atmosphere, and that the "statues forming the fresco," which seems to refer to the bas-reliefs on the podium, have the appearance of having been sculptured from chalk rather than marble. The causes of this were stated to be the acid yielded by soot under the influence of rain and the carbonic acid evolved from the lungs of animals. The members of the inspecting party are said to have been of opinion that unless something is speedily done the monument will rapidly fall into decay. It was suggested that it should undergo a cleansing process similar to that recently performed upon Cleopatra's Needle, and then be indurated with a colourless solution which, according to the newspaper we quote from, will not only preserve it from further decay, but which has the remarkable property of restoring the marble to its original condition. Unfortunately, the names of these very "scientific gentlemen" are not given, so that the value of their testimony cannot be estimated with accuracy, nor can the public be sure that the proprietors of some colourless solution patent were not represented at the investigation.

Some of the ratepayers of Cork City appear to set but a slight value on their own safety when crossing a bridge. When the Town Council of that city were discussing the other day tenders for a temporary structure during the rebuilding of Anglesea Bridge, a deputation of inhabitants waited upon them to propound the truly Hibernian suggestion that the further construction of a new bridge be postponed until the existing bridge has been pronounced dangerous. It was pointed out to the deputation that the bridge has been pronounced "unsound"; and, scarcely convinced of the necessity for spending their money on a new bridge before the old one has actually collapsed, the visitors withdrew to form, it is said, a "Ratepayers' Association."

But if the memorial of their constituents was penny-wise, the Town Council themselves scarcely came off with flying colours with reference to this Anglesea Bridge. A short time since Mr. Fidler, C.E., prepared for the joint committee of Harbour Board and Town Council a design and specification for the temporary bridge. On opening the tenders sent in it was found that the local firms were considerably above those from outsiders, and the joint committee ultimately recommended the acceptance of the lowest, that of Mr. Wm. Gradwell, of Barrow-in-Furness, at £2,932 11s. 8d. The next lowest was more than £400 higher. It was felt in the city that the local firms must have made some mistake, and avowedly in order that they might have an opportunity of obtaining the work, fresh tenders were advertised for. Five tenders were received, and Mr. Gradwell having simply adhered to his original offer, he now took third place. The joint committee, by a majority of one in eleven members, still recommended the adoption of Mr. Gradwell's tender, but the authorities at their several meetings over-rode the recommendation, and in spite of vigorous appeals for fairplay to contractors, decided to accept one of the local tenders, that of Mr. Alex. Rooney, at £2,847 10s.; this was carried at the town council by eleven votes to eight, and at the Harbour Board by sixteen to ten. It is needless to comment on this job. If foreign contractors are to be invited to tender for temporary works, simply, as the sequel shows, that they may oblige the local men with a reliable estimate, beneath which they may safely bid amongst themselves, it ought to be unnecessary and will be practically insulting to their common-sense to ask them to make offers for the permanent structure, which is, by the way, expected to cost from five to six times as much. This is a specimen of Home Rule with a vengeance.

The London School Board have agreed to the requirement of the Education Department that, excluding certain items, the total cost of schools, inclusive of extras and architect's expenses, should be reduced to £10 per child accommodated. It was reported on Wednesday to the board that, in order to give effect to this arrangement, it will be necessary to omit the following provisions from the tenders:—(*a*) All covered playgrounds; (*b*) all wall plastering; (*c*) cement dadoes and skirtings; (*d*) window finishings; (*e*) all handrails to staircases; (*f*) seats in playground; (*g*) gymastic apparatus; (*h*) drinking fountains and filters; (*i*) casings to girders and corbels under girders; (*j*) extract flues for ventilation (in cases where open fires are used); (*k*) all mouldings and ornaments inside and out. In any case where it is considered desirable at any future time to add any one of these provisions, a special vote of the board will have to be taken.

Architects of board schools must keep themselves to the barest necessaries of construction in future. The vestries and the clergy have put so much pressure on the Education Department that an order has gone forth that the total cost of new schools shall be cut down to a certain limit. First, there is to be no covering in the playgrounds, the result of which will be, in our humid climate, that the playgrounds will be made useless half the time. Next there is to be no plaster, but bare brick, which in a schoolroom means dirty, greasy walls. Next the staircases are to be without handrails, which to children involves danger. Next, if the children want to sit down in a playground, they must sit on the asphalte, and in future they must dispense with the luxury of a drinking-fountain. Further, in cases where ventilating apparatus is most needed, it must be omitted from the estimates. And, finally, the trifling cost of the small attempts at ornament which relieve the buildings from absolute ugliness are no longer to be permitted, but the schools are in future to look as much like workhouses as possible. Such, remarks the *Echo*, are Conservative ideas of economy, which will certainly be duly appreciated by the working classes of the metropolis.

Mr. W. St. Chad Boscawen delivered a lecture on recent discoveries in Assyria and Babylonia on Wednesday in the Lecture Theatre of the Royal School of Mines. There was a small collection of Assyrian and Babylonian antiquities on the table, including two fragments of the great bronze gates which Mr. Rassam discovered eighteen months ago in the Temple of Assur-nazir-pal (885—860 B.C.), and which are now in the British Museum; some vitrified bricks from Birs Nimrud, inscribed bricks, tablets, &c., which had been lent for exhibition by Mr. Rassam. The lecture may be described as a popular sketch of the history of Assyrian discovery, beginning with Mr. Layard's first operations with the spade on the site of Nineveh, then touching on some of the results of the late Mr. George Smith's researches, and finally indicating two or three of the additions which Mr. Rassam's two recent expeditions have made to Assyriological knowledge. First the audience received an account of the palace of Sennacherib (705—681 B.C.), discovered by Mr. Layard in the mound of Koyunjik, and that of Esarhaddon (B.C. 681-668), just discovered by Mr. Rassam in the mound of Nebby-Yunus, or the Tomb of Jonah. The next section of Mr. Boscawen's lecture was an account of what he called the University of Nineveh, the syllabaries, the Creation tablets discovered by Mr. George Smith, which Mr. Boscawen thought were not nearly so old as Mr. Smith thought, because on all the copies of tablets preserved in the so-called University there was the inscription "Like its old copy," whereas in these Creation tablets there was no such authentication. Some particulars were given in conclusion of the Royal House of Assur-nazir-pal (885-860 B C.), from which came the famous bronze gates rescued by Mr. Rassam.

The New York Academy of Sciences recently had before them the latest relics of early Central American civilisation in the shape of implements, ornaments, and domestic pottery more recently recovered from graves on the Central American coast. An extensive cemetery appears to have been lighted on beneath several feet of alluvial soil. The graves and tombs, which are said to occupy many square miles, afford themselves evidence of considerable skill in mechanical matters. They are covered by flat slabs of stone, which must have been conveyed long distances, as nothing of the kind is to be met with in the vicinity of the cemetery. There are many indications too of a certain proficiency in artistic decoration, though Professor Putnam, of the Peabody Museum, considers the articles unearthed inferior in this respect to similar relics already discovered in Mexico and Peru. Among other things found are knives and stone weapons, and a number of curious figures of birds constructed apparently as decoy birds, and having a capability of being employed as whistles to imitate the cry of their living prototypes. The urns and vessels of other kinds executed in earthenware present a good many interesting forms; and, one specimen, it is thought, presents a hieroglyphic inscription.

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CHIPS.

An observatory is about to be built at 14, Aberdeen-park, Highbury, for Messrs. Dollond, by Messrs. T. H. P. Dennis and Co., of Chelmsford.

A north aisle is about to be thrown out from St. Mary Magdalen Church in Munster-square, W., from the designs of Mr. R. H. Carpenter.

The contract for the erection of Messrs. Round and Green's new bank in High-street, Colchester, has been taken by Messrs. Saunders and Son, of Dedham, Essex, and the work of demolishing the present premises has been commenced. The architect is Mr. Ernest G. Lee, whose design for the new premises we illustrated a few months since.

New children's dormitories and tramp ward are about to be added to the Carmarthen workhouse, from the designs of Mr. George Morgan, architect to the board.

The City Court of Common Council decided on Thursday in last week to identify itself with the work of restoration at St. Alban's Abbey by undertaking the cost of restoring the beautiful Late Decorated east window of the Lady Chapel, such cost not to exceed £350.

At Lee, Kent, a window has just been filled with stained glass, in commemoration of the 25th anniversary of the opening of the church; it is the work of Messrs. Lavers and Barraud, of Endell-street, Bloomsbury, by whom all the other windows in the church have been designed and erected. At St. Margaret's Church, in the same village, a stained-glass window has just been erected to the memory of the late Dr. Parr.

The brickmaking trade near Faversham is being seriously interfered with by the long-continued wet weather, and it is estimated that the make of bricks this season will be less than half what it was last year, and what had been prepared for now. The price of Faversham bricks must necessarily be much enhanced.

At the Newcastle police-court last week, James Davidson, 30, builder, was brought up on remand charged with forging a bill of exchange, dated 1st May, 1879, for the sum of £19 10s., drawn by himself, and purporting to be accepted by Messrs. Robson Brothers, builders, Elsdon-road, Gosforth. The magistrates remanded the prisoner previous to being formally committed for trial, bail being refused.

The first stone of the new Carmelite Convent, at West Brompton, was laid on the 22nd ult. Excepting the church, which will have a limited accommodation for seculars, the general character will be of great simplicity. The style is Early Pointed. The building will be constructed of red brick, with Bath stone dressings, and grey slates. The architects are Messrs. Goldie and Child, of Kensington-square. The contract has been taken by Messrs. Lucas and Son, and Mr. W. Watson is acting as clerk of works.

Messrs. Loxton and Newman, architects, have been appointed by the local board to superintend the decorative restoration of the Wednesbury Town Hall and its offices.

On Tuesday week about 70 workpeople, with the contractors, sat down to supper at the King's Arms, Fossgate, York, to celebrate the successful roofing-in of the new business premises on Foss Bridge, now being erected for Messrs. Whitehead and Co. The building is built of brick, in the Italian style, with stone dressings. It has been designed by Mr. J. Morley, architect, of Bradford, and the work has been carried out in a most substantial manner under the able superintendence of Mr. J. Maude.

Messrs. Harvey and Davids submitted to auction part of the Alperton Park Estate, Sudbury, on Thursday, the 24th inst., when the plots realised prices ranging from £300 to £1,200 per acre.

The death is announced of Mr. John Berney Ladbrooke, a landscape painter of the Norwich School, whose works are well known in his own county. The deceased was born in 1803, and was a son of Robert Ladbrooke, painter and drawing-master, of Norwich, and a nephew of John Crome ("Old Crome"), whose pupil he became after having received rudimentary instructions from his father, and whose influence was to be traced in many of his pictures.

The picture gallery and museum which are being added to the Wedgwood Institute, at Burslem, are nearly completed, and are to be opened with an exhibition in September.

A new footbridge is being thrown across the Wyre, between Great Eccleston and Rawcliffe, near Garstang, in place of one destroyed by floods last winter. Mr. Garlick, of Blackpool, is the contractor.

The annual dinner in connection with the Blackburn Operative Painters' Association took place on Friday week, when eighty persons sat down at the Grapes Hotel under the chairmanship of Mr. Pickup.

New schools are about to be erected for the Ystradyfodwg School Board at Maerdy and Pendyris, from the designs of the architect to the board, Mr. J. J. Evans, of Maesyffrwd, near Treorky.

On Tuesday, the 29th July, the opening services were held in the new district church of St. Paul, at Dove Holes, near Buxton, in Derbyshire. The building consists of a nave, two small transepts, and a chancel, with semicircular apse, and has a belfry turret for four bells, over the chancel. It is faced with local grit stone, and roofed with red Staffordshire tiles. The external doors and pulpit are of oak. The roofs and all other internal woodwork and fittings are of pitch pine. The church will accommodate 250 persons, and has been erected by Messrs. Drinkwater and Wheeldon, of Bugsworth and Buxton, from the designs of Mr. Robert Griggs, of 11, Gray's Inn-square, at a cost of about £1,600.

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THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 8, 1879.

BOOKS ON MEDIÆVAL COSTUME.

THE architectural student, on seeing the title of this paper, may perhaps ask, Of what possible use can the knowledge of costume be to me? To which it may be answered: If you understand by architecture only a knowledge of the anatomy of houses, or the supervision of their erection, the study of costume can be of no advantage to you unless in your lighter moments you may want to dress for that most ridiculous of institutions, a fancy ball.

If, on the other hand, you view Architecture as the Great Art, entailing a knowledge, more or less, of most of all the other arts, costume may be very useful indeed. It will often enable you to fix dates for buildings or pictures; it will enable you to realise past scenes and past times; it will add a colouring to your reading, and finally will do something towards making you what a good architect should always aim at being—viz., an accomplished gentleman.

Costume, like architecture, cannot be taught by mere reading. Drawings, engravings, and woodcuts, often of an expensive nature, are imperatively required. The books containing these are necessarily costly and beyond the reach of the student. If he ever acquires them it is late in life, when the leisure and desire for study are equally denied to him. In short, when young, he cannot afford to buy, and when old he cannot afford to read them.

It is very true that there are some books of costume within the reach of the student's purse, but then they are naturally wanting in the essential quality of colour. After all, the best plan to learn the subject is: 1st, to read those short treatises which are within his means; and 2nd, to take notes of the illustrations of the more costly books in the public libraries within his reach.

Unfortunately, the British Museum has not yet been opened during the evening; but until that event takes place, as it certainly will, the libraries at South Kensington and the Royal Academy must supply its place.

It is extraordinary, when we consider the subject, how many and various are the branches of study requisite to write a good book on costume.

To begin with, the author must be acquainted with the books already written; he must believe nothing which cannot be proved by a reference to an ancient monument or manuscript; he must be able to read old documents; to have a fair acquaintance with the poetry and romance of the times comprised in his work, besides some legal knowledge; and lastly, he must either draw well himself or have an artist (to say nothing of an engraver) who can do it for him.

Most of the books fail in one or other of these points. Sometimes we find good letterpress and rough, ill-drawn illustrations; sometimes the reverse happens, and we have beautiful illustrations with exceedingly meagre explanations.

Again, the books treating of a history of costume are comparatively few, the best engravings being found in works on some separate subject, such as effigies, brasses, &c.

Beginning with the present century, the first book which treated the subject from a scientific point of view was Dr. Meyrick's "Critical Inquiry into Ancient Arms and Armour." This, for its time, was a wonderful work as regards the letterpress: it let in new light upon the subject, and is the foundation of much of our present knowledge of armour. The illustrations are by no means so good. They are coarsely drawn and engraved, so much so that the artist apologises for them in the next work of Sir Samuel (then Dr.) Meyrick. The said illustrations represent figures in divers attitudes, in the military costume of different epochs.

In the next work of Sir S. Meyrick, viz., "Illustrations of Ancient Arms and Armour, from the Collection at Goodrich Court, (1830)," the artist, J. Skelton, went into the opposite extreme. The illustrations are drawn with a very fine line, occasionally backlined. The drawing is very good indeed; but there must be always something incongruous in representing heavy things like arms and armour by gossamer outlines. Altogether this work is most valuable, more especially as the collection is now dispersed to the four corners of the globe. The letterpress, by Sir Samuel, simply contains short and business-like descriptions of the objects engraved. This work now sells for about £5.

We now come to the labours of our friend, Mr. Planché, who, I am happy to say, still remains with us, and who has made in his 84th year the last contribution to the history of costume, which will be noticed more at length at the end of this paper. In 1834 appeared the "History of British Costume," being one in the series of works constituting the Library of Entertaining Knowledge. Mr. Planché then and there did for civil costume what Sir S. Meyrick had done for the military, and the book still remains one of the cheapest and best epitomes of the subject. It can be picked up at book-stalls for some four or five shillings, and any student beginning the subject will do well to secure it. Considering the period at which the book was produced, the woodcuts, although unequal in merit, are by no means bad. In 1837, Mr. Planché wrote the chapters on Costume in "Knight's Pictorial History of England." Here the matter is enlarged, and the woodcuts are somewhat better.

In 1840, Hefner began his great work, continuing the publication to 1854. The book consists of all sorts of things, but the majority of the plates are devoted to military and civil costume. This is a very beautiful and a very expensive book, an uncoloured copy being worth some £8, and a coloured one from £30 to £40, according to the binding. The plates appear to be fairly correct, those in the last of the three volumes being the best; but one is apt to be suspicious of the thin lines of the illustrations from Early MS. contained in the first volume, more especially as we know that the figures in early illuminations for the most part were surrounded with thick outlines.

The date 1843 appears on Shaw's "Dresses and Decorations." This is also a very beautiful book, more especially if an early and well-finished copy be obtained; and, like the work of Hefner, contains other things beside costume, the plates being engraved in aquatint, and coloured by hand. There can be no doubt of the careful execution; but the accuracy cannot always be vouched for, as several subjects have been copied from other books—*e.g.*, the Sixtus IV. from Bonnard and the Troytown from Du Sommerard. There is no paging, and reference to any particular plate is therefore difficult. Mr. Quaritch, having bought the plates and copyright, has now brought out a new and cheaper edition. A fair copy used to cost £5.

While on the subject of beautiful books, there are three works which should be mentioned together as examples as to how costume illustrations have been and should be executed, viz., Stothard's "Monumental Effigies," Bonnard's "Costume," and Waller's "Monumental Brasses." Strange to say, although not exactly books within the reach of the student, they are not very expensive; but they are well worth their price, because we have the handwork of the artists themselves.

Stothard's book bears the date of 1817, and may be said to open the series of modern works on costume. Unfortunately, he died in consequence of a fall from a ladder before the completion of the work, and thus several plates are etched by other hands. It is almost impossible to describe the exquisite feeling and accuracy with which everything is drawn, and it is still the best book as regards illustrations of costume. The letterpress is by a Mr. Kempe, and though very carefully written, as regards the biography, does not give the local information that would doubtless have been furnished had Stothard written it himself. The price of Stothard is from seven to ten guineas. Hollis's "Effigies" (1843) may be described as a continuation of Stothard, and are nearly, if not quite, as well done.

Bonnard, whose name is attached to one of the most beautiful (if not the most beautiful) work on costume, appears to have had little to do with it except writing the descriptions, which, by the way, are not always quite up to our present knowledge. The real artist was P. Mercurj, who both drew and engraved the plates. There are several editions, one in French, as early as 1829, but there appears to have been an original Italian issue in the first instance. Mercurj was a most excellent artist: he drew most gracefully; so much so, that putting aside the additional information afforded by the colouring—it is very doubtful whether the uncoloured copies are not to be preferred. The system adopted was this: if the subject were taken from an original which was well drawn, say from one of the early Italian masters, a direct copy was made; but should the original, on the other hand, be an effigy, or an early illumination, or statue, it was put into good drawing and often in another attitude, but it must also be added, always in a very graceful one.

In the letterpress there is a particular description of the colours, which is fully carried out in the coloured copies of the plates, even in instances where no colour exists in the original. Thus the monument of the Knight in Santa Maria Annunciata at Florence, the statue of Rowland in the porch of Verona Cathedral, and the effigy of Judge Gascoine copied from Gough's "Sepulchral Monuments," are all highly coloured. The price of this beautiful book, which is in three volumes, depends a good deal on the colouring; a coloured copy would be worth, say, 12 guineas, and an uncoloured one five or six.

Equally excellent are the "Monumental Brasses" of Messrs. Waller, which bear the date 1864. This, however, only indicates the issue of the last numbers, a considerable amount of years having intervened between the beginning and completion. Messrs. Waller are artists, like Stothard and Mercurj, hence the beauty of the work. It may be objected: How can there be room for artistic feeling in what is only a reduction from a larger original? It only requires a comparison of Messrs. Waller's production with any other work on brasses, for this question to be answered. It is exceedingly to be regretted that these gentlemen did not carry out their intention of completing these works by the publication of the remaining important brasses, such as those at Lynn and Newark. As the author very truly says in the preface: "There have been no representations worthy of them, nor of any value as authorities." Is it too late to hope that Messrs. Waller may supply the omission? Messrs. Waller's book is now scarce, and may occasionally be met with; but it is on the cards that particular copies are not complete owing to the time occupied in publication.

The Lynn brasses will be found in Cotman's work on the subject, and also in Carter's "Ancient Painting and Sculpture."

These are tolerably expensive works, but those of Boutell and Haines on monumental brasses are within the student's reach.

The same may be said for Hewitt's "Ancient Armour," three vols. This is an exceedingly painstaking work, and is illustrated with very fair woodcuts; but, in spite of all this, it is not an agreeable book to read, the author making so many references to illustrations in other works, that one feels one ought to peruse it in a library, not in a room. The work has not inaptly been described as rather materials for a history of armour, than a history itself. The date, 1855, appears on the first volume; it costs £2. Mr. Black's translation of Demmin's "Weapons of War" bears the date of 1870. It is a catalogue (illustrated) of the principal armour and weapons to be found in the Museums of Europe, or in private possessions. Of course, in such an ambitious work mistakes must easily occur, still the idea is a good one, and we must hope that some day there will be a revised edition, with new and more careful illustrations; at present these latter are not very satisfactory.

In a catalogue of books of costume the "Monuments Inedits" of Willemin should not be forgotten, more especially as for many years his book was the storehouse for the engravings of other writers. He is described on the title-page as *draughtsman*, *engraver*, and *antiquary*. The figure subjects are very well drawn, but the same praise cannot be given to the architecture. The contents of the books are exceedingly curious and interesting, while the letterpress was excellently done by the late M. Potier, the well-known curator of the museum and library at Rouen. The dates, 1808-1830, appear on the title-pages. The price, which depends on the care bestowed on the colouring, varies from 16 guineas.

In 1874, Messrs. Lonsdale and Tarver published a series of 50 outline lithographs, representing the Costume of the Middle Ages, with a very excellent introduction by the former gentleman, to whom also are due the sketches from the early Italian masters which occur occasionally. Only a limited number of copies of this work were issued, so that it hardly can be said to be in the market; price 25s. Of late years French publishers have issued some very expensive works, such as "Les Arts Somptuaires," "Le Moyen Age, et La Renaissance." They contain, as might be expected, many old friends and many new ones in the way of illustrations. The letterpress is often very unequal, and they may be regarded more in the light of drawing-room books than for the use of students.

Another coloured book, issued by Pauquet Fréres, hardly deserves notice; it commences with a mistake in chronology, inasmuch as our old friend the 12th cent. statue, from Corbeil, does duty as St. Clotilde ("493 apres les monuments de l'Epoque"). The work ends with a mistake also, as it presents us with an illustration of the hideous fashions of the 2nd Empire, crinoline and all.

We must now consider two serious works, viz., those of Fairholt and Quicherat: they are both excellent works, useful to the student and by no means high-priced.

Mr. Fairholt published his second and enlarged edition in 1860; it consists (1) of a history, and (2) of a dictionary of costume. The woodcuts were drawn by himself, and were all taken from old examples. Unfortunately, they are all spoilt, as to accuracy, by a system of backlining, the backline being often out of all proportion to the size of the figures; the latter also want that grace we have observed in Stothard and Bonnard.

M. Quicherat's work, which bears the date of 1875, partly came out many years ago in the *Magasin Pittoresque;* but, in his preface he tells us that he has entirely revised this portion of the text and the cuts. The latter are by no means remarkable; but some parts of the text, especially that portion on the early Gaulish costume, are very instructive.

We now arrive at the great work of M. Viollet-le-Duc, the "Mobilier Français."

In 1858 this gentleman published the first volume, which comprises the furniture. Ten years then elapsed before the second volume was commenced. This contains the utensils (sacred and civil), goldsmith's work, instruments of music, games (including tourneys and joustes) and tools, being successively followed by four other volumes, two of which are devoted to dresses, jewellery, and objects belonging to the toilet, and two (final) to arms and armour; so that in reality there are no less than eight dictionaries instead of one. These dictionaries are excellently arranged; all have the word printed on the top of the page, so as to make reference easy; very great care is taken with the A. B.'s. and C. D.'s, and at the end of each volume is a table of the words contained in it, with paginal references.

The great fault of the work is one which is shared by the Architectural Dictionary of the same accomplished author—viz., there are no explanations under the woodcuts; so that in order to find out what the said woodcuts illustrate, it is often necessary to search one or two pages backwards and forwards, for the reference is not always in the vicinity of the woodcut.

It is true this system compels the student to read the work; but it by no means leaves him in the best humour with the author, while the separation of the woodcut and reference becomes very troublesome even to the reader who is going straight through the book, more especially when the subject demands great attention and there are references to A. B.'s and C. D.'s. It is needless to say that the woodcuts are most excellent, as is the case in all the works of this author, who draws them himself upon the wood. In practical architecture the power of drawing is often found to be, like beauty itself, a most fatal gift; for alas! the new stone walls and new roofing will not reproduce all those delicate etchings, and bright effective shadows and lights in the original sketch: but in such cases as the one before us the drawing cannot be too good. It is indeed very good in the present instance, and apart from the letterpress, the woodcuts alone would make these books desirable as objects of art. The only exception is with regard to the figures, showing the costumes, not as they appear in the MS., but as put into drawing by the author. These, indeed, are very far from having that exquisite feeling and grace which comes from the heart, and which we have noticed in the works of Mercurj and Stothard, but this is almost the only criticism to be made on the art of the book, and, after all, it may be questioned whether any other living architect could do as well.

It is the four last volumes which specially demand our attention, viz., those relating to costume and armour. The system has been this: occasionally the figure is given as it exists in the original MS., but in the majority of cases the author redraws it in his own way—and as the readers (at least our English ones) have not the MS. to refer to, all the criticism falls to the ground. In the armour the same course is followed, only as so very many of the original pieces remain, occasion is afforded to the author to make some exquisite transcripts of ancient work.

With regard to the garments and their names, the reader is apt to become rather puzzled when he finds the most diverse garments illustrated under one head, as in the case of "corset," or, on the other hand, two nearly identical dresses under two heads. The fact is, that the same name was in course of time often applied to a different garment, as Mr. Planché has very clearly pointed out in the case of hauberk, which originally meant a coat of mail, but used by Chaucer as meaning a breast-plate.

Mr. Planché, in his dictionary, thus remarks on M. Viollet-le-Duc's article on the word "corset."

After saying that the term corset seems to him to be generally applied to various garments worn by men as well as by women, which had, nevertheless, special names of their own, but all possessing the peculiar feature—that of closely fitting the person from the neck to the waist, such portion being still called the "body" of the dress in English, and "le corsage" in French, he continues—"This interpretation can alone justify M. Viollet-le-Duc in illustrating his article with representations of the kirtle, the cote hardie, the jacket, the doublet, the pierpoint, and other vestments of the 14th and 15th century, to which the term corset has not been applied by the writers of those times, who speak of them by the names they were properly known by."

Thus far Mr. Planché, and as a moral I would suggest that there can hardly be a more instructive course for the student of costume, than to read up the same articles of the two authors, and then to try and find out, by original authorities, which of them is right.

Before finishing with M. Viollet-le-Duc's work, it should be noticed that he often gives diagrams showing how the different garments were cut out. This, of course, must be to a certain extent a matter of conjecture, but they look, at least, very probable.

The price of the "Mobilier Français," is about eight guineas. It is a work of which every student should be possessed.

We now pass to the last work on our list, viz., the "Encyclopædia of Costume," by Mr. Planché, which, begun in 1876, is now finished. It consists of two thick quarto volumes, the 1st containing a dictionary, the 2nd, "A History of Costume, including Notices of Contemporaneous Fashion on the Continent, and a General History of the Costumes of the Principal Countries in Europe."

We left Mr. Planché in noticing his first work on "Costume," published in 1834, more than forty years ago. We now meet him again as the author of the "Encyclopædia of Costume," giving us the advantage of his various acquisitions upon the subject made in that period. During the forty years he has led no idle life; he has been not only one of our best antiquaries, but one of the best play-writers of our time, for Mr. Planché is still with us, and as he says in his preface, has brought out this last book at the age of 84. One thing has been apparent in all his antiquarian writings, and that is his sterling common-sense. He has written the most sensible, perhaps the only sensible, book on what many consider as the vain science of heraldry, and when the late Professor Cockerell had made a sort of iconographical romance out of the statues in the west front of Wells Cathedral, Mr. Planché had the courage to submit the said romance to the crucible of fact, and to disperse the professor's theory into thin air. From these antecedents, students would be justified in expecting in these volumes, a straightforward common-sense view of the various disputed questions as regards costume, and they will not be disappointed. Mr. Planché equally rejects the theory of Viollet-le-Duc, of the Norman warrior getting into his panoply by a slit in the breast, and Mr. Wallers' explanation of banded mail, although the latter theory has more to be said for it than the other. There is much curious information at the end of the second volume about foreign and theatrical costume; also on the vexed question of the ancient Scotch and Irish dress. Altogether, we ought to be very glad to have so excellent a book, containing the experience of a lifetime and we thank Mr. Planché accordingly.

Unfortunately, the work is far inferior to that of M. Viollet-le-Duc in two very important matters—the illustrations are very much below the literary part, and there has been but little care in the preparation for the press. On the latter point, it may be observed that there are no words at the top of the pages of the dictionary, which makes the looking out of any subject a most troublesome occupation, inasmuch as some pages occupied with long treatises do not contain the word in capitals. It is true there is an index of words, but that is found at the end of the second volume.

A similar thing occurs in Wood's "Natural History," where often the numbers of the pages are wanting for several consecutive leaves—those pages with wood-cuts at the top having no numbers.

Again, in one of the coloured plates, the tinctures of the arms of England and France are transposed,—the former being azure 3 lions passant regardant or, and the latter gules 3 fleur de lys or. This rather surprises us in a book to which the Somerset Herald's name is appended.

As to the woodcuts, perhaps the less said the better; some are taken from the book of 1834, others from the pictorial "History of England," 1837, and other sources. Some of the new ones are fairly drawn, which can hardly be said for others. Mr. Planché, in giving us his excellent letterpress, ought certainly to have bargained with his publishers to afford the best artistic assistance procurable. This would not have been difficult to get, as, unlike M. Viollet-le-Duc, he does not indulge in new figures, but keeps strictly to his authorities. Had it been desirable to have put the old figures into correct drawing, there is one artist among us who could have done the work better than anyone else, and that is Mr. Tenniel. A book on costumes by Mr. Planché, illustrated by the former gentleman, would be a work of which we should all feel proud, and one we might fairly pit against even that of M. Viollet-le-Duc.

At the same time, we ought to be very thankful to Mr. Planché, and it is to be hoped that he will live to edit a second edition with a new and better series of illustrations. The publishing price of the "Encyclopædia of Costume" is seven guineas.

Note.—The above books represent only a selection out of the very numerous works written on the subject. For others see the word "Costume" in the catalogue of books at South Kensington.

W. Burges.

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THE NATIONAL COMPETITION PRIZE DESIGNS.

The National Competition Prize Designs at South Kensington are now on view, and compare favourably with former work of our art schools. In the antique, the studies from the round, and in the oil and water-colour drawings, the present exhibition must be pronounced creditable, and fairly represents the artistic capabilities of the country. We shall now confine our attention solely to the architectural designs and drawings, and the decorative work; but before speaking of the drawings we must complain of the very bad arrangement of the subjects, which appear to be hung without any reference whatever to classification. We alight for instance in two or three parts of the galleries upon architectural designs, and upon drawings of decorative subjects, while in some instances the perspective of a design is found on one screen, and upon another we come to the elevations and plans. This want of method is the less excusable in a large gallery where there was ample room for an orderly classification.

We begin with the designs in architecture. Mr. A. Marshall, a former competitor who has taken honours in this branch, again wins a medal—this time the silver medal—for a design for a cathedral church. The plan is cruciform, and has a central tower and spire, with two western towers crowned by wooden roofs, the design putting us in mind of Lincoln or Canterbury cathedral, but with the addition of the spires. The perspective is creditably drawn in ink, but the perspective of aisle is faulty. The elevations are, however, more carefully and effectively drawn, and the detail of Early Perpendicular character is generally good. The choir is pierced with fine lancets, and the nave with wide Perpendicular windows; whether this is intentional or the effect of mere copyism it would be difficult to say. The same author's design for a memorial lych gate indicates considerable taste and knowledge of the style, but the construction as shown by the section is not good. Next to this design we meet with another drawing for a church, to which a bronze medal is awarded. The author is Mr. F. Ball, of Nottingham. The details and drawing are very indifferent, the proportions are not pleasing, and the *flèche* at the crossing is too large. Mr. G. S. Doughty, of Nottingham, receives a national book prize for a church with a dignified tower, and spire lacking in proportion; the ink-drawings and elevations show superior work to the design we have just noticed, and which gains a higher medal. We notice a familiar face in a design for a mantelpiece contributed to our Designing Club. A bronze medal is awarded also to A. Hemingway, of Barrow-in-Furness, for designs for church windows. The Geometrical circular windows are clever. Mr. J. L. Edwards, Sheffield, wins a bronze medal for a design for a staircase of an elaborate Renaissance character. There is a want of repose in the composition which the sepia drawings rather intensify by the absence of breadth and shading, and the open arched panels are deficient in depth and shadow. A bronze medal is also awarded to Omar Mahomed, Brighton, for a design for the side of a room. There is nothing remarkable in the design, which is Italian in style and rich in colouring. Certainly a great miscarriage of justice is evident in awarding a silver medal to F. Marriott for a panelled ceiling of very weak conception and poor ornament; while a book prize only is given to H. E. Clifford, of Glasgow, for a very refined elevation in brown ink for the decoration of a dining-room in a delicate species of Renaissance or English Classic. We cannot conceive how a design with such a marked defect as panels with compositions that can only be seen one way, could have been selected for a ceiling. A national bronze medal is given to E. Cruickshank, of Derby, for a set of designs for a cottage hospital, a village inn, village club-house, a group of three cottages, &c., most of which we recognise as contributions to our Designing Club, under the motto "Tam o' Shanter," meritorious in design, and careful in drawing. Exeter is represented in this class by G. Parsons, who sends careful measured drawings of the tomb of Bishop Stafford, in the Lady Chapel, evincing much patience and correct delineation in the details, though not a very pure example of Late Gothic. A book prize is awarded to it. A book prize is also won by H. Thorpe for a design for a country-house. We cannot speak highly of the work. In the first place the style is Italianesque of a very indifferent type, and the architecture is of a very questionable kind; we find a pier right over the centre of entrance doorway—a decided defect, and the details are generally poor. The plan is straggling, broken up wastefully, with a hall of immense size. G. Oatley, of Ryde, gets a book prize for some neatly-executed drawings of doorways, one from Wootton Church, Isle of Wight (Norman); and other specimens in the same style from Yaverland Church; details from Quarr Abbey, &c. Of designs for decorative purposes, we note that the gold medal is won for an exceedingly well drawn design for mosaic pavement by J. M. Bradburn, Coalbrookdale. The design is Roman, and the colours refined. In the centre panel the signs of the Zodiac are represented, and other panels round the border contain representative emblematic figures of animals. A fret surrounds the whole. For a similar work J. Thomas, Halifax, receives a silver medal; the pavement is Pompeian in style, and the design chaste and delicate in colouring. The same medal is given to J. F. Marshall, Nottingham, for a design for a boudoir ceiling, Classical in spirit, and delicate in colour. P. M. Carew-Smyth, Belfast; and J. Briggs, Edinburgh, and E. Jarratt receive prizes for some cleverly conceived tile designs. Another good design by Smith goes unrewarded.

At the other end of the room we notice several coloured designs of an architectural character, executed by students of the National Art Training School. A bronze medal is taken by A. Lewis for a design for a country house, in red brick, half-timbered, and parget in the upper part, conceived in an Old English style, clever in drawing and detail, and with a plan that is certainly above the average work of these exhibitions. A bronze medal is awarded also to E. Greenwood for a club-house in palatial Italian, neatly drawn, but having many defects of composition. Among these we remark weak pilasters of Corinthian order, both in the basement and principal story, detail and plan that betray the tyro, and ignorance of the principles of Classical design. It is to be regretted so much labour has been misspent in attempting so ostentatious a subject. Among the other drawings we notice a silver medal coloured drawing of the screen at back of choir of St. Paul's Cathedral, neatly and carefully executed; also one by G. F. Perkin, which receives a bronze medal; and one or two others evincing much pains in drawing. We again repeat that architectural design is not to be taught in our art schools in the manner that the Government teachers persist in following. Unlike the system they pursue in the other branches, the student of architectural design is allowed to select the most elaborate specimens of architecture he can—cathedral churches, club-houses, and palatial villas. All the designs of this pretentious kind display faults more or less obvious to everyone familiar with architectural detail. It is like putting an intricate rhyme before the pupil who has not mastered simple prose composition.

The designs for ironwork, as usual, exhibit elaboration and intricate detail rather than original adaptation of the principles that should govern metal work. The gold medal this year is awarded to G. W. Shepherd, Coalbrookdale, for a design for wrought iron entrance and side gates, good in outline, the panels having scrolls and foliage, and the whole displaying knowledge of hammered and riveted work. A silver medal has been presented to P. O'Keefe, Westminster, for a design for wrought iron gates, evincing a right conception of metal work. Other drawings from Belfast, &c., exhibit a redundance of intricate ornament, but no conception of true design. A national book prize is given to an elaborate design for gates, by J. Speller, West London, cleverly drawn, but wanting in plain bars and repose—the panels are all foliated. The same prize has been taken by W. Gething, Stourbridge, for a design for gates, Gothic in style, also meritorious. W. H. Banks sends an over-floriated design, for which a book prize is given; another fair design, by Pridmore, goes without reward. For measured sketches of ironwork W. Schollar, Westminster, receives a silver medal. They comprise some charming sketches of wrought work from Chelsea, Twickenham, Clapham, St. Paul's Cathedral, Hammersmith, Whitehall, &c. The Plasterers' Company prize drawings this year show some creditable work, but the prizes do not appear to have fallen to the best designs. The bronze medal is awarded to F. Gibbons, Cirencester, for a design for a frieze (not cup, as stated),—certainly a finely-executed drawing, but without any special merit, originality, or vigour; but Mr. A. Garbutt, of the Royal Architectural Museum, who unquestionably sends a more spirited sketch in monochrome, only gets a book prize. The frieze shows three panels with classical figures, but the drawing is rough, and exhibits inaccuracies of an anatomical character. We notice a book prize only is awarded to H. Winterbottom, Sheffield, for a frieze in which are panels with subjects representing the "Months," from "Spenser's Seasons," cleverly drawn and Renaissance in design, and certainly the best work. Another design in brown ink, in which the honeysuckle has been introduced, is also meritorious, but unrewarded. Other designs for the same subject, signed Briggs and Proctor, are carefully drawn.

In textile fabrics (for the Owen Jones prizes) we find the national gold medal is won by Mary Denley, of Westminster, for a design for a carpet. The centre has a rich brown diaper, and is surrounded by a conventionalised green and brown border of rich Oriental design. The bronze medal goes to Annie Brander, South Kensington, for a design for Crétonne, with a rich folial pattern. J. Hussey, of Kidderminster, also receives a bronze medal for Brussels carpet, and A. Wimbury, for another rich design with green leaves on a black ground relieved by white flowers. The gold medal falls to Joseph Castle, Manchester, for a chintz design, in which the strawberry (flower, fruit, and leaves) have been very cleverly treated in a naturalistic spirit; the colours also are soft and delicate—sage green and a light pink on a faint ground. Some pretty designs for muslin draw attention. W. Dunn, of Westminster, has a fine pattern quite in keeping with the material, which takes the silver medal; another medal is given to W. T. Thomas, for sprigs of flowers in a light green; and a bronze medal to Annie Johnston, Dublin, for some neat designs in the same material.

Lace as usual forms an important class of exhibits, and Nottingham, of course, distances all other places. This year the gold medal is awarded to A. J. Sewell, of Nottingham, for a richly covered lace curtain pattern. The floral border is hardly bold enough. R. S. Bonnallo, Nottingham, receives a silver medal for a clever design for lace curtains, but the border is not the most pleasing part. Bronze medals are awarded to F. Baker, A. W. Bretnell, T. W. Hammond, all of Nottingham, for similar designs, the handsomest border being that of F. Baker. H. Seagrave, Notts, takes a book prize for a rich lace; so also does A. Peacock, for a very excellent pattern, bolder in conception and with a more striking border than the two first. We notice also an excellent geometrical design for table-cloth border, by Marian Reeves, Birkenhead, which receives a prize, and a lace curtain by A. Barnes, which has not been rewarded.

Ornamental design is very conspicuously represented. We observe some very tastefully-conceived designs for tiles, table-covers, and box-lids. Wall decoration, as usual, receives much attention. For the Owen Jones prizes there are several excellent contributions. H. D. Fussell has a honeysuckle pattern for a dado, rather large. The silver medal is given to H. H. Hitchings, of Nottingham, for wall decoration—a dark ground relieved by rich pink flowers and sage-green leaves; the same prize falls to W. H. Wightman, of Nottingham, for a more conventionalised treatment of flowers and foliage, the colours being dark and rich, outlined in gold; also to H. Oakley, for oak foliage on black ground, the colours monochrome, gold outline. R. Bonnallo, Nottingham, sends a chaste treatment of foliage chocolate in tone, outlined in gold. Medals are also awarded to J. Butler, Notts, and to Keith, Salisbury, for other designs; the latter a more naturalesque treatment of flowers and foliage in three shades of leaves and black ground. We have no space to mention the excellent studies of bronzes and enamels, for which J. Clarke, of South Kensington, obtains a gold medal; the enamels of different kinds awarded a silver medal, and the copies of painted porcelain; but may just allude to the chief prize drawings in oils and water-colours. In the former the gold medal is won by C. M. Wood, of Bloomsbury, for a group of vase and flowers, with mirror reflection, clever in grouping and outline and delicate in colour; a silver medal is awarded to W. Mills, Birmingham, for a group of earthenware and bronze, richly harmonised; and a bronze medal falls to C. Pratt, of the same town, for a group of ware and books. Alfred Hart, of Brighton, receives a silver medal for a pleasing grouping, harmonious in colour. In the water-colour the silver medal goes to Mary H. Surenne, for a composition, a group of earthenware, certainly clever in drawing, soft in manipulation, and truthful in shading.

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SEWAGE DIFFICULTIES AT ROCHDALE, AND THE LEGALITY OF STORM-WATER OVERFLOWS.

ROCHDALE is one of the towns which has long been before the public as a model of the successful employment of what is termed the pail-system for the disposal of its excreta. Under the zealous administration of Mr. Alderman Taylor, the dry system, as practised at Rochdale, has attracted the attention of the country at large, and as a vast improvement upon the old-fashioned midden system, the arrangements there carried out for substituting for the former middens impervious receptacles, frequently emptied, and thoroughly cleansed, have much to recommend them. We do not at the present time propose to consider the details of the dry system in use at Rochdale, but to direct the attention of our readers to certain recent difficulties which appear to have been encountered there with the water-carried sewage.

Advocates of the various dry systems have frequently been reminded that an interception system fails entirely to provide for a large volume of foul and polluted liquids, which must inevitably be accumulated "wherever human population resides," and must (however perfect the system of excrement removal in vessels may be) be provided for independently, and be carried to an outfall. It is an often-quoted result of certain careful observations, conducted by the Rivers Pollution Commissioners, that the sewage water in a midden town differs but very slightly from that of a water-closet town. In the Local Government Board Report of 1876, page 19, Messrs. Rawlinson and Head summarise these results somewhat incorrectly as follows: "12 tons of average sewage from a midden and privy town will in round numbers equal 10 tons of sewage from a water-closeted town in manurial value, so that the mischief, cost, and intolerable nuisance of a retention of the privy system—and this also is applicable to all so-called dry systems—only reduces the strength of the sewage by two-sixths." (Query, should not this read one-sixth?).

The authorities at Rochdale appear hitherto to have been very little troubled with their sewage water. They have suffered, we believe, somewhat from nuisances caused by the drainage matters from the "tips," but the surface water and domestic sewage has until quite recently been passed unchallenged into the Roach (already a much polluted stream), and has thus been simply and conveniently disposed of. But this state of things has been rudely put an end to by an action brought by a local mill-owner against the corporation for the pollution of the river. This action is, we believe, still pending, but it will doubtless result in the issue of an injunction forbidding, under heavy penalties, the discharge of raw sewage into the Roach after a given date. To provide a remedy the corporation have caused their surveyor, Mr. Hewson, to prepare a scheme which proposes to obviate the nuisance by the construction of outfall sewers and the acquisition of land for dealing with the sewage at the outlet. The following is a short estimate of the cost of the work:—

	£	s.	d.
27a. 2r. 30p., statute acreage of land called Half-acre Farm, at £250 per acre	6,926	11	3
Preparation of land, main carriers and chambers	5,822	0	0
Tanks and sewage channels ..	15,811	0	0
Outfall conduit and river crossing	4,379	0	0
Intercepting sewers	34,593	0	0
Internal main sewers necessary as outlets for private street sewers..	35,627	0	0
Easements, surface drains, professional charges, and costs and supervision of works	8,841	8	9
Total	112,000	0	0

This is a somewhat heavy bill for a borough to face, especially for one which has so long been regarded as a pattern of a successful and well conducted midden town, and the opponents of dry systems will doubtless point a very instructive moral from the experience of Rochdale. It may not be amiss, before we further examine Mr. Hewson's proposals and the discussion on the subject which took place when they were considered by the town council, to glance at the costs of the midden system as now conducted. These are analysed in the Local Government Board report before alluded to on pages lvi. and lvii. Rochdale in 1876 had a population of about 67,000 persons (now 71,200), rateable value £222,000, houses 14,388, waterclosets 350, and privies on the old and new systems 8,306. It would appear from this that upwards of 6,000 houses are devoid both of privies and closets; but it must be remembered that it is usual in the manufacturing districts to provide only one privy to each two houses. The annual cost of the cleansing of the midden and pail closets, deducting the amount received for the manure, is set down as £7,024. The cost of works and plant is taken at £10,000, and the amount expended on drainage to that date is stated to be £20,000. If we capitalise the £7,024 roughly at £150,000, we arrive at a sum but little greater than the amount about to be expended in the water-carried sewage, and it must be remembered that the estimated outlay of £112,000 makes no provision for any special mode of treatment at the outfall, nor for the annual cost of working and maintenance. It would appear from the report of the council meeting upon the occasion when the scheme was brought forward that the plans and estimates prepared by the borough surveyor had been referred to Mr. Vawser, and that this gentleman had introduced sundry modifications into the scheme submitted by Mr. Hewson. With respect to the discussion which took place, for which we are indebted to the account of the meeting given in the *Rochdale Observer*, Mr. Alderman Littlewood stated that with respect to the purification of the sewage at the works, "they could only arrange in the main and in the rough as to what might be the best plan. Before the works came to be actually in operation the science of chemistry might have made such an advance in this direction that they would be able to adopt some better plan than any they could see at this moment. Therefore, it would be of very little good for the council to spend much time in discussing this part of the question now." This is either a very hopeful view to take of the progress of chemistry, or a very despondent one of the time the outfall works are to remain in hand, and as the Rochdale scheme has to be submitted to the Local Government Board, we doubt if the same waiting policy will be endorsed by the inspector.

But this lack of any definite mode of treatment, for which the present conflicting state of our evidence with regard to sewage treatment is perhaps to blame, was not by any means the chief difficulty which seems to have forced itself upon the Rochdale Town Council. It appears that Mr. Vawser, in his report on Mr. Hewson's plans, took exception to the treatment of the surface-water advocated by him, and in lieu of so arranging his sewers as to receive all the surface-water along with the sewage (making provision for heavy rainfall by the introduction of storm overflows, which seems to have been the course proposed by Mr. Hewson). Mr. Vawser advocated the exclusion, as far as possible, of all surface-water from the outfall sewers. This he hoped to be able to accomplish at a relatively small cost by availing himself to a great extent of the existing drainage, which at present discharges itself at numerous points into the river Roach and its tributaries. By disconnecting the present sewers from the new system, and excluding from them the house drainage, Mr. Vawser anticipated that with an outlay of £5,000 only he could duplicate the outfalls, keeping the surface water distinct from the liquid sewage. There can, we think, scarcely be two opinions respecting the advisability of the latter course, particularly when it is remembered that by excluding in this way the surface water Mr. Vawser anticipates a saving of £10,000 upon the main outfalls, which he will be able to reduce in capacity.

The Rochdale authorities appear, however, to have been in considerable doubt whether the plan of discharging untreated surface water into the river would satisfy the terms of the anticipated injunction, and an animated debate ensued upon the question whether water unmixed with actual house sewage would be admissible into the Roach. Thus, Mr. Councillor Johnson is reported to have said "it was yet questionable whether they might be allowed to turn the surface water into the river. He believed that in some towns, where it had been analysed, the rainfall for the first half-hour was found to be as bad as any sewage in the drains.

The Mayor added that "this was the case where the roads were macadamised."

It was argued that at Reading a separate system was in operation,* and that the Thames Conservators had made no objection to the discharge of the surface water untreated into the river. And, further, that an effluent passed by the Thames Conservators ought surely to cause no difficulties to the guardians of the Roach. It subsequently appeared that the analyses of rainfall which had been quoted were those of Mr. Ernest Smith, and that the samples were obtained from the London streets. We do not at the moment recall the precise nature of these experiments, but they seem to have greatly exercised the official mind at Rochdale. Mr. Heape considered that "as far as they were aware, it would be an entirely new departure to call this surface water sewage at all." Mr. Schofield, in his remarks, put the matter most clearly, and stated that the Town Clerk would be able to affirm that the question of whether or not surface water should be allowed to go into the drains or be kept out, or rather what was or was not sewage, had never been legally settled. "They had spent a great deal of time in trying to ascertain from various Acts of Parliament and other sources what was the definition, but had been unable to find any sufficiently clear definition of sewage, or whether surface water, however filthy, was such as might be passed into a river after passing through the drains."

The Mayor believed the definition of sewage to be "that which is turned into a sewer"; but to this Mr. Schofield objected that you might then "keep any filth you liked on the surface and it would not be sewage." Messrs Rawlinson and Read define sewage as "the fluid refuse of a town."

We have dwelt on this debate rather in detail, because it brings into prominence the vexed question of storm overflows, and, with all due deference to the Rochdale town clerk, we think that scores of cases can be quoted in which such overflows have been sanctioned by the Government authorities. The views of the Local Government Board upon this subject, as expressed by Mr. Rawlinson, their chief engineer, are perfectly clear and explicit. In the practical and valuable "Suggestions" drawn up by Mr. Rawlinson, and recently revised by him, we read, on page 5, "Town sites necessarily have surface-draining, and frequently there are old drains to remove surface and storm-water. If the surface-drains are imperfect they should be improved, so as to be made efficient, as the work of removing heavy falls of rain should not be thrown on new sewers," and on page 6, "It will not be desirable to construct the intercepting sewer of sufficient capacity to remove storm-water, as neither sewage-tanks nor sewage-farms will be enabled to deal with such excessive volumes of water." Many other passages might be quoted, as paragraphs 3 and 5 on page 7, but the above extracts are sufficient to explain Mr. Rawlinson's opinions. He expressly says, in the 9th paragraph of the "Suggestions," "Main sewers may have flood-water overflows wherever practicable, to prevent such sewers being choked during thunderstorms or heavy rains." It is the general practice of engineers, by means of leap-weirs, quadrant-plates, or similar contrivances, to discharge, at suitable points, the excessive flow of sewage resulting from a heavy rainfall into the nearest watercourses, and, except where a complete system of separation is carried out, no other plan can be pursued. In times of flood the river rapidly carries off the highly-diluted sewage without any evil effects, and, except that it would be well, perhaps, to determine some definite volume as a starting-point, as, for instance, some specified depth of rainfall, we see no cause for interference with the practice. It would be impossible to make one standard for the whole country, or to say, for example, that after the fall of 1in. of rain in six hours it might be legal to turn the whole of the dilute sewage into any watercourse, for the area drained into one outfall varies so greatly in extent. In the case of floods it matters little whether the superfluous sewage only is turned into the stream untreated (as Mr. Hewson proposes at Rochdale), and the balance is taken down to the farm for defecation, or whether the whole volume is passed into the river. If there were indeed causes for the uncertainty on this subject which appears to have so greatly disturbed the good folks at Rochdale, it would be a serious matter for engineers to have to plan outfall works of any kind, and the adopting of a separate system would only add fresh difficulties to the numerous impediments which already beset the solution of the sewage question.

A RESERVOIR CASE.

When water is diverted from any river or stream upon which mills or other works are situated, which make use of the fall of water for power to drive machinery, compensation for the loss of power, if given in water, must be effected by making a reservoir to store the flood waters of that or some other stream.

The compensation reservoir at Tittesworth, on the river Churnet, is so constructed that the water discharged from it is in a very unsatisfactory state as to clearness, and always has been so since the reservoir was made. It has been the cause of several actions at law, and at the recent Staffordshire summer assizes the case of Tatton v. The Staffordshire Potteries Waterworks Company was heard, and decided in favour of the plaintiff with £1,400 damages. The case arose out of the effect which the construction of this reservoir by the Waterworks Company has had on the water of the river Churnet. Mr. Tatton is a silk-dyer at Leek, about a mile below the site of the Tittesworth reservoir, and before it was made he used the river water for washing the sewing silk sent to him by the manufacturers in the neighbourhood, the water being of a very fine character, and particularly suitable for that purpose.

The reservoir was made in 1858. Mr. Tatton continued his business until the year 1872, when, in consequence of continual defects in the dyeing process his trade fell off and he was obliged to sell his property, valued at £5,000, for the sum of £3,550. So bad had the water of the river become at that time that the gentleman who bought the property—also a silk dyer—gave up his rights in the water of the river, and received from the Waterworks Company for the relinquishments of those rights the sum of £1,750. In Tatton's action the writ was dated 8th January, 1878; the agreement to sell the property was dated 8th January, 1872—six years, the period of the Statute of Limitations. Why did not the plaintiff bring his action sooner? He had become poor, and hesitated to attack a powerful Waterworks Company; but at last, his friends having urged upon him that he really had a good case against the company, he caused a writ to be issued in January last. Through some delays the trial was postponed until the recent assizes.

The original cause of the water being fouled in this case is that when the reservoir was constructed no provision was made for drawing off the water in a clear state, or for continuing past the reservoir the clear water which comes down the river at all times, except when it is in flood; and it may be useful to consider this case somewhat apart from the trial itself, and in the light of reservoir-construction generally.

Any large reservoir is usually formed by making an embankment across the stream, completely blocking it, and discharging the water through pipes, and controlling the discharge by means of valves upon them. The site of a reservoir is chosen in such a position that the area of the ground above it may be sufficient to produce the required quantity of water from the rainfall upon it. Heavy rain disturbs the soil within the drainage area and carries portions of it into the streams which flow down to the reservoir, and the mud so brought down in flood times must be dealt with there. A river or stream upon which a reservoir is made can never be restored to the same state as it was in before below the reservoir; it may be improved, both in point of volume and clearness, or it may be made worse, as has been done in the case referred to above, but to render it exactly equal to what it was before is impossible. If the mills using water-power were before inconvenienced by floods, their condition may be improved by making a reservoir wherein the floods will be stored, and if in droughts they were short of water, they may be much advantaged by a fuller flow during the working hours being discharged from a reservoir. If, on the other hand, the fish and the riparian proprietors enjoyed a great flood occasionally, and if a great flood was found to scour away from the bed of the stream the refuse which the riparian inhabitants had thrown into it, these would have some show of reason for objecting to the construction of a reservoir above them; but the conditions of the stream must necessarily be altered in one way or another.

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* We believe this to be a misapprehension.

Before the reservoir is made the mud which is brought down with the water passes off with the floods, which occur but a few times in a year, leaving the ordinary flow of the stream tolerably clear. It is not certain how much rain, measured in depth fallen, will so disturb the soil as to carry portions of it into the streams, and, indeed, the soil or the ground upon which rain falls is so variable in its character that the same amount of rain does not affect all kinds of ground alike, a smaller amount of rain falling upon tilled land being sufficient to carry soil with it into the streams than is sufficient to disturb the particles of earth on higher pasture land and bare rocks, unless the tilled land is well drained, in which case the water is filtered in its passage through the soil into the drains; but cultivated land within the drainage areas of reservoirs is not generally so well drained as it is in the lower lands, and the water for the most part runs over the surface into the streams, carrying earth with it. It would be an interesting subject of experimental inquiry, and one, moreover, of practical usefulness, to determine after what depth of rain in a given time the water running from various kinds of soil begins to be discoloured, or becomes so much discoloured as to be muddy. Water flowing from high moorlands is much less affected in this respect than is that from cultivated land, the colour of the flood waters from moorland being derived chiefly from peat, and although this is sometimes of a very brown colour it is transparent and not muddy.

An average daily rainfall in this district would be about one-tenth of an inch in depth, or from a tenth to an eighth, but this is not sufficient to detach and remove particles of soil from the land to any appreciable degree in this district. If one-tenth of an inch of rain daily were to fall regularly throughout the year, the water of the streams would be at all times clear, for each day's rain would sink quietly into the ground — that part of it at least which would not be evaporated—and the ground would again absorb its portion of the rain of the succeeding day; and so there would be a very regular flow in the streams of clear water all through the year; but when the rain falls in excess of the average for some days together the ground becomes saturated and non-absorbent, and then of that which falls afterwards nearly all runs off, and, gathering more and more water as it passes downwards, becomes a flood.

In at least one flood in this district as much as 100,000 cubic feet of water passed through the Tittesworth reservoir, to the very imminent danger of the embankment, occurring as it did when the reservoir was nearly full. There is great danger in making a reservoir too small for its drainage area, unless the waste weir be of very ample length. A reservoir should be of such a capacity that it will seldom be full.

The drainage area of this reservoir is nearly 7,000 acres. Within this area there is a reservoir belonging to the Leek Waterworks, and several millponds, all of which, to some extent, intercept the flood-waters; but, deducting all the drainage areas belonging to these, there must be not less than 5,000 acres belonging directly to the Tittesworth reservoir, and from which it receives the flood-waters unintercepted. Enormous as is the quantity of 100,000 cubic feet per minute, it is not unusually large when we consider the large drainage area from which it proceeded.

The reservoir was originally about 40 acres in extent, and the depth of water at the embankment about 40ft., but a few years ago the embankment was raised some few feet, and it is now somewhat larger; but for this drainage area it is quite a small reservoir, is soon filled by great floods, and large quantities of water pass over the waste weir.

The Staffordshire Potteries Waterworks Company, to whom the reservoir belongs, take water from some fine and copious springs which issue from the conglomerate beds of the Bunter sandstone, at Wall Grange, in the valley of the Churnet, below Leek, and to compensate the mills on the Churnet and Dove for the diversion of this water to the pottery towns, the waterworks company made a reservoir at Deep Hays, but the company afterwards requiring more water, and finding the compensation insufficient, they made this reservoir at Tittesworth in further compensation to the mills. It is about a mile above the dyeworks, in respect of which this action was brought. Water discharged from a reservoir, for power only, need not be clean; but for all other purposes, it is desirable that it should be so, and it is usual in the construction of reservoirs to make some provision by which the mud is separated from the water. It is not necessary that the water should be filtered, as for domestic use, but there are various means other than this by which the water is rendered tolerably clear at most times, and if any one of these had been adopted by the waterworks company in the first instance, when the reservoir was constructed, there would have been no ground of complaint on the part of dyers or others having interests in the river below; but no means at all were adopted to this end.

The water is discharged from the bottom of the reservoir, and consequently the water and mud are discharged together, day by day. It is quite usual in the construction of such a reservoir to draw off the water from near its surface, at whatever height it may stand in the reservoir from time to time, by means of sluices placed at different levels one above another, all communicating with the discharge pipe at the bottom. In this case the height was about 40ft., and there might well have been three sluices above the discharge-pipe, built into the walls of a tower, the top of which would be approached from the top of the embankment by means of a foot-bridge. From the top of the tower each sluice would be opened and shut in turn, as the water in the reservoir might rise or fall, so as at all times to draw off the water through the sluice nearest the surface. At the bottom there should be a sludge-pipe through which the mud would be discharged occasionally into a lodge or tank below the reservoir.

Another and a better way than this is to form a lodge for the *débris* at the upper end of the reservoir, so as to prevent its entry, and to form a channel alongside the reservoir to convey the ordinary flow of the stream, and to conduct it past the end of the embankment into the stream below, the flood waters being directed into the reservoir. This needs no manual work. When Mr. Bateman—now the president of the Institution of Civil Engineers—made the Manchester waterworks, he adopted a capital means of separating the clear from the muddy water of a stream by the action of the stream itself; and the same method has often been adopted since in other works. The fundamental principle of its action is the force of gravitation. When water flows over a weir, or out of the end of any channel where it has a free fall of some few feet, it reaches farther and farther, at any given depth below the weir or end of the channel, as its velocity becomes greater and greater. When the stream has its ordinary volume, and the water is clear, its velocity is comparatively small, and in flowing over a weir it reaches not very far in its fall. When the rainfall is heavy enough to disturb the soil on which it falls, and the stream is in flood and muddy, its volume—and consequently its velocity—is greater, and in falling over the same weir it reaches farther. Now, by interposing a shield at such a distance from the weir that the water falling on the near side of it may run in one direction, while that which reaches beyond it may flow in another direction, the clear water is turned into its proper channel and the flood water into the reservoir. This channel being continued along the edge of the reservoir into the stream below, the clear water is thus separated automatically from the flood waters.

GLOUCESTER ASYLUM COMPETITION.

THE request of the Gloucester Asylum Committee, for plans of a new Asylum, have been responded to by architects sending 28 sets of designs, some illustrated by as many as 30 drawings. The drawings are hung in the large ball-room (designed by the elder Smirk, in 1814) on screens, and every set is given a good position for examination. One cannot help remarking the immense labour and talent exhibited in these drawings.

Entering the room, the first set, "Ut Prosim Alus" (unmounted), shows a building on the American principle of echelon, with connections between the blocks. The elevations are Tudor, and the designs show no marks of originality. The next, "Perseverando," show one long straight corridor, with ends of the blocks echeloning from that, by reducing the lengths of blocks. The elevations call for no remark. "A. B. C." is planned to work from parallel corridors, and short corridors to reach the blocks; all the suggestions are provided for; but a much larger asylum is shown, the blocks echelon to the front, the two infirmary blocks are placed with their ends to the south, and a w.c., on the south, as the most prominent object. There are two engine-houses and chimney-stacks shown in this design. The architecture is of plain Gothic character, and is by far the best in the room. The chapel is a little gem, with a half-timbered tower above the roof, and shingled spire. The perspective illustrating this design is well drawn.

"Pro Bono Lunatico." This design is of the same type as the last on plan. The chronic blocks abut against the main corridor, and stop future extension. There is no through ventilation to the wards, and some of the rooms have borrowed lights. The alternative plan is shown in red. The blocks are much better designed. The epileptic block is nearly perfect, but in many respects this plan does not comply with conditions, more especially in the infirmary, where the numbers accommodated do not correspond with the instructions to architects. The elevations are of the usual suburban villa type.

"Echellone." This plan is on the American system of echelon; but the blocks, instead of being joined by the usual curved passage, have an octagonal building between each block, forming a group of water-closets and lavatories, and a connecting passage to same to connect the blocks—a most objectionable plan, stopping free play of air round the blocks, and causing the whole to appear confused. The kitchen and stores and offices are locked in between the back and front official blocks, and the visiting rooms used to receive patients are too far from the infirmary or reception-ward. The epileptic dormitory is well designed, and there are several alternatives. The whole 30 drawings show the work of a practised constructor: the elevations and a beautiful perspective show a red-brick Queen Anne type of building, nicely grouped, but too refined and costly for the purpose.

"Au Rou Droit."—This plan echelons by placing the blocks end on to a corridor, and lengthening and shortening them as required. There are some good day-rooms, but the patients have to pass through one to get to the other, and the whole plan is too confused for execution. The epileptic dormitory is the best in the competition for supervision.

"Tria Juncta in Uno" is a failure in understanding the instructions; the blocks do not echelon, but are placed in a straight line. "Vortex" is a plan with pavilions placed one behind the other, and no attempt at echelon.

"Utilitas" is an entirely different type of design. The front official block is made to contain the whole of the medical staff and committee-rooms, &c., and the back official block dispensed with. The steward and housekeeper are placed at the sides, and there is a clear drive into the kitchen court-yard; from the front official block the corridors diverge at an angle to suit the echelon, and the blocks touch this corridor at their angles. The chronic block is brought slightly forward, and the angular corridors abut against a straight service corridor in the rear; at the end of this is shown a chapel and the superintendent's house. The day-rooms and dormitories are well planned. The day-rooms are perfect in themselves; all the w.c.'s are kept to the north, and the whole of the planning is good; there is a departure from the instructions in carrying up the epileptic dormitory to first and second floor. The elevations and isometrical view show a charming light-looking structure of a Domestic Gothic character.

"Experience" is a set of plans which show what competition drawings should be. There is no perspective, but everything is fairly shown. The front and rear official is all brought into one well-designed block in centre, the dining-hall and kitchen, stores, and sculleries are grouped in the centre, with the steward and housekeeper at the sides. There are two cart drives into the kitchen and stores-court, and the laundry and workshops are placed at the side of the administrative block. Every requirement is provided for, and this block is perfect in its way. The visiting rooms are near the infirmary block and the separate staircases for matron, medical officers, and servants, and the accommodation on the first and second floor is well planned; on each side of the front block is a door giving access to a short corridor in the rear of the official block, and between that and the dining-room opposite these doors are placed the rooms for the head attendants of each sex; and from this point the corridors diverge at an angle to suit the echelon of the blocks. The infirmary block is entirely detached from centre block, and all single rooms have a southern aspect. The water-closets are all to the north, and are well planned. The other blocks have the day rooms at the ends, and in this respect are surpassed by "Utilitas," but there is good through ventilation; the weak points are the laundry, the epileptic dormitory, and the lighting of short corridors, but in other respects the plans are admirable. The elevations are a plain Gothic character, and should be improved; the alternative is of a suburban villa type. On the whole, this is a very meritorious design, and if executed would prove to be a thoroughly good asylum.

"Glory of Glevum" is a beautiful design, if not too refined for a pauper asylum; the dining-hall is placed in the centre of the south front, and the official block all grouped in one at the north. The kitchen and offices placed between this portion appear small, but there are all the rooms mentioned in the instructions. There is a door on each side of the official block for the easy delivery of stores. The corridors diverge at a very obtuse angle from the straight corridor in rear of the dining-hall, and the blocks are echeloned along this corridor with their longest sides to the south, standing quite detached, and a sufficient space from each other to get a clear angle of 45 degrees, of which the author makes a great point. Beneath this corridor is a subway, fitted with trams and lifts, and a driving-way down to supply stores and food to the various blocks. The blocks are designed as day-rooms at ends and single rooms and offices in the centre, with annexes for water-closets; some of these are to the south, in the wrong position, and should be removed. The day-rooms could not be improved, as they are each clear on three sides. The elevations are good Domestic Gothic; the dining-hall especially is a good design. The laundry and the workshop blocks are placed at the extreme ends of the corridor, as far as possible away from the infirmary; the chapel and the superintendent's house is in the rear about the centre of the corridor on each side, and is reached by a short corridor from the main diverging corridor. The plan is simple and good.

"Strive" fails in covering too little ground. It is a well-studied plan, the main corridors forming a triangle, and the accommodation sufficient. The plan does not comply with conditions, as there is no dormitory over the infirmary, and the blocks are all joined together; there are a large quantity of inclosed areas, and there is an error in the distribution of the patients, as the blocks are not arranged according to instructions, three on each side of the centre. The infirmary is designed as a reception ward, and the other blocks have no through ventilation: the design shows shafts for this purpose. The first and second-floors are better planned than the ground-floor; there are many points of construction showing merit, but the plan fails to comply with instructions.

"Spectemur Agendo" is similar to the last, but is planned on the old system of back and front official; the front official is so small as to look insignificant, placed as it is between two large blocks; the blocks are well placed on the ground, the corridors forming a triangle, the base being a straight serving corridor abutting against the end block and stopping future extension. Doors opening into day-rooms from single rooms are very objectionable in this plan; but in the chronic block the staircase to first and second floors is placed in the centre of the building, and the forty-four patients accommodated on that floor have to pass through the day-room to reach the stairs; and the twenty-two in the other day-room have to pass through it to reach the corridor. The plans comply with instructions, and are well drawn; the elevations are good, but the plan is objectionable.

"Tentenda est via—Virgil" is an echelon plan pure and simple, with diverging corridors, but does not follow the instructions in any other particular. There is a small official block, far too small for so large an asylum, in the centre of plan, and the medical superintendent's house and the chapel are placed to the south of this. The corridors diverge at an angle more acute than "Glory of Glevum," but in a similar manner to that plan, the two plans having a great family likeness; on the south side of this corridor is echeloned six small blocks, each containing a day-room and single rooms for patients. There are no attendants' rooms, the author having the idea, we presume, that the nurses should sit with the patients. The workshop, day-room, and the laundry ditto are placed to the south with the other blocks, the dining-halls, of which there are two, being placed about central on each side of the administrative block and a long distance from the kitchen, too far for service. The epileptic dormitory is placed on the first floor. This is contrary to the expressed wish of the Lunacy Commissioners, and would be rejected by them; the danger of an epileptic having a fit on a staircase must be self-evident. This must be looked at more as a medical protest against existing asylums, and a claim for minute subdivision of patients into classes, than as a serious attempt to win this competition. The great expense of so many additional staircases, and the multiplication of offices with the large additional walling, must for a long time deter committees from erecting such costly buildings. In America, where they are far before us in the care of the insane, and where asylums have cost £500 per bed, such an asylum may be possible; but here, with an average cost of £120, such a plan would not be built except by a very rich corporation. The plans are highly coloured, and illustrated by a well-drawn and artistically-coloured perspective. The elevations are as bad as they can be, being an attempt at Queen Anne architecture. This, with "Glory of Glevum," must be taken as unique in their way, and pointing to what is to come, and, as such, are worthy of study.

"Tria Juncta in Uno" (No. 2) is a plan distinct in its way as having no diverging corridors, but placing the blocks well apart, with a southern aspect to each block, the plan of corridors being somewhat like an H with the horizontal line extended, and the blocks placed at the ends of these corridors; the blocks are well designed, except the administrative block, and the instructions to architects are complied with in every respect; the laundry block is especially noticeable as a good block. The great fault of plan is the confusion of the corridors, and no main corridor that would form a leading thoroughfare. When will architects learn from the engineer who lays out towns that there must be a leading thoroughfare? Here is a good plan in detail spoiled by the want of this knowledge. There are several details of this design that may be improved: the arcade to carry the second floor over to get the extra dormitory-space would be much better dispensed with, as it would make the first floor dark, and the extra space on ground and first floors would be an improvement. The design shows a system of detached shafts for ventilation. The elevations are simple. There is no perspective sent. The remaining plans must wait for notice till next week.

ASPHALTE, AND ITS APPLICATION TO STREET PAVING.*

By E. B. Ellice-Clarke, Assoc. M. Inst. C.E.

PRELIMINARY.

THE subject of asphalte paving has been reported upon by borough engineers and treated in a few papers read during the last ten years, very ably so in the sixty-third volume of the "Proceedings of the Institution of Civil Engineers," but has never, so far as the author is aware, been discussed by a scientific society in England. Its importance cannot be over-estimated by the engineers having charge of the paved streets of the great towns, therefore it appeared the most fitting opportunity of entering into the question would be when they were assembled together as they are to-day.

Few English engineers have the time or opportunity to become acquainted with and peruse the literature of the subject, spread over many volumes in several languages; the author will therefore briefly give some particulars of asphalte before entering upon its application to street paving.

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* Read at the annual meeting of the Association of Municipal Engineers and Surveyors, August 1, 1879.

The word asphalte in England is a generic term for bitumen, and many materials and substances containing small quantities of bitumen, or mineral tar, such as the residue from the distillation of coal and heavy shale oils, and the natural bitumen from the Dead Sea (*Lacus Asphaltites*) and Trinidad; in this paper it is used only to describe the natural combination of bitumen and calcarcous matter; in other words, bituminous limestone found in the Val de Travers, Neufchâtel, and at Seyssel, between Lyons and Geneva.

GEOLOGICAL AND CHEMICAL.

Of the geological origin of asphalte little is positively known, as it appears to have escaped the attention of eminent geologists. It has been supposed that underlying beds of coal were subjected to fusion by great heat, and pressed through the superposed strata during volcanic convulsions, the bitumen or bituminous vapours impregnating and being condensed in the calcareous rock which composes from 85 to 95 per cent. of asphalte. This theory hardly seems tenable when it is found that seams of pure limestone, not containing any bitumen, sometimes intervene between the impregnated seams. The impregnated beds are of a finer texture or grain than the others, so that it would appear they were subject to greater pressure. The division between both is exact, though serrated or chipped, and in no instances do the seams of limestone so intervening contain bitumen. The faults are vertical, and there are no other fissures. The impregnation took place before the last volcanic upheaval of the earth's outer crust. It is thus difficult to reconcile this theory with the position of the rocks unless the beds were at a different angle to that in which they now lie, or the impregnated beds were composed of a softer kind of limestone. A curious fact is, that coal has not been found in the neighbourhood of the asphalte. It has also been contended that limestone, suspended in water beneath which were springs of bitumen, has been precipitated and mixed with the bitumen, though the slight affinity that exists between the two substances does not bear out this hypothesis.

Bituminous limestone, so rare in nature, contains from 5 to 15 per cent. by weight of pure bitumen composed of 85 parts of carbon, 12 hydrogen, and 3 oxygen, having a specific gravity of 1·03.

The rock asphalte is pure carbonate of lime and bitumen. The seams vary from 1ft. to 23ft. in thickness; they are convex on the upper and lower sides, the beds dip to the south, and fall from 1 in 3 to 1 in 12. The disposition and mixture of the limestone and bitumen being so complete that there is no bed or flaw, as in York stone; the seams are compact and the grain homogeneous; the colour is a rich chocolate; variations of temperature affect its consistency; it is hard and easily broken, giving an irregular fracture; the specific gravity varies in direct proportion to the quantity of bitumen, the average is 2·25 (3,874lb. each cubic yard).

HISTORICAL.

From the earliest period of the history of constructive works asphalte appears to have been used as a cement. It is claimed that the famous buildings of Babylon were jointed with it, and Dr. d'Eyrinis, who published a work on the subject in 1721, enthusiastically advocated its use for all purposes to which cement and mortar are applied; though he, and some who subsequently worked the concession, appear to have applied it chiefly to medicinal purposes by extracting the bitumen from the earth and soft sandstone, without touching the harder limestone deposits. For more than a hundred years its employment for other purposes remained in abeyance. In 1838 a trial pavement was laid in Paris, and the matter was taken up by financiers, who, not content with honestly giving the numerous uses to which it might be applied, attributed to it qualities it never possessed, exaggerated the importance of its virtues, and roundly claimed for it an adaptability to almost every conceivable object in constructive works. Speculation in asphalte became so great as to reach fever heat; panic and collapse followed, and this retarded the proper use of the material for a considerable period. It was therefore not until 1854 that the Rue Bergère was paved with the rock of the Val de Travers, compressed. It may be here stated portions of this road were removed fifteen years afterwards, when the asphalte was found to have lost 5 per cent. in weight, and the vertical depth reduced from 2in. to 1¾in. Previous to 1854 it had been laid in mastic on the Morand Bridge, Lyons.

In 1858, three sides of the Palais Royal were laid, and gave results that justified its adoption in a street of 1,000 yards in length. Here, in consequence of unfortunate results that might have been readily foreseen, the use of the material for road paving was further retarded. A large brick sewer had recently been constructed under the roadway, and the made ground extended to a depth of from 10 to 13ft. The top surface was in October prepared for the asphalte, by laying down a foundation of concrete 4in. in thickness. In November and December the compressed asphalte, 2in. in depth, was laid, and the traffic immediately afterwards turned into the street. Cracks and flaws on the surface and through the concrete soon appeared, but an examination of the subsoil proved the fact that the made ground was insufficiently settled; this was attended to, the cracked asphalte removed without the stoppage of the traffic, and the road has remained good to this day. Public opinion soon demonstrated the popularity of this kind of pavement, and the areas so treated have increased every year. In 1867 the Paris municipality agreed to take up 24½ acres of stone-pitched pavement, and replace it with asphalte. The war of 1870 stayed the completion of this great undertaking; in addition, the administration became exceedingly poor, and, having on their hands the accumulated stock of pitchers, it is not surprising that new asphalte pavements were for a time discontinued. In December, 1875, upwards of 300,000 yards super. of roads were paved were paved with asphalte, while in December, 1876, this area had increased to 400,000 of roads, and 1,800,000 square yards of footways.

In the municipal budget of 1875 £41,200 was voted for the maintenance and restoration of these roads, and in twenty additional streets asphalte was laid, in most cases replacing stone-pitched roads, in two replacing wood, and in others macadam.

These large areas so paved in Paris naturally attracted the attention of English engineers, and in May, 1869, 485 square yards,was laid in Threadneedle-street, London; since that date this area has been added to yearly. In February, 1879, Colonel Haywood, the City engineer, reported that "nearly every portion of the arterial lines of thoroughfare in the City was paved with wood or asphalte, and many of the secondary streets also." The figures being,

Lineal yards.		Material.
11,299	..	Asphalte
11,164	..	Wood

Equal 12$\frac{8}{10}$ miles.

In December 1877 the Val de Travers Company had laid 85,000 square yards in the metropolitan roadways, while in Vienna, Berlin, and other Continental cities, many thousands of yards have been put down.

In 1838 inquiries were set on foot by engineers, and analyses made, showing the composition of asphalte to be bitumen and limestone. As these substances could be obtained in abundance and at moderate cost, attempts to combine them artificially were made, and have continued from that time, in the author's opinion, with little success; where toughness is required, or great pressure exercised, or heavy wear by attrition, no artificial composition of carbonate of lime and bitumen has proved equal to the natural rock.

The history of the extraction and manipulation of asphalte shows the steady development of the means whereby its production is cheapened and its application improved. Where formerly the rock was obtained in small open cuttings at the surface, it is now mined for under the guidance of skilled engineers. Manual labour has been superseded by mechanical apparatus.

In the earlier stages mastic only was used for paving; boiled on the spot at which it was laid. The incident of the road traffic of the mine grinding down under the summer heat and hardening the mineral surface led to the application of pressure to the powder; but largely improved as are the means used in this industry, there is a wide field open to engineers in devising a mechanical method of compressing the heated powder.

QUARRYING, TREATMENT, AND MANUFACTURE.

The rock of the Val de Travers and Seyssel used to be obtained only when it cropped to the surface, but the great demand for the material has led to the seams being worked in galleries under engineering supervision; at the former place the adits are driven from the face of the mountain; the road is about 7 or 8ft. in height, and the roof and sides have to be bratticed. Most of the rock is obtained by blasting; the shot-hole is drilled with a breast auger; the charges are small. Fine dust rock is used for tamping, and the plug and firing are as for other rock-blasting operations.

TREATMENT OF COMPRESSED ASPHALTE.

The rock is brought to England, and stored in the open; it is then thrown into a steam crushing machine. This mode of breaking up the rock answers in every respect, except when it contains an abnormal amount of absorbed moisture. This occasions the crusher to clog, and it has to be frequently cleared. The material, now reduced to about the size of a walnut, falls on a shoot, at the bottom of which passes an endless chain of buckets that carry the material up to the hopper feed of a Carr's disintegrator, which is driven, one shaft at 1,000, the other at 700 revolutions a minute. It then drops to the ground, and is ready for heating. This is accomplished by placing it in revolving cylinders of about 5ft. diameter, above a coal fire, the cylinders making about one revolution in two minutes. Each charge consists of about 2½ tons, and takes from two to three hours to attain the requisite temperature, which is according to the amount of vapour required to be driven off. All this work is accomplished by the judgment of the workmen. No hygrometrical test is made to ascertain the amount of moisture in the cold powder, nor is the heat in the cylinders taken by a thermometer. The state of the powder differs according to the weather, and there would be great difficulty in making any scale for determining the time or heat required for "cooking." Great care must be taken to prevent it calcining, and if it is not sufficiently heated it will not adhere enough by compression to give the surface when laid a hard face; if overheated, the bitumen is fused, and little but limestone is left. As a rule, the mass attains a temperature of from 220° to 250° Fahr. At the latter point it may remain in bulk four or even five hours, and be fit to lay, the close compact nature of the powder retaining the heat for a very long time. From the heating cylinders it is taken on to the works for laying.

APPLICATION—METHOD OF LAYING BY COMPRESSION.

Although there are some roadways paved with mastic asphalte, it would appear this is not so suitable a material as compressed asphalte, which more than any other class of pavement requires a rigid foundation. This cannot be insisted on too strongly. Asphalte, being elastic, follows the subsidence of the foundation, even in so small an area as a few inches square. In this respect its failure of surface is different to that of a sett, which acts independently, unless it is kept up when placed as a voussoir. The substratum should be made hard and compact by ramming. If convenient, the Manchester method of laying down cinders and other hard material, and turning the traffic on it, might be adopted. The concrete should be regulated according to the weight it has to bear. The standard of road burdens adopted by Mr. Deacon, of 100,000 tons per annum per yard of width, is a convenient one, and all road calculations should be reduced to this. In the Rue St. Honoré the concrete was 5·9in. in thickness; in the Rue des Petits Champs it was 4in. in thickness. This road, as has been already mentioned, went to pieces from defective foundation, and probably the slight bulk of concrete had something to do with its failure. In Paris rarely more than 6in. in depth is laid. Cheapside, laid in 1870, with a then traffic of 400,000 tons per annum per yard of width, had a foundation of 9in. in thickness; after seven years' wear it was reported as being in good condition, with slight undulations of surface. Gracechurch-street, with 603,000 tons per yard of width per annum, had also 9in. in thickness; while other streets, with less traffic, had 6in. Moorgate-street, with upwards of 6,000 vehicles per diem and 264,000 tons per annum per yard of width, had a foundation 6in. in thickness; all these latter streets have maintained their surfaces in good condition. This would go to prove that under the heaviest traffic

9in. is a sufficient depth, while 6in. is sufficient for 250,000 tons per annum per yard of width.

The concrete should be gauged, six of aggregate to one of Portland cement bearing a very high tensile strain: on no account must lime concrete be used. For the best method of making Portland cement concrete for street foundations, see p. 10, paper by G. F. Deacon, "Excerpt Minutes of Proceedings of the Institution of Civil Engineers," Vol. LVIII.; the author only wishes to add that is hardly possible to make the concrete too dry. When the mixture is taken in the hand it should feel slightly moist, no water should exude when squeezed, but a slight sweat only; a few particles should adhere to the hand.

Whether a chemical change is set up or not by the contact of the asphalte and lime has not yet been determined, but practice has given sufficient experience to show that lime concrete ruins compressed work. A portion of Holborn was laid with a lime concrete foundation. The night before the asphalte was laid down a fire occurred in the vicinity, and the concrete was trampled over and injured, the holes were filled up with lime mortar, but the work was open only a short time when it became apparent it would not last. Time after time it was repaired, only to again break down under the traffic. The company, finding the annual cost of repairs very great, stripped the asphalte from the concrete, which appeared hard in places, but generally was very soft. Twenty-four hours after the hard concrete was exposed to the air it became granular and quite unfit for a foundation; it was removed and replaced with Portland cement concrete, and the road has remained good to this day.

And here one of the difficulties in all classes of pavement requiring artificial foundation arises. The cement to be of a high quality must be slow setting, and, as asphalte must not be laid on the concrete until perfectly set—otherwise, as it forms an air-tight covering over the concrete, the latter would never attain its maximum hardness—the concrete must be laid at least four days, with a temperature of 50° Fahr. and fine weather.

The French engineers bind the asphalte contractors to open a certain portion of the roadway in eight days. Practice in London shows that four days is not too long a time to allow the concrete to set. To expedite this work, the author suggests the trial of bituminous concrete as laid by Mr. Deacon. If, as described by this engineer, the surface of bituminous concrete "will bear in a few hours any amount of ramming without distortion," the work of laying compressed asphalte would be expedited by three days. In all cities of great traffic, where every twenty-four hours is of importance, such a trial should be made. The concrete must be smoothed off to the exact contour of the finished surface; the transverse fall should be not more than 1 in 30.

The asphaltic powder is now brought on to the spot in open carts, and spread tranversely across the streets in widths of 3 to 4ft.; the powder when reaching the ground should be uniform in temperature, and not less than 150° Fahr.; when leaving the works at which it is heated a maximum of 140° and a minimum of 115° Fahr. are allowed, according to the distance it has to travel; all the natural moisture eliminated. The powder is spread out in a thickness of two-fifths more than the specified compressed section. It is raked with regularity as to thickness and width over the concrete; this operation can only be accomplished by skilled men, and must be carefully attended to, otherwise the powder, if left in unequal thicknesses, will be unequally pressed. No mechanical system of spreading the powder has hitherto been successful; a steam appliance that would accomplish this object is still a desideratum.

The powder is then rammed over all by heavy punners, heated in portable furnaces to a proper temperature to prevent adhesion; at first the ramming should be done very carefully, and the blows should be light, so as to insure equality of material; the force should be gradually augmented until they are delivered as heavily as possible.

Those parts abutting the stone curbs and coal-plate curbs and cills are beaten and seared over with a T tool, as the punners are of too large diameters to reach the angles. Ramming or compressing the powder may be considered the crucial, as it is the culminating, point of its application.

The great difference in the muscular efforts of the workmen has always been a difficulty, and engineers have not been idle in searching for a method of compression by steam machinery. A steam hammer moving on temporary rails was tried, but the practical difficulty of laying the rails, especially for the side areas, rendered it abortive.

A steam roller was next applied, but, instead of compressing and laying the powder, it was driven forward in a wave, and the cost of applying the power was great when compared with hand labour. The face of the roller was kept to a high temperature to prevent adhesion. The last method of finishing of the compression has been by having a roller of several rings, which traverses the road transversely and longitudinally. This has not been largely applied; the most frequent method is to sear the surface with a smooth curved iron or smoother after the whole has been compressed with the heated punners. A straight edge, 7 or 8ft. in length, is then drawn at random over the face of the work, and inequalities of surface are shown by scratches; where these appear the face is beaten down to the required level. When the asphalte has cooled to the temperature of the atmosphere it is thrown open to the traffic.

(*To be Continued.*)

CHEAP INTERNAL TRANSPORT.

In his inaugural address on Tuesday at the summer meeting of the Institution of Mechanical Engineers, held at Glasgow, the President Mr. John Robinson, of Manchester, took for his subject "Cheap internal transport considered as a necessity for the prosperity of the country." He said no one would doubt that railways, as affording the means of cheap transport in this country, played a most important part in creating that enormous development of manufacturing industry and commercial activity which signalised the years following the establishment of this method of transport in Great Britain. During the last twelve months we had passed through an almost unexampled period of commercial and agricultural depression, and it seemed reasonable that we should look everywhere for means, if not entirely to remove, at least to palliate, the effects of this disastrous state of things. In so looking we should, not unnaturally, address ourselves to that section of the community whose ingenuity was exhibited in the works of our Watts, our Stephensons, our Smeatons, our Brindleys, and our Brunels, together with many others who were fortunately amongst us, and ascertain whether by their aid we could not take a similar step in advance, and thus, by a still wider extension of the means of cheap communication, facilitate a return to a more prosperous state of things. Many of them would probably have arrived at the conclusion that a much greater extension of the railway system as a means of making commercial profit was not to be expected, and therefore, if our more thinly populated districts were to be placed in more easy and more advantageous communication with those localities to which they must look for a profitable outlet for their commodities, and a more economical supply of their material wants, they must hope for the provision of cheaper methods of creating and maintaining these relations than those which had been adopted by more populous regions. Efforts in this direction had been and were still being made by the construction of cheap narrow gauge railways for country places, and by the adoption in town of systems of tramways, the latter rendered necessary, not by the sparseness of the population, but by the obligations imposed by frequent stoppages, and the difficulties of carrying on ordinary railway traffic in our crowded thoroughfares. In reference to the first of these necessities, it would seem possible to utilise, as in the case of the Mont Cenis mountain line, the sides of the existing roads. These frequently presented considerable spaces not required for the present traffic, and in other places the road boundaries were so cumbrous that the area they occupied would, in many instances, afford room for a narrow gauge railway, bounded by a fence of iron. The question immediately arose at whose expense such railways were to be laid down and worked, and he would suggest, in reply, that we must look to the counties in which such roads were to be established, to the landowners whose property would thereby become more valuable, and possibly to trusts corresponding to our old turnpike trusts, which, with the assistance to which he had alluded, and with loans of money at low rates from the Government, might construct such railways, and reimburse themselves either by tolls authorised at the creation of the trust, or by assessment of rates over the district benefited. Consideration must next be directed to the engineering part of the subject, and on this point he would rather attempt to throw out suggestions for reflection and solution by more experienced and wiser heads than propound theories which would be, by the circumstances of the present occasion, placed beyond the region of discussion. The first engineering question would naturally be the roadway. On this point, the two elements of first cost and efficiency would probably present the usual occasion of conflict between the engineering and the commercial sides. But it must be borne in mind that the whole beneficial results would depend in a large measure on the difference between the cost of traction on the new road, as compared with that on the existing roads. To this the consideration of first-cost ought to a certain extent to be subordinated. It might be assumed as a recognised fact that the frictional resistance to a train on an ordinary railway was about 8lb. to 12lb. per ton of the gross load, varying slightly according to speed; while this resistance on the best form of tram rail was at least 15lb. per ton, and rose to 22lb., 26lb., 40lb., and even to 45lb., according to the form of rail employed, and the condition of the road. It seemed to follow that for all iron roads formed alongside the common roads, where crossing of the rails by ordinary vehicles need only be provided for at considerable intervals, the common rail form and not the tram form should be adopted. With regard to the power to be used for haulage on these light railways, it would be necessary to take into account the special circumstances of the line and neighbourhood before deciding this point. Where the traffic was likely to be considerable and fairly continuous, while as respected the road the curves were not too sharp nor the gradients too severe, steam traction might be advantageously employed. As it had been stated, whenever a tram or railway was fairly level and tolerably free from curves, a load which would require two horses to draw it could always be more economically worked by steam power than by horse power in the proportion of 6d. to 8d. per mile: while in all cases where one horse could draw the load, traction by horse power would be cheaper than by steam power. Upon such railways as had been referred to, and where steep gradients occurred, it seemed probable that horse traction would be more economical than that of steam, inasmuch as horses for the purpose of starting loads and drawing them up hill gradients were able to develop a considerably higher power than that nominally attributed to them, and recovered from these short efforts by more easy traction on the levels and the comparative rest on descending gradients, while it was evident that an engine must have a power equal to the maximum effect required, and therefore possessed a tractive force and a corresponding weight during the whole course of its journey, when, in fact, the necessity for its full development might exist only for a very small proportion of the journey. For the undertakings to which he had referred a very considerable supply of capital would be required, and to that extent the plethora now existing would be abated. Another advantage would be the demand for engineering talent, material, and labour that would be created, and the lack of which was acutely felt at the present time. The establishment of such communications would also cheapen supplies to the consumer, and bring a larger demand for his products to the producer, and thus tend by a more prosperous interchange of commodities to give a much-needed impulse to the general trade of the country.

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The foundation-stone of chancel to St. Philip's church, Birchencliffe, near Huddersfield, was laid in July last. It is to be 23ft. by 18ft. with organ chamber and vestry attached 20ft. by 11ft. 6in. The whole is being carried out by local men. Mr. Crofts of 7, Cook-street, Liverpool, is the architect, under whose superintendence the nave and tower of church was built about three years since.

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COTTAGE HOME SCHOOLS AT BANSTEAD.

How best to train and educate pauper children thrown upon the hands of the State is a question which has for a long time been the subject of debate. This class of children are, by reason of their inherited physical and moral constitutions, breeding, and associations, of all most in need of careful training and treatment to fit them to take their places as self-supporting members of society; but their circumstances and surroundings are such as to render it least likely that they can obtain it. It resulted from this, that at one time it was no uncommon thing for paupers to regard the Union-house as their ancestral home, and several generations of one family might be found under the shelter of the same workhouse roof. It has been recognised, however, that it is the duty of the State, if only on the low ground of economy, to put an end to the perpetuation of a race of paupers; but the task is one of great difficulty, and with regard to the best means to be adopted, opinion is much divided. At present there are in England alone upwards of 47,000 children maintained by the Poor Law authorities. Of these, some are inmates of workhouses, some few are boarded out with the families of labouring people, and a large number are kept in what are called district schools—buildings erected and maintained by the guardians of several parishes or unions united to form a school district. There can be little doubt that, except in cases of large parishes or unions where the number of children is sufficient to warrant the provision of a separate school and the employment of an efficient staff of teachers, the education and training of the children are more efficiently carried out at the district schools than at the schools maintained by the parishes within the walls of their respective workhouses. The establishment of the district schools was a great step in advance; but those who have been brought into connection with children trained in these large barrack-like institutions are generally agreed that in the result something is still lacking. The machine-like and unsympathetic manner in which everything must almost necessarily be done in a school of, say, 1,000 children has apparently the effect of crushing the individuality of the child. The physical training may as a rule be said to be successful, the education (using the word in its more limited sense) sufficient; but the cultivation of individual character and the moral and mental faculties appears to be out of the question. To meet this acknowledged deficiency in the pauper schools as at present constituted, the organisation of schools to be in future erected on the village system has recently been encouraged by the Local Government Board. In February of last year Dr. Mowatt, inspector, and the late Captain Bowley, an officer of the architectural department of that board, visited the few institutions which have been established on that system in this country, and their interesting report upon the subject has been printed as a Parliamentary return. The first village of any size erected by the Poor Law authorities will be that at Banstead, Surrey, now being built from the designs of Messrs. A. and C. Harston for the managers of the Kensington and Chelsea School District, a view and plans of which appear among the illustrations of the present number. The site of this village is a long strip of ground comprising upwards of 27 acres, adjoining on one side the Epsom Downs Branch of the London, Brighton and South Coast Railway. The subsoil is chalk, and the land stands high and commands extensive views of the varied scenery of Surrey. There are no less than 33 detached buildings in course of erection, principally ranged along the sides of a road running east and west, where double avenues of trees will be planted, and footpaths with grass margins formed upon each side of a central roadway. The aim of those who advocate the village system is to supersede the "Institution" by the Home, and accordingly in the Banstead School the children are to be divided into groups of 20 girls and 32 boys and lodged in separate houses. In connection with the industrial training should be mentioned the clothing stores and needle-room, which form a separate building, where the clothing will be cut out and made up by the children, instructed by a needle mistress. On the right-hand side, near the entrance, are the probationary houses for boys and girls respectively, divided by the medical officer's office and dispensary. Here children are detained for a few weeks on their first introduction to the village as a precaution against the introduction of disease. On the left is the porter's lodge and the superintendent's house. The building immediately facing the entrance is the officer's house for the accommodation of the school staff and others not immediately attached to the homes; and at the rear of this, and connected by a covered way, is the bakery and general store. To the right of the officer's house, and on the main avenue, is the chapel, designed to seat 400 persons. It has a square chancel, flanked by a vestry and organ chamber. The roof is in a single span of 40ft., and has moulded king-posts and tie-beams bearing upon the walls of dormers. The parts of the roof between the dormers are continued to a lower level, and there are carved and moulded braces above and below the tie-beams, giving the lightness and effect of a collar roof. The inter-spaces are filled by matched boarding in panels. In a corresponding position, on the left-hand side, is the school for the elder children, planned for the accommodation of 250 boys and 150 girls. The central school-room is 68′ by 26′, and 19ft. in height, with ceiled roof and wrought and stained trusses with curved braces. In addition, there are 7 large class-rooms and a library, and separate entrances for boys and girls, with cloak-rooms, &c. The infants' school building, for 100 children, is immediately opposite the general school, and consists of a school-room with a large gallery and a babies' room. The boys' homes are placed on that part of the main avenue which is to the right of the entrance, and the girls' homes to the left. On the extreme left are two detached infirmaries, one for infectious diseases and one for the treatment of ordinary complaints. Each of these infirmaries has a centre or administrative block, and two wings consisting of four wards, and, in fact, forms a separate hospital, with its own kitchen, laundry, &c., complete. The village is to be lighted by the Epsom Gas Company, and supplied with water from the Sutton Company, whose mains are constantly kept at sufficient pressure to supply the eight hydrants which will be laid down for protection from fire. The sewage is dealt with by water carriage, and, being conveyed to the lower part of the estate, is there screened and disposed of by irrigation. The material for the buildings is brought on to the ground by means of a siding from the London and Brighton and South Coast Railway, temporary lines of rails being laid down through the length of the main avenue; and the trucks are unloaded wherever the material is required. The buildings are erected with stock bricks laid in selenitic cement, with white strings and dressings, and the roofs are covered with red tiles. Messrs. Harston have here, as in other large Poor Law buildings recently erected by them, made a great speciality of Portland cement cast concrete. The window-sills, lintels, steps, thresholds, copings, and chimney terminals are all formed of this material, and the baths, lavatory troughs, and road gullies are to be formed in like manner. Among other specialities may be mentioned the balanced ventilating heads to the windows, long narrow flags in the head of the window-frames, on the principle of the Sherringham ventilator, which may be used without interference with the blinds, as also the treads of the staircases, which are formed of teak and made reversible, so that all four edges may be worn, and ultimately the tread renewed, without affecting the structure of the staircase. The lavatories are arranged on the trough and jet system, which is found to be a great safeguard against ophthalmia by preventing the use of the same water by more than one child. Each house is supplied with hot water, and the temperature of the lavatory jets may be regulated at will. The w.c.'s are entirely detached from the houses, and all internal waste-pipes discharge over surface channels leading to earthenware or concrete traps, and are carried up through the roofs to secure ventilation. The total number of beds which the buildings will accommodate under the existing regulations of the Local Government Board as to floor and cubic space is 680. The contract for the whole of the buildings and fittings has been taken by Mr. William Crockett at £57,200, and the works are being carried out under the superintendence of Messrs. A. and C. Harston, architects, of 15, Leadenhall-street, aided by Mr. G. March, their clerk of the works.

NEW BANK AT SUDBURY.

This building is now in course of erection on the Market-hill, Sudbury, Suffolk, for the banking firm of Messrs. Alexanders and Co., from the designs of Mr. Brightwen Binyon, of Ipswich, A.R.I.B.A. The front will be faced entirely with red brick of local manufacture, and the roof covered with plain tiles of a dark tint. The banking-room will be finished with panelled wood ceiling, and the fittings will be of wainscot with teak panels. Messrs. Grimwood and Sons, of Sudbury, are the contractors, and the estimated cost of the building, including fittings, is £3,011.

ROW OF LABOURERS' COTTAGES—"BUILDING NEWS" DESIGNING CLUB.

These cottages are by "S" in a Circle, whose design we placed first in our last award. Both plans are given, with an elevation of the front, as well as a perspective sketch. "Motto J.'s" design was a good second, and we regret want of space will prevent the publication of his plan.

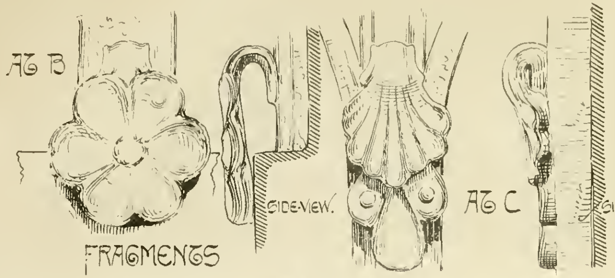
VILLA AT ASCOT.

This house, which occupies a very fine position overlooking the race-course at Ascot, contains: dining and drawing-rooms, each 22ft. by 16ft., exclusive of bay and turret, each of which are 9ft. across—with French casements opening on to lawns. Library, lavatory, &c., &c., servants' hall, kitchen, and good offices, cellarage, &c. Principal and back staircases, seven good bedrooms, bathroom, hot and cold water, w.c., &c., on first-floor. One attic and large box-room, &c., in roof. Two of the bedrooms on first-floor are in connection with back-stairs for accommodation of servants. The conservatory is not yet erected. The walls of ground story are of 18in. brickwork, built hollow with stone dressings, and those of chamber-floor of brickwork weather-tiled. Roofs are covered with plain brown tiles. The works have been carried out by daywork and small contracts for several minor trades by the owner, J. Ashby, Esq., from designs and with the assistance of Mr. R. Adolphus Came, architect, of 27, Mecklenburgh-square, London, W.C., at an outlay of £1,700. The grounds have been laid out and planted by Messrs. Standish and Co., of Ascot.

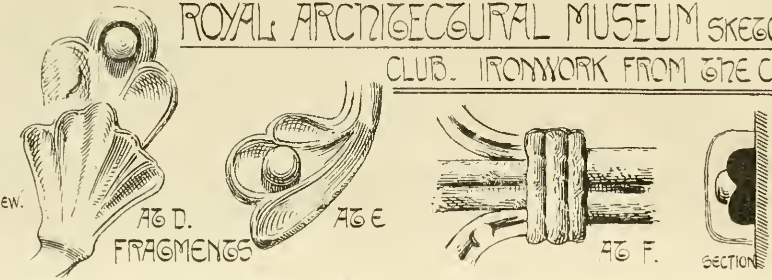
FRAGMENTS OF GOTHIC IRONWORK—ROYAL ARCHITECTURAL MUSEUM SKETCHING CLUB.

These fragments of English wrought-iron work are drawn from specimens at the Royal Architectural Museum, and illustrate detail of the most beautiful character, and suitable treatment for the material employed. The drawings are by Mr. T. Fredk. Pennington. On Saturday last an excursion for sketching was made by the members of the club to Putney for the purpose of sketching the fine old red brick mansion in the High-street, known as Fairfax House. The previous sketching excursion was to Waltham Abbey; and the next will be held on Saturday, the 30th inst., at St. Mary Cray, Kent.

ROYAL ARCHITECTURAL MUSEUM SKETCHING CLUB. IRONWORK FROM THE CAST



FRAGMENTS



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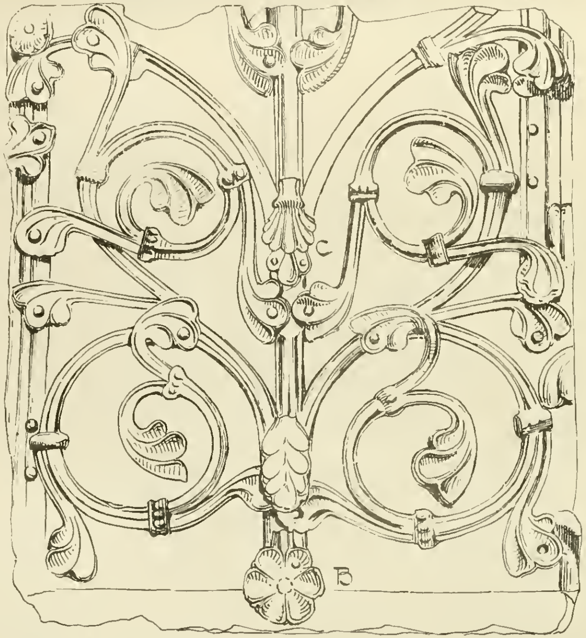
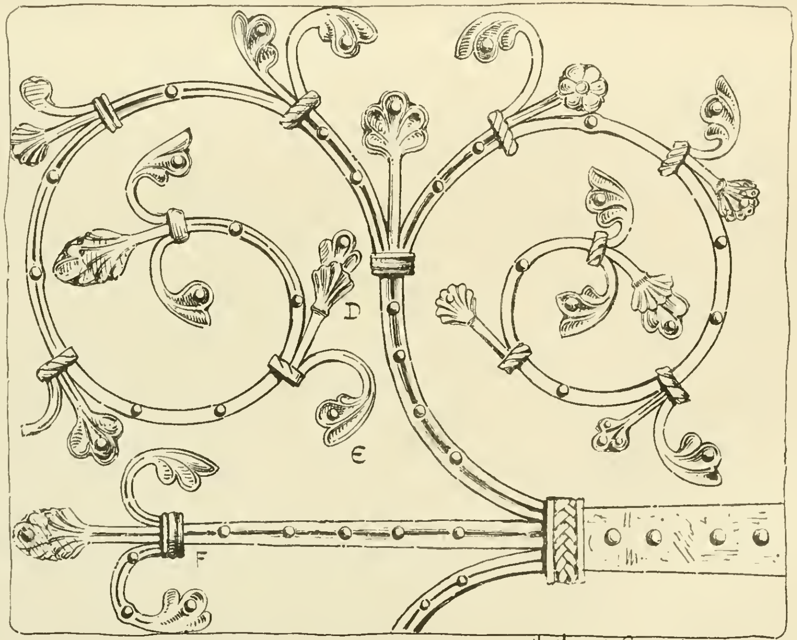


PART OF IRON GRILLE FROM QUEEN ELEANOR'S TOMB. WESTMINSTER ABBEY



PART OF IRON HINGE

J. Fredk. Pennington. del: Jan. 79.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square W.C.

New·Bank·Premises·for·
Meſſrs·Alexander·Birkbeck·Barclay·&·Buxton·
Sudbury * Suffolk *

B·BINYON·ARCHITECT·
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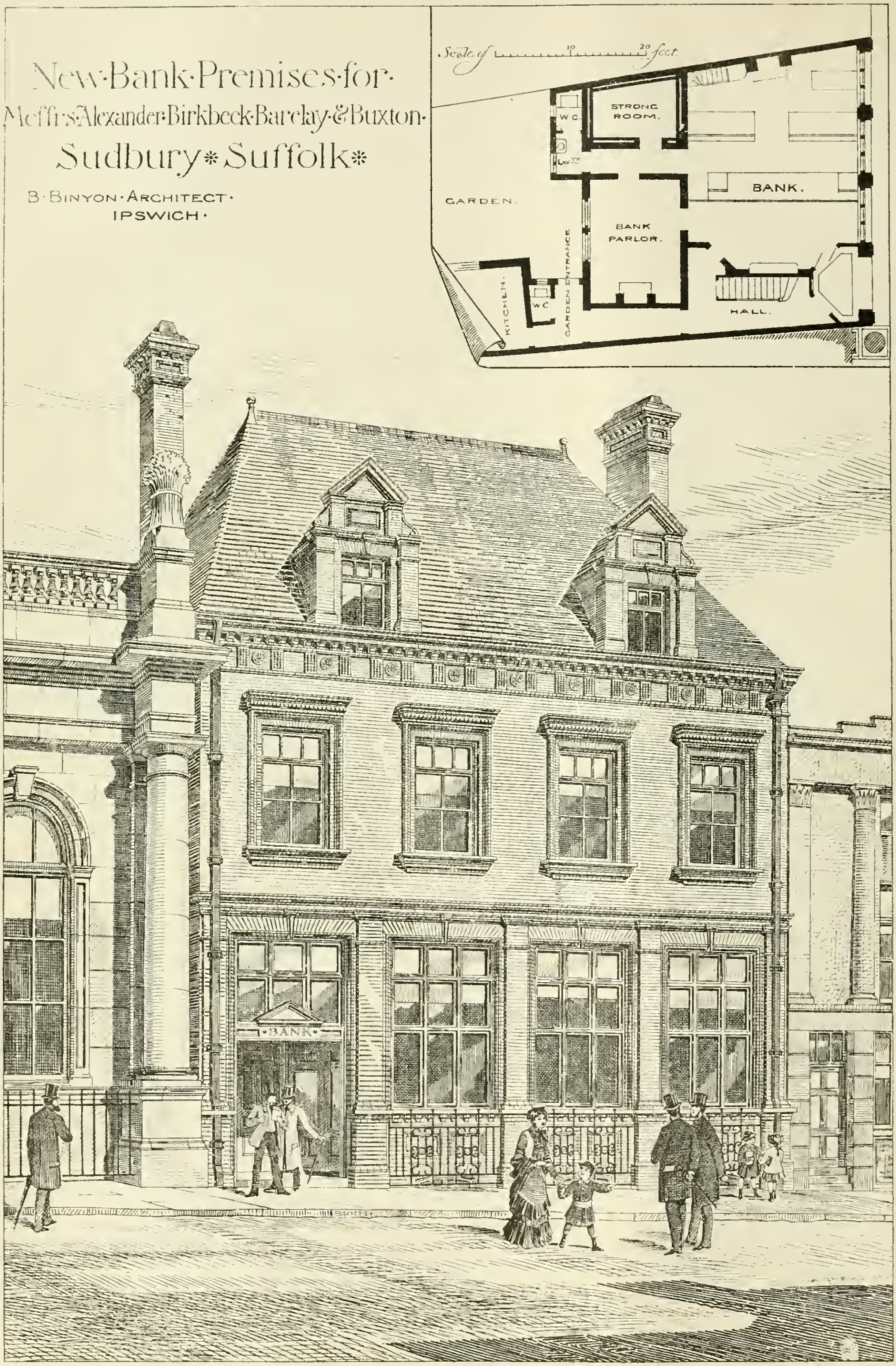

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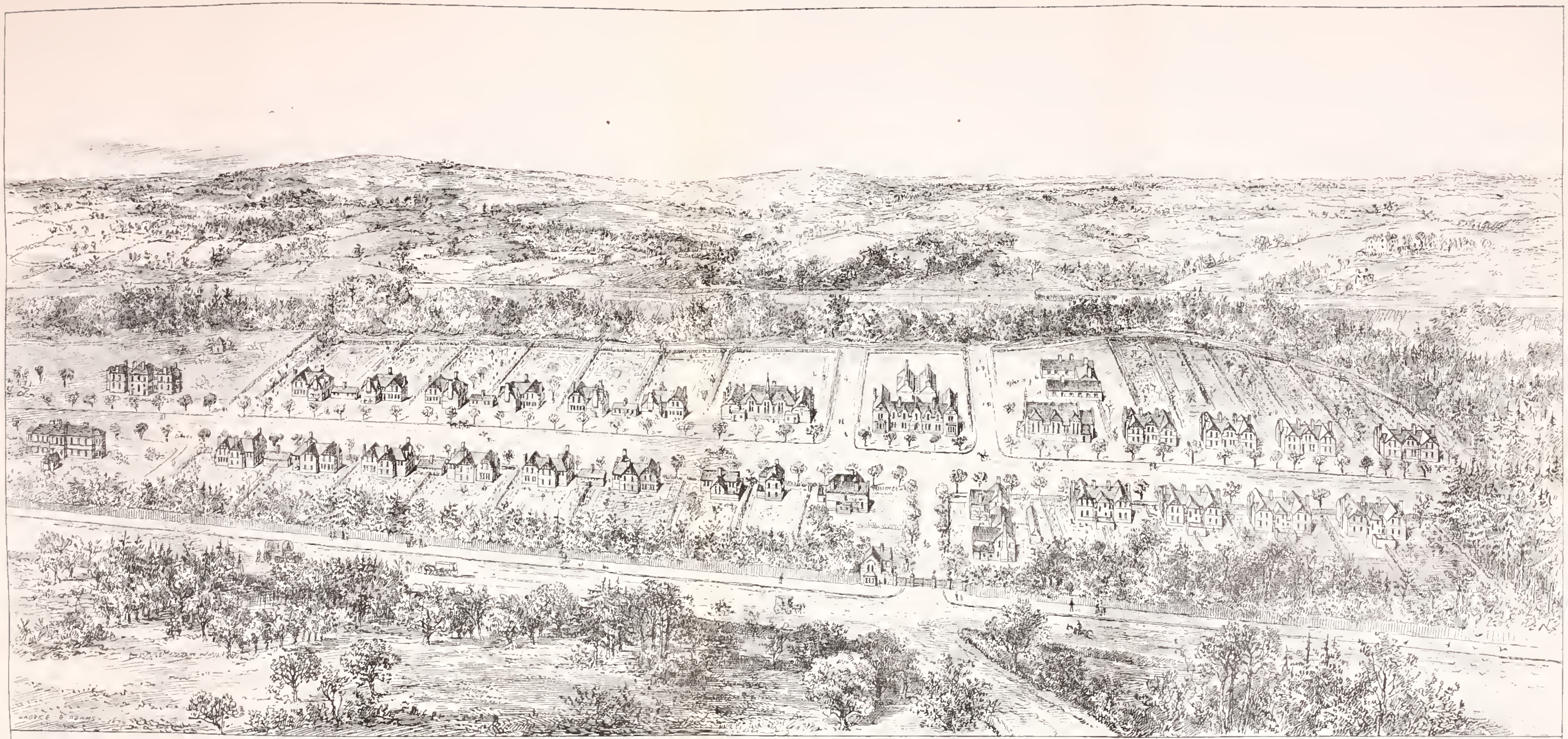
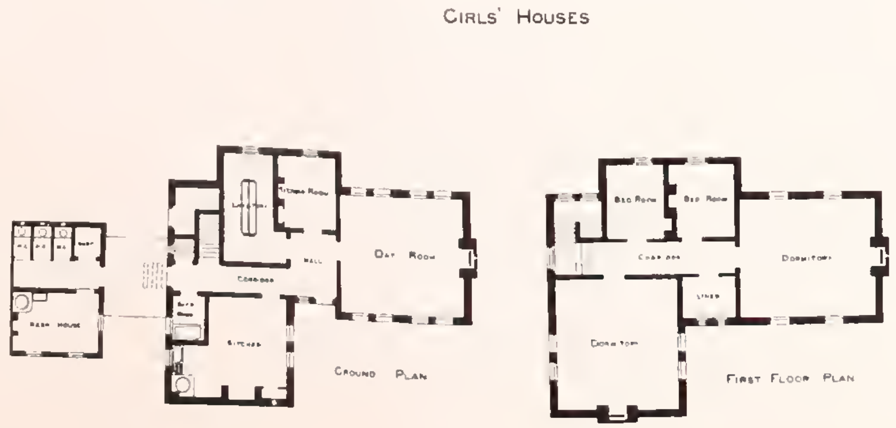
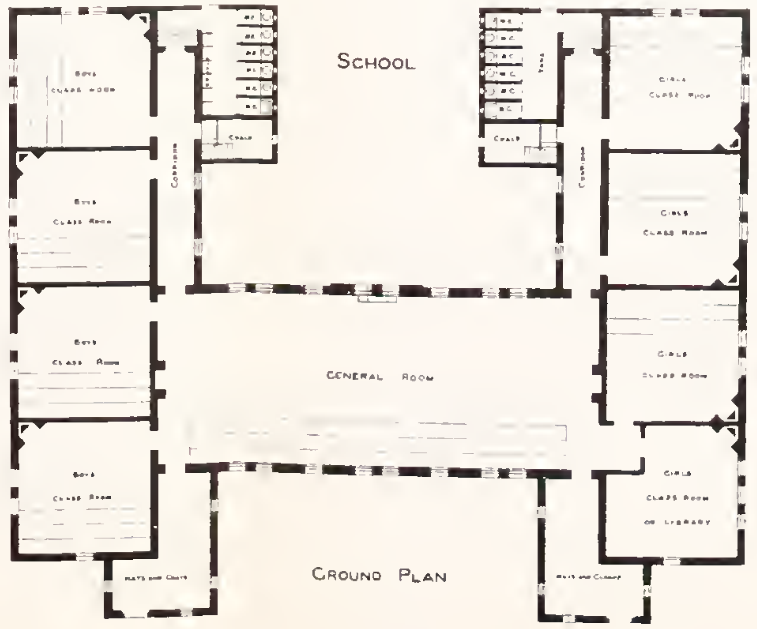
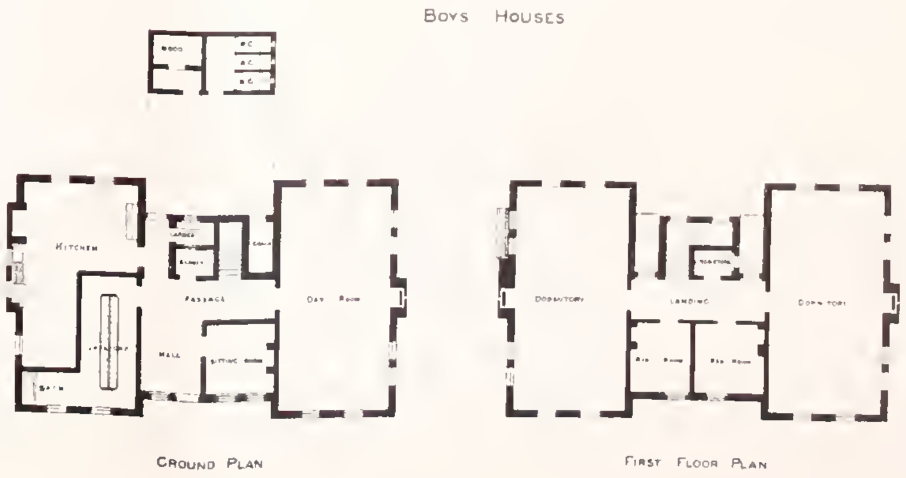


THE COTTAGE HOME SCHOOLS FOR PAUPER CHILDREN AT : BANSTEAD : KENSINGTON AND CHELSEA SCHOOL DISTRICT *Messrs A. & C. Harston Architects* 15 LEADENHALL STREET, E.C.







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Building · News · Designing · Club :

Row · of · Labourers' · Cottages :

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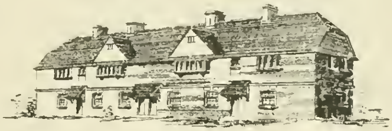

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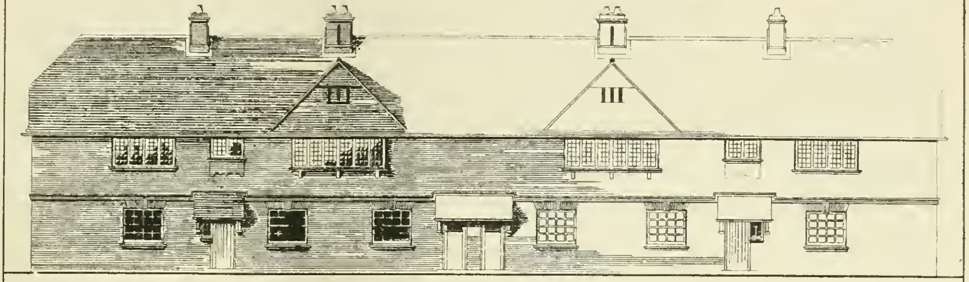

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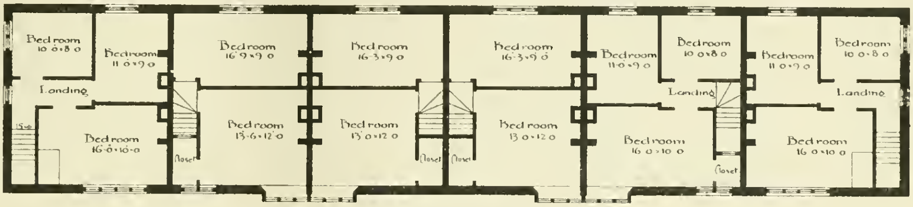
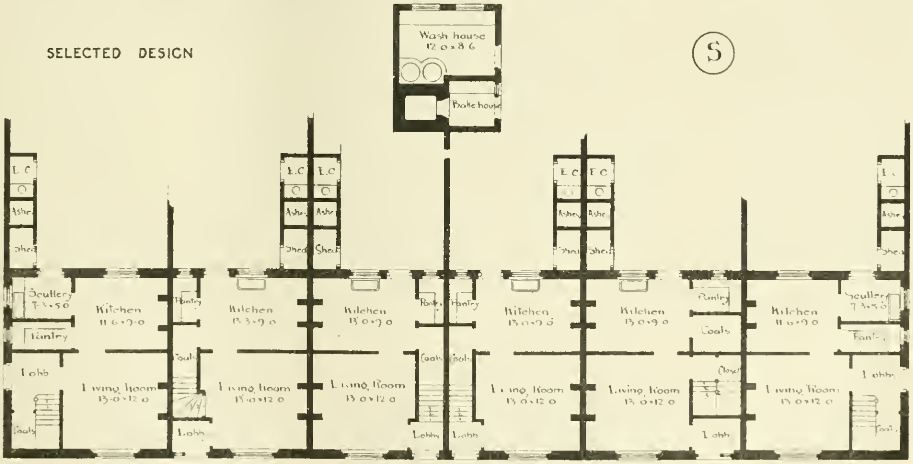


Chamber · Plan :

SELECTED DESIGN



Ground · Plan :

"BUILDING NEWS" DESIGNING CLUB

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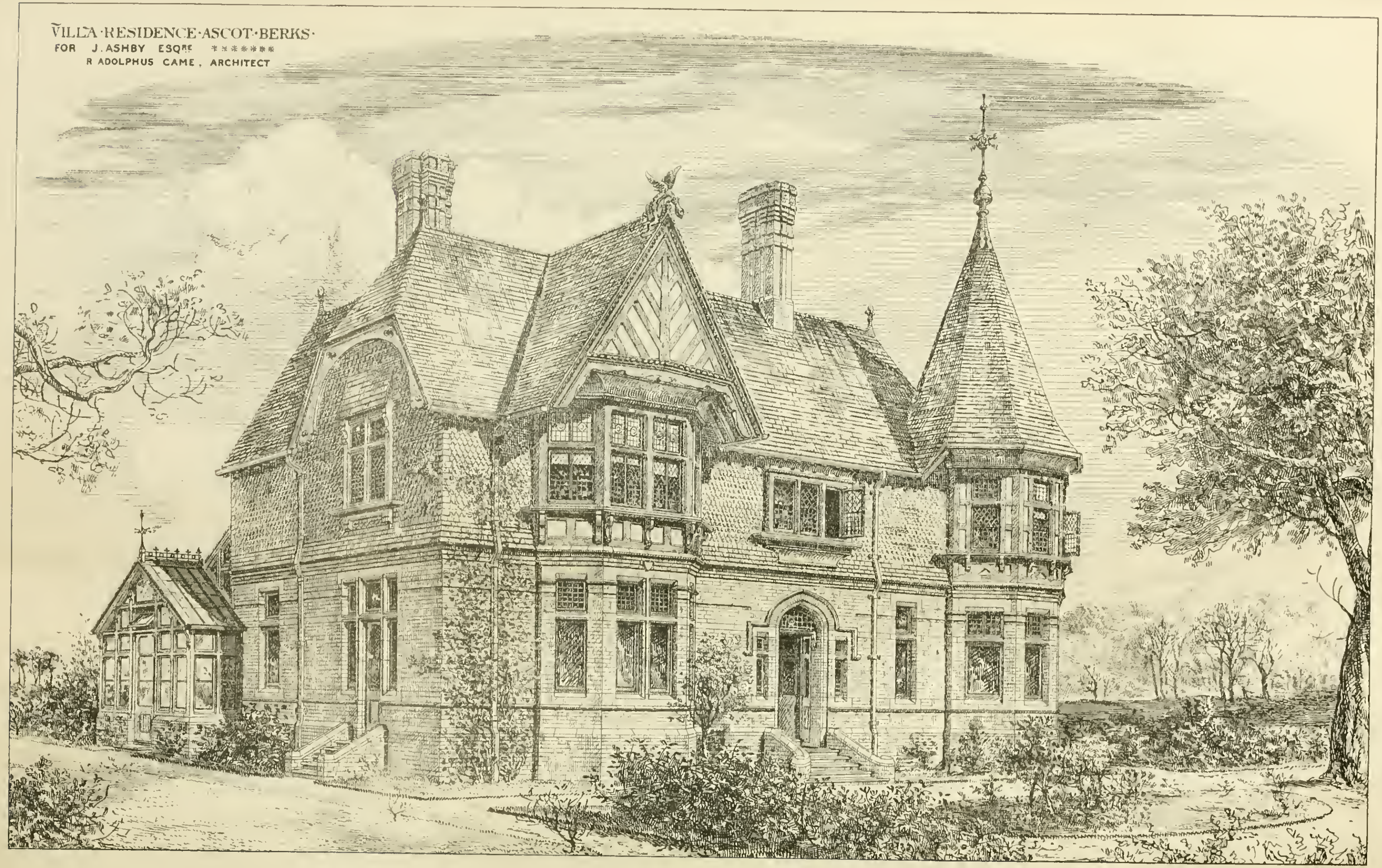


VILLA·RESIDENCE·ASCOT·BERKS·
FOR J. ASHBY ESQRE *******
R ADOLPHUS CAME, ARCHITECT

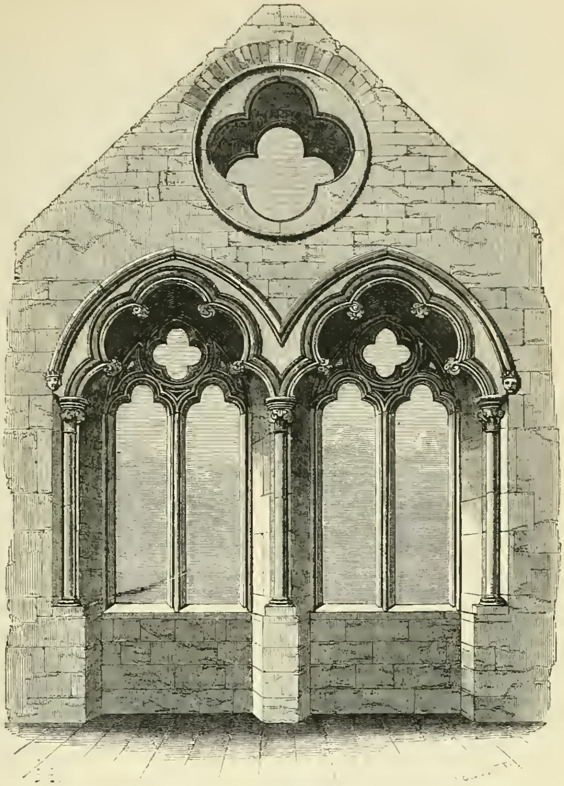
Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C

THE CATHEDRAL CHURCH AND OTHER ECCLESIASTICAL BUILDINGS OF WELLS.

NO group of buildings in this country possesses a greater interest to the students of what may be termed secular ecclesiastic history—as distinct from that of the monasteries—and its special architecture than the decayed and much be-patched cluster of houses, gables, and towers surrounding the cathedral church of Wells. The following notes may not be unacceptable to those members of the Architectural Association who are to visit the ancient city on Monday next, and to others not fortunate enough to bear them company. Although many of the residences of the clergy have been removed, some, to the shame of those concerned be it spoken, within the memory of the present generation, yet as a whole the series of cathedral adjuncts exhibit a perfection and completeness of their kind unique. This is due to several causes, the first geological, the abundance of excellent building stone in the immediate vicinity of the city having encouraged building of a durable character; further than this, Wells has always—or more strictly has for nearly a thousand years—been an establishment of secular canons, and hence was unaffected by Henry VIII.'s confiscations and rearrangements at the Dissolution; but a chief reason is that the city has no history. It never was fortified, has had no special manufacture or industry, and has owed what little vitality it has ever possessed entirely to the great "bishopstool" of St. Andrew, around whose close the townspeople's dwellings nestle.

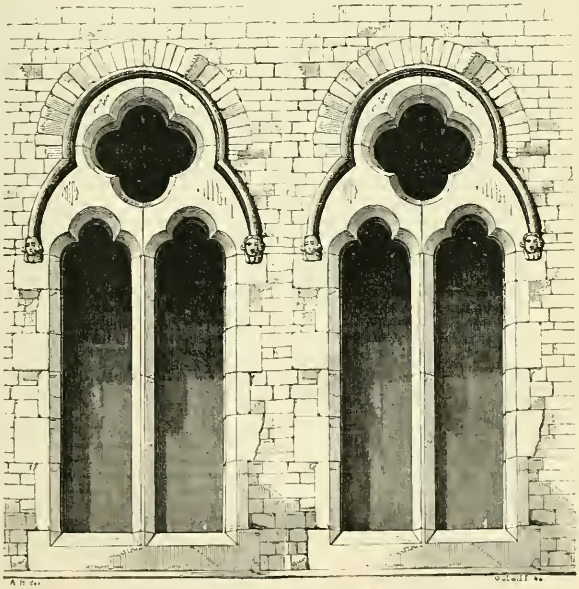
This appearance of isolation and picturesqueness has not been diminished by the formation of a line of railways through the city. No one entering Wells by rail from the southward can fail to be struck with the beauty of his first view of the sleepy little city. Emerging from the cutting through stone-beds, one looks down a valley to the right upon the long lead roofs of the cathedral, broken by the lines of the transepts and crowned by the symmetrical central and twin western towers; to the massing of the leads variety is given by the steep pitch of the chapter-house jutting up from behind the choir roof and the lower hipped roof of the eastern Lady chapel. To the right are the Bishop's palace and the turrets and ruined walls of the banqueting-hall, still moated all round and fortified with gateways, towers, and porter's lodge; in front are more gateways, and to the left lines and blocks of quaint buildings, all of dark and grey stone, and most of them separated from the citizens' houses by the Close wall.

On entering the town the much-altered cross, now furnished with cups and taps, and used as a conduit-house and fountain, attracts attention as we pass on through the northern of the two Close gates, and look up at the unrivalled west front of the cathedral, with its tiers of crumbling statues, set in rich although roughly executed panelling, over the whole façade, and turned over the angles of the flanking towers. Of the three hundred figures not one can be with certainty identified, although there can scarcely be a doubt that the Te Deum of Ambrose was intended to be represented. The lowest tier is almost vacant, but shows traces of full-length statues beneath canopies; above are quatrefoils filled, according to the late Prof. Cockerell, with angelic figures; over these a series of Biblical subjects; then come two tiers of full-length statues, and a sixth tier is occupied by small figures representing the Final Resurrection. In the central gable are the angels, the 12 Apostles, and the feet of what must have been our Saviour in majesty. A scheme has long been in contemplation for filling up the vacant niches, and to this little objection can be raised if the sculpture is of equal merit to that of the late E. L. Redfern, at Salisbury. A singular effect is given to the front by the slender shafts of Purbeck, now bleached to a slate colour, which are brought forward on the buttresses between the niches. The unprecedented width of the west façade is due to the fact that the towers stand beyond the aisles. The southern steeple is proved by the documentary evidence to be about half a century later than the other, but the style has been so well followed that it is not easy to trace the changes introduced in the details. Further examination of these western towers confirms the impression that though admirably proportioned so as to harmonise with the west front, with the general mass of the cathedral, and with the



THE BISHOP'S PALACE, WELLS.

(Interior of Window at North end of Bishop Jocelyne's Hall, now the Bishop's Dining Room.)



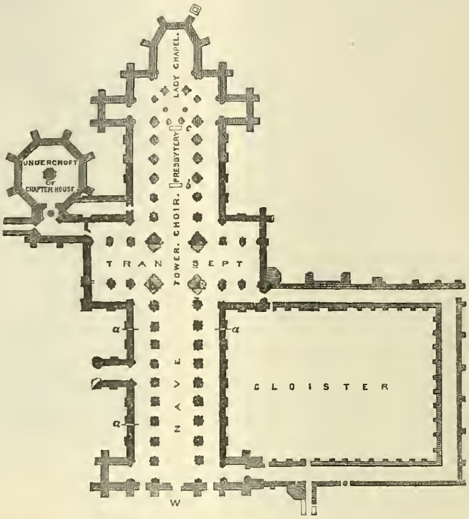
THE BISHOP'S PALACE, WELLS.

(Exterior of South Window at Bishop Jocelyne's Hall.)

central tower, they end too abruptly. There is no sign that any addition to the masonry was ever intended, and Mr. Freeman's suggestion, that it was proposed to cap them with pinnacles and spires of wood covered with lead, appears to be justified by the facts, and by other examples.

Passing round to the north side for a general survey of the exterior, the archaic north porch in centre of nave side, and the charming covered bridge or "chain-gate"* thrown across the road from the chapter-house and north transept to the Vicar's Close, deserve attention. Around the whole cathedral runs a simply-treated 14th century parapet, binding the whole into one composition. The octagonal chapter-house, with rich traceried lights, separated by pinnacled buttresses and open parapet, and its singular staircase, is of a beauty only surpassed in its kind by the groined interior of this adjunct, with fan-like vaulting springing from central pillar. Scott's restoration at Westminster, although evidently reconstructed on this model to an enlarged scale, appears scarcely equal to it in beauty. The alteration to Decorated style of the three eastern bays of the choir from the earlier work of the three western ones is very marked in the fenestration, walling, and roofing. The Lady-chapel is a low, irregular pentagon, joined to the choir by a short corridor, and from this point the richly-ornamented central tower is seen to rise with grace from the roof. A walk into the extensive cloisters on the south side of nave completes the circuit of the cathedral. They are but of three sides, and are filled with memorial tablets, chiefly modern.

But before entering the Cathedral, some reference should be made to the historical sequence of its development. From the plan, which we reproduce by the courtesy of Messrs. Macmillan, the publishers, from Mr. E. A. Freeman's graphically written "History of the Cathedral Church of Wells,"† its compact and symmetrical arrangement, and the approximate dates of erection, can be seen. It consists of a nave of ten bays with aisles, the north and south transepts, each having north and south aisles, and of three bays each, an aisled choir of three bays, and beyond the retrochoir, and separately roofed, a Lady chapel. From the north transept a corridor leads to the octagonal chapter-house, and the whole south side of nave is flanked by the cloisters. The original Saxon church seems to have been rebuilt, or more probably greatly repaired, by Bishop Robert between 1135 and 1166. Less than forty years after, however, Bishop Jocelyne determined to re-cast the whole on a larger scale, and accordingly pulled it down, and commenced to re-erect it piecemeal, beginning, it is clear from the coursing of the masonry, at both the east and west ends, and the slight changes in design, that the gap of the fourth and fifth piers from the west end was bridged over last of all. At the same time, the three first bays of the choir and the transepts and the original cloister, then partly of wood, were in steady progress throughout the long episcopate of Jocelyne. Whether the west front is earlier or later than the nave has been much disputed; that it is different in style and more like the work of Central England than the provincial workmanship of the nave can be seen at a glance; Prof. Willis and the late Richard J. King regarded it as a subsequent addition, but Messrs. J. H. Parker and E. A. Freeman believe it to be prior in date. Fifty-four years after Jocelyne's death, the "tholus," either the vault or central spire, fell in and did much damage. In 1286 the chapter appear to have completed their house, of which but the croft had been commenced. In 1321 the central tower was raised to its present height by Bishop Drokensford, and a few years later the Lady chapel was completed, the choir being soon afterwards extended three bays eastwards so as to meet it. The old choir was somewhat awkwardly adapted by re-casing to the new work. As a church St. Andrew's was now complete, but the western towers were, as Mr. Freeman says, "mere stumps." The central tower had just been raised (in 1318-21) by three stages, and a "campanile" (? wooden spire) added, but signs of failure showed themselves in the piers, and to save it, the device was adopted which gives a unique effect to the internal view of Wells cathedral. A low arch was turned across the nave, and another in each transept. Upon each of these an inverted arch was set, forming with the vaulting a gigantic pierced circle through which the roofs may be seen, and also the segmental openings of the spandrels were also left open. The adjoining arches of the clerestory and triforium were also blocked up. The eastern opening is closed by a stone screen. These works were completed in 1337-8. The last structural work was the raising of the towers. That in the south was the work of Bishop Harewood between 1366 and 1386, the other seems to have been carefully copied from it by the executors of Bishop Babwith in 1425, who also rebuilt the eastern cloister walk. The west and south sides were the work of Bishop Beckington in the middle of the 15th century.



GROUND-PLAN OF WELLS CATHEDRAL.

The internal effect of the cathedral is very fine; but the edifice appears narrow and low in proportion to its length. The nave is of rich but somewhat rude Early English character; the octagonal clustered piers have stiff foliage and birds in the caps. The whole emphasis of the effect is horizontal. The long line of the nave is well broken up by the Perpendicular music gallery in the central bay and the shallow open-work chantries between the second and third piers from the east end. During Mr. B. Ferrey's restoration of forty years ago the piers were cleaned from whitewash, and a somewhat wiry scroll pattern was stencilled in each of the lierne vaults. In the north transept is a singular astronomical clock of the 14th century (the works are modern) and on the north wall at right angles to this is a small wooden figure which strikes a bell. The choir is of great richness and beauty, its numerous arches of various sizes, the gilded groining, the stained windows with their elegant Decorated tracery, the tabernacle work, and the lines of the Lady chapel seen through a low screen uniting to produce a beautiful effect. The polychromatic decoration of the vault, executed by Salvin, is harmonious. In the choir aisle and north-east transept are several effigies.

The adjacent buildings scarcely yield in architectural merit and value to the cathedral. The Bishop's Palace (in which the Architectural Association are invited by Lord A. Hervey to lunch on Monday), though a part of the grand group of buildings, is, practically, detached by its moat, and so forms a complete structure in itself. It was originally erected by the rebuilder of the cathedral, Bishop Jocelyne, and was of the usual quadrangular form, the east side consisting of the Bishop's residence, still in use; the south, of the chapel, rebuilt by Bishop Burnell some half-century later; and the north, of the kitchen and offices, which have been frequently altered and rebuilt. Whether the fourth side was filled in, after the usual fashion, by a gate-house, since destroyed, or whether the foundations merely of this structure were marked out and put in, is a matter of doubt. The whole area of buildings and gardens is surrounded by a moat, supplied from the "wells" of St. Andrew, to which the city owes its name, and very probably its existence. To these buildings Bishop Burnell, when rebuilding the chapel, added, adjoining its south-west angle, a banqueting-hall. About 1360, Bishop Ralph, of Shrewsbury, built the fortifications and gate-house, and enlarged the moat. The interest of the building centres in the portion built by Jocelyne, probably one of the oldest buildings in England which has been continuously occupied. It consists of a rectangular building, roofed in two parts, that on the east, looking on the garden; being of the original height of two stories, while to the quadrangle or west face a third story has been added. At the outer north angle is a wing built on a projecting tower. The lower story is divided by a septum into entrance hall on quadrangle front and servants' hall beyond. These are covered in by quadripartite vaulting, with slender ribs and corbels, the latter having annular mouldings of the best Early English type. The servants' hall, the western and wider portion, has a central range of columns of similar character carrying the vault. The windows on the east are plain splayed lancets, and these on the west are two-light trefoil-headed, and these Mr. Parker conjectures have been altered. This western portion of the ground floor is now used as the bishop's cellars. The upper story of the building is also divided by a solid wall, which separates one-third of the width as a long gallery, originally two rooms. The larger division seems always to have found three rooms. The side windows are of two lights, having cusped trefoiled heads with a cusped quartrefoil opening above. Each has an internal trefoil arch, with rich mouldings, and having blue marble foliage shafts in the jambs. By permission of Messrs. Parker, we reproduce illustrations (from Parker's "Architecture of the City of Wells," to which we are partially indebted for this description), of the end windows of the western portion of this floor. Each is of four lights divided into pairs, each with a quatrefoil in the head, and in the gable over the centre of the subdivisions is a larger quatrefoil, originally open to the hall, but concealed by the modern ceiling. The south window, of which an exterior view is given, is very beautiful, but rather plainer than that at the north end, the cusps not being carved with foliage. In the wing at the north end of the building are oriel windows added by Bishop Clerk, between 1523 and 1540. The exterior appearance of the palace was greatly altered by the alterations effected by Mr. Benjamin Ferrey, F.S.A., forty years since, when the western third story was added; a series of buttresses with heavy stepped slopes was thrown out between the bays on each side, and a semi-octagonal staircase formed in the angle of the wing and main edifice. The chapel is a beautiful little groined structure of four bays, and, together with the great hall, of which only a few walls remain, is Bishop Burnell's work, of the closing years of the thirteenth century. These are of distinctly later character, with greater freedom in the mouldings and more elaboration of cusping. The palace is approached by a massive castellated gatehouse, probably erected by Bishop Ralph, of Shrewsbury, in the fourteenth century.

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* A drawing of this, as restored, appeared as the last issue of the "Sketchbook Series" in the Building News eight years ago.

† It is scarcely necessary to commend this book to architects or architectural students, but any intending visitor to Wells, who may not already be familiar with it, should not neglect to procure it.

We have not space to notice in detail the other buildings of this unique group. One of the largest is the Deanery, on the other side of the Cathedral green, rebuilt by Dean Gunthorpe, at the close of the 15th century, in which, as at the palace, the principal apartments are on the first floor, the dining-room being on the north front of the house. The house, although much modernised, is an excellent example of the transition from the Mediæval to the Modern mansion. A part of the Archdeanery, which is close by, dates from the period of Edward I., and is remarkable for a small window in the east gable containing wooden tracery of this period. The fine hall has an open-timber roof of the early part of the 15th Century. Adjoining the south-west angle of the cathedral are remains of the *domus informator puerorum*, commonly called the organist's house, a plain T-shaped structure much mutilated by lath-and-plaster alterations, and partly demolished about ten years since. Near this, on the west wall of the cloister, is the Singing or Grammar school: the original doorways of communication remain, but have been blocked up. At the east end of the cathedral is the Precentor's house with beautiful square-headed doorway, and three-light windows above, both of fully developed Perpendicular character.

The Vicar's Close is a most picturesque feature of the cathedral buildings. It is a long narrow court, approached from the cathedral by the Chain Bridge already described, and has at the south end and next the cathedral an entrance gate with common hall above, and at the north end a chapel and library; the sides of the court being formed by a series of dwellings for the forty vicars choral, with projecting chimneys, low doorways, and small windows. The court was originally built in the 14th century, and although the tenants have much modernised the houses it retains much of the character of its primary design. In the Liberty outside the close-walls are several of the Canon's houses; one of these to the north of the cathedral has a small plain square tower at the north end, without buttresses, but with a piquant eight-sided turret, projected on corbelling on the north side. This is still known as the house of the Master of the Fabric.

Numerous as the domestic buildings still are, they have been for the past three centuries steadily decreasing in number, and the process, which we have seen dates from the earliest time, has been continued, of remodelling them to suit present requirements; even within the last few years several of the buildings have been pulled down by those whose duty it was to have preserved them. The only hope of preserving these most interesting edifices lies in the education of the lay public, as well as the members of the chapter, in the value of these buildings as illustrating the manners and customs of the secular clergy, and the domestic architecture of the middle ages.

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THE DECORATION OF THE CUPOLA OF ST. PAUL'S.

SINCE the publication of our last remarks upon this subject we have had an opportunity of inspecting the coloured drawing prepared by Mr. R. Popplewell Pullan and Mr. Charles Heath Wilson, for the decoration of the cupola of St. Paul's Cathedral. Although from the photograph we first saw, our opinion of the scheme was favourable, we had not the actual colouring before us, and we can now, therefore, with greater confidence, speak of the design in its completeness, as regards composition and colour. The drawing we inspected at the Egyptian Hall represents one compartment of the dome to a scale of one-sixth full size, and was necessarily hung as a picture, rather above the eye, in a room lighted in a manner very different from the real lighting to which the surface of the cupola is actually exposed. Under such conditions of course it would be unfair to criticise the painting we saw; it would certainly be unjust to judge of the effect of a painted scheme intended for a cupola at least 200ft. above the spectator's eye illuminated chiefly from the lantern above it; and we therefore think the scheme has not at present a fair trial. The colouring of the drawing of course looks brighter and harsher than it would appear at a misty height softened by distance and broken by shadows and half-lights from various points; and we therefore desire to call attention to what appears to us to be the real difficulty to be overcome in judging of the real effect of cupola decoration prepared on flat surfaces and placed near the eye. Messrs. Pullan and Wilson's scheme has unfortunately these obstacles to encounter, and we are sorry they have not waited a little longer till they were able to erect a small model to the same scale for the exhibition of their very excellent design. A critical judge of colour on lofty surfaces can, however, estimate with considerable accuracy the effect of the scheme, and our inspection has confirmed the opinion we recently expressed. A small and sketchily-prepared drawing of the design by Mr. Pullan gives even a fairer representation of the scheme than the larger drawing, inasmuch as the colours are presented pictorially, and as they would appear to the eye broken by distance. In the large-scale drawing this subdued effect is less apparent, for we have the colours brought rather vividly and disproportionately before us. We have already described the general scheme of the design. The subject selected is the Court of Heaven, as described in the *Te Deum*. Beginning at the centre of the lantern, we find a figure of the Agnus Dei upon a gold ground, with blue cherubim and red seraphim in the circles and spandrels between the arcade connecting the capitals of the ribs. The large spaces between the ribs are painted azure, deepening in tone as it descends, and upon this ground are the crowds of adoring angels illustrating the line.

"To Thee all Angels cry aloud."

In the corridor or colonnade the Apostles are seated under canopies, in allusion to the passage—

"The glorious company of Apostles praise Thee,"

the darker tints of which composition happily connect the ribs and tend to consolidate the design in its lower portion. The ribs themselves become darker as they descend, the faces being enriched by painted bas-reliefs in rich brown relieved by gold. At the foot of each rib is a throne with a seated figure of a prophet, and by the side of the Apostles, and ranged also beneath them, are the martyrs mentioned in the Calendar of the English Church.

"The noble army of Martyrs praise Thee."

Those round the base of dome are placed against a light stone-coloured podium. Figures representative of the "Holy Church throughout all the World" are intended to be placed in the drum of the dome, below the windows, and will form a grand procession in all periods and costumes.

Such is a brief outline of the scheme and its gradation of figure subjects, rising thus from the Holy Church throughout the world round the base to the celestial hierarchy in the vault above. In the colouring the authors have observed a gradation in the successive zones, the lower figures standing against the podium are dark and rich in the tints; in the colonnade above the colours are brighter, though still made to contrast with the deep azure between the columns, while the ranks of angels above are much lighter and more radiant in tint, and as they ascend to the lantern will appear from below to mingle into one another and form a broken crowd of figures illumined and cloud-like in effect. The dark ribs also contrast with the irradiated azure spaces representing the abodes of "light eternal," and lead the eye insensibly to the darker masses of the figures round the base. We observe also the artists have obtained their contrasts entirely by shades of colour, lightened by the use of white. The drawing, as we have observed, scarcely gives us the effect of the modifications due to air and distance, but there is a pleasing balance of colour in the composition. The authors suggest that their design could be executed in fresco, tempera, or mosaic; if in the latter, a gold ground is proposed in preference to the azure between the ribs. In this case the ribs, with the figures and ornaments upon them, might be executed in stucco in low relief. By these means great richness of effect would be obtained, and the constructional idea of the design fully realised.

We consider Messrs. Pullan and Wilson's scheme, for its unity and simplicity of character, and for its admirable agreement with the architectural lines of the edifice, following the design of Sir James Thornhill in its leading conception, should have at least a fair trial. The decoration of the dome of St. Paul's is a national work in which all artists feel a just interest, and it would be perfectly absurd for the Dean and Chapter to ignore all outside suggestions at this juncture. Messrs. Pullan and Wilson do not wish to interfere with the artists already selected; they only desire, we understand, a fair hearing and judgment upon their work, and are prepared, we believe, to execute a large cartoon for one of the compartments at the bare cost out of pocket, so that the public may pass an impartial opinion upon it, as they fully believe their design offers a wider scope for the exercise of the talents of the eminent artists selected by the committee than the limited spaces for figures in the design by the late Mr. Stevens.

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PLUMBER, PAINTER, AND GLAZIER.

IT is not easy (says the author of a volume entitled "The Plumber, Painter, &c.," published by Messrs. Houlston and Sons) to determine why such very different substances as *lead*, *glass*, and *paint*, should form the materials on which one workman is engaged, nor why one master tradesman should undertake to supply those materials for the building or repairing of a house. Yet such is the fact:—If a severe frost burst our water-pipes, or if a hail-storm, or any other circumstance, break the glass of our windows, or if the woodwork of our rooms require a coat of paint, either for the purpose of preservation, or for the sake of cleanliness or ornament, we send to the same tradesman in all of these instances, viz,, the plumber, painter, and glazier. Nay, more:—If a shopkeeper wanted his name and trade to be written over his shop window, he applied (until within a few years past), in almost every case, to the plumber, painter, and glazier; if such be not so much the case at present as in previous years, the change is due to the circumstance that *raised* letters, made of wood or of metal, have to a great extent superseded the use of the painted letters formerly employed. Another reason is that "writing," as the painting of names, &c., on facias over shop-fronts, and on boards and surfaces of any kind is called, and the imitations of various woods, stones, &c., are confined to a great extent to certain persons who do nothing else, and who work for and are paid by the trade for the most part, and receive a higher rate of wages than the ordinary house painter.

In churches and old houses, much of the material of windows is made of lead; and it is probable that this circumstance led to the connection of plumbing, or lead work, with glazing. Why *painting* should be connected either with plumbing or with glazing, is not so easy to conjecture; for with the exception of the putty which the glazier employs as a sort of cement for securing his squares of glass in a window frame, and which contains linseed oil as one of its ingredients, there is scarcely the smallest resemblance between the tools or the materials of the painter and those of the plumber or the glazier. The only rational explanation seems to be, that when a casement or lattice was made and glazed, the lead work received a coat of paint, and that convenience suggested that this should be done by the glazier. This might have been all well enough when glass windows were a rarity, and consequently a luxury. Whether it is desirable in the present altered state of domestic buildings, that such should be the case—that trades should be mixed up together which have so little relation to one another—is now too late to inquire; whatever circumstances may have originated the connection, it has now grown up into a habit, or recognised arrrangement, and as such we must treat of it.

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It is stated that it is the intention of Mr. T. S. Bolitho to rebuild Trengwainton, near Penzance, on plans prepared by Mr. J. Piers St. Aubyn, at a probable cost of about £15,000.

OUR COMMONPLACE COLUMN.

HOTHOUSE.

Horticultural buildings of this class include greenhouses, conservatories, orangeries, &c., and the chief features about them are glass sides and roofs, with means for regulating the heat and ventilation. The roof sashes may be made to slide in grooves or to open on hinges; in both cases care is necessary to prevent the ingress of wet by properly shaped bars, checks, and grooves. Besides the upper ventilation, it is requisite to open the side-lights, or some portions of them. The lights are frequently operated upon by a series of levers fixed to a rod which traverses the house, and can be actuated by a crank or handle at one end. For examples consult Loudon's and Sir Joseph Paxton's works; also recent articles in the Building News. Hothouses may be glazed with 16oz. sheet-glass, or on Rendle's system, and may be warmed by stoves or hot-pipes. The roofs may be lean-to, span, or curvilinear in form, tied by iron rods. They are sometimes constructed in a portable form, so as to come within the designation of tenants' fixtures.

HOTEL DIEU.

In French, *maison dieu*, the name for a hospital in mediæval times. In England there are few remains of these buildings. There is a good example at Dover. See the works of Parker, Viollet-le-Duc, Verdier, and the article Hospital, ante.

HYPÆTHROS.

From two Greek words, meaning "under" and "the air." A temple open to the air or uncovered. Vitruvius describes a hypæthral temple as being "sine tecto et sub divo," but observes that the arrangement was rare. Mr. Fergusson's theory is that the inner columns supported a kind of clerestory, or a sort of "counter sinking" on each side of the roof, but the idea does not meet Vitruvius's description. The reader is referred to a paper read at the Institute of British Architects by Mr. Fergusson, in Jan., 1877 (see Building News for Jan. 26 and Feb. 2, 1877) and to Fergusson's "Handbook of Architecture." We may remark that recent writers throw but little light upon the subject, and that the writer of the article on Greek architecture in the last edition of the "Encyclopædia Britannica" merely mentions the theories noticed above without discussing the matter. Bœtticher first suggested the clerestory theory. According to Vitruvius, this class of temples had ten columns on each front, and was surrounded by a double portico. The cell was open, and surrounded by a portico of two ranges of columns.

HYPERBOLA.

A conic section, produced by a plane, whose directrix falls within the base of cone, or by a plane which makes a greater angle with the base than the opposite side of the cone makes. For the most useful properties of the hyperbola, we refer the reader to any treatise on the conic sections as Gregory's Practical Mathematics, Gwilt's Encyclopædia, or Tarn's Geometry. The hyperbola may be mechanically described by means of a ruler movable on a pin and a string, the operation being very simple; or it may be described geometrically from the diameter, the abscissa and the double ordinate; both methods are explained in works on practical geometry. We may confine our remarks here to the value of this section in architecture. It is well known that the Greek architects designed their finest mouldings with this curve, and that Greek profiles cannot be struck by arcs of circles as in the Roman mouldings. Thus the corona of the cornice and the echinus or cyma of the Grecian Doric in the best examples are hyperbolic in curvature and can be drawn by ordinates or by the hand only. The Greek Doric capital has been shown to be a perfect cyma-reversa with the end flected as it flows out of the shaft below and turns in under the abacus above. This is not so evident on looking at this member, owing to the annulets which divide the curve into an ovolo and a cavetto. But the property of this curve is otherwise valuable to the student of construction and architecture. In roofing, in which conical roofs are employed, the intersections are often hyperbolic. In the theory of the arch the hyperbola is considered the proper form for an arch of equilibrium that has to support the greatest load in the centre diminishing towards the piers. In many other problems this curve enters. One of its chief properties is that the difference of the distances of any point in the curve from the foci is always the same, and is equal to the transverse axis; also that the squares of any two ordinates to the transverse axes are to each other as the rectangles of their abscisses.

HOUSE.

Weale, in his "Dictionary of Terms in Architecture," &c., quotes Vitruvius on houses as follows:—"Nothing ought to engage the attention of an architect more than the proportions of all the parts in the houses he constructs. After having determined upon such proportions as the necessity for the commensuration of the parts with the entire building seems to require, the greatest judgment must be exercised in adapting them to the nature of the spot, the use to which the edifices are designed, and the appearance they ought to assume; and this must be done by making such additions or deductions, that although the proportions are not strictly what they ought to be, the eye may not be conscious wherein they fail. The same objects appear differently under dissimilar circumstances; if near the ground or at a considerable elevation, if in a confined space or an exposed situation. Under every peculiar circumstance great judgment is necessary in calculating the effect which will be ultimately produced. The impression made upon the sense of seeing is not always a correct image of the object, for in painting, columns, mutules, and statues are made to appear projecting and detached, when, in fact, every object represented is in one and the same plane. It becomes necessary, in the first place, to institute laws of proportion upon which all our calculations must be founded. According to these the ground-plan, exhibiting the length and breadth of the whole work, and the several parts of it, must be formed. When the magnitude of these is once determined, the parts must be arranged so as to produce that external beauty which suffers no doubt to arise in the minds of those who examine it as to the want of proportion in any part." For a detailed description of the Greek and Roman houses, see Dr. Smith's "Dictionary of Antiquities,—Domus," and Westropp's "Archæology," p. 17.—C. F. W.

HYPOSTYLE HALL.

This name is given to those halls in which the central row of columns on either side is higher than the others, and corresponding to the clerestory in Gothic architecture; by this means light is admitted into the hall. Mr. Fergusson, speaking of the hypostyle hall of Manepthah, says:—"No language can convey an idea of its beauty, and no artist has as yet been able to reproduce its form so as to convey to those who have not seen it an idea of its grandeur. The mass of its central piers, illumined by a flood of light from the clerestory and the smaller pillars of the wings gradually fading into obscurity are so arranged and lighted as to convey an idea of infinite space; at the same time, the beauty and massiveness of the forms, and the brilliancy of their coloured decorations, all combine to stamp this as the greatest of man's architectural works; but such a one as it would be impossible to reproduce, except in such a climate, and in that individual style in which and for which it was created." (Hdbk. of Archt. v. I. p. 232).

HYPOTRACHELIUM.

Hypotrachelium (from ὑπο and τράχηλος, the throat, neck) "the necking of a capital introduced between the capital itself and the shaft of the column. In the Grecian Doric, the hypotrachelium is little more than nominal, being marked only by one or more horizontal channels or incisions, and the flutings continued through them; whereas to the Modern Doric capital, a distinct necking is given by the astragal, which separates the capital from the shaft, and marks its commencement. But that is considered an essential part of the capital, and as to the Corinthian capital it does not admit of any necking; wherefore, the Ionic one possesses a great advantage over either of them, inasmuch as it may have a distinct necking or not, and it may be either plain or enriched." C. F. W.

HYPOCAUST.

This was a vaulted apartment, in which furnaces were made to distribute heat to the rooms above. Tubes or flues of earthenware were used for this purpose. The hypocaust was chiefly used to heat the ancient baths, though it was applied for warming generally. Many of our modern systems of heating, which places coils of hot-water piping or furnaces in the basement, is based upon a similar principle.

HYPOCAUSTUM.

"The hypocaustum" (from ὑπο-καίω I set on fire from below) says Westopp, "was a description of flue built under the floor (suspensura) of the bath, fires being lit at the entrance, and the hot air thus generated being driven under the floor. It was of course hollow, the floor of the bath being supported on pillars ranged at regular distances, and usually standing from 2ft. to 3ft. high." Fairholt remarks that "it was till lately a constant mistake made by topographical and antiquarian writers to term all such rooms 'Roman baths.'" C. F. W.

ICE-HOUSE.

The best form for an ice-house is said to be that of the frustum of an inverted cone 8ft. to 20ft. diameter, and 10ft. to 20ft. deep, bricked round with hollow walls. The ice is placed on a raised grated platform or floor, so that the water may be readily carried off. The entrance is sometimes at the top or near the top, double doors well covered with straw being used. One of the most important requirements is thorough drainage of all water from the floor, and for this purpose ice-houses are best built upon sloping ground. Every means should be adopted to prevent all communication between the inner and outer air. Dampness is very prejudicial; hence the advantage of a dry situation.—C. F. W.

INFIRMARY.

Infirmaries are used either for aged and helpless people, in which sense the building partakes of the nature of an alms-house; or are intended for the reception of sick or diseased patients, as those built for workhouses. We confine our remarks here to the latter sort of infirmary. For infectious cases the infirmary is best placed in a retired position, and isolated from the workhouse proper, or only connected with it by a corridor. In such wards the floor-space should allow at least 80ft. superficial to each patient, or 960ft. cubic space of air, the washhouse should be detached, or a disinfecting closet provided. The dormitory wards are recommended by the Local Government Board to have the following minimum wall space for each bed, exclusive of doors and fireplaces, viz., for inmates in health, for adults, 4ft; women and infants, 5ft.; children, $3\frac{3}{4}$ft. for single, and 5ft. for double beds; for sick, itch, and venereal cases, 6ft.; for lying-in, fever, and small-pox cases, 8ft. The day-rooms should afford accommodation for not less than half those who occupy the day and night rooms—a minimum of 20ft. floor-space being allowed. It is also recommended that sick-wards should be 20ft. wide, 10ft. or 12ft. in height, infectious wards being of the latter height. Cross ventilation by windows on opposite sides is desirable. The width of 20ft. allows a centre gangway between beds. For single rows of beds 12ft. is the least width. Nurses' rooms, kitchens, and sculleries should be conveniently attached at the ends or sides. Wards are best placed in parallel blocks connected by a corridor in large establishments. Ventilating fireplaces are desirable, and air-bricks, 9in. by 3in. or 6in. high, with perforated gratings on the "hit and miss" principle, may be placed at intervals round the walls. Special means of ventilation by flues are desirable, and the walls should be plastered internally with no projections or crevices for dirt or dust. The pavilion principle is generally adopted in the planning of infirmaries, a long corridor giving access to a series of parallel wards sometimes alternating. Each ward may be made to hold 8 to 10 beds, and have its own bath-rooms, &c. In the centre are arranged the official and administrative apartments. The Local Government Board requirements demand a separate building from the workhouse, and the sick are divided into—1. Ordinary sick of both sexes; 2. Lying-in women, with a separate labour-room adjoining the ward; 3. Itch cases of both sexes; 4. Dirty and offensive cases of both sexes; 5. Venereal cases of both sexes; 6. Children of both sexes; and 7. Fever and small-pox cases of both sexes. Classes 1 to 6 may be accommodated in the infirmary. For itch and venereal cases separate entrances should be made, and for class 7 a separate building. For examples of infirmaries we refer the reader to the Building News of various dates. In their design, which should be simple and appropriate, especial care should be taken to place the axes of the wards in such a position as to insure ample sun and air; the conveniences are best arranged as projections at the ends or at the corners; the windows should be high, close to the ceiling, and have pivoted casements at the top so as to regulate the ventilation.

IMPLUVIUM

Is the uncovered part of the Greek or Roman house, and was surrounded by the apartments. An awning was stretched over it. In another sense it is applied to the sinking in the floor to receive the rain-water.

THE SUNDAY SOCIETY.

On Sunday last the Grosvenor Gallery was opened to the public, under the auspices of the Sunday Society, when no fewer than 3,000 visitors took advantage of the opportunity thus afforded them of inspecting the art collection which has been on view at the Gallery during the present season. The Society was represented on Sunday by several of the officers, who rendered service as honorary stewards, and many of the pictures on the walls are the work of artists who, recognising the necessity, both socially and politically, for opening on Sunday the museums and art galleries belonging to the nation, have not hesitated to identify themselves with the movement, as members and office-bearers of the Sunday Society. Among others who have taken this position we may mention Sir Fredk. Leighton, President of the Royal Academy, and Mr. Alma Tadema, Mr. J. E. Millais, and Mr. G. F. Watts, all Royal Academicians. The success which attended the Sunday Art Exhibitions initiated by the Sunday Society last year has encouraged the committee to continue this practical work, and a Temporary Loan Exhibition is now being arranged for at the East End of London. It is desired to open this Exhibition during the Autumn, or early in the Winter, and artists and others are asked to assist the committee by lending works of art for the three or four weeks during which the exhibition will be open. All communications on the subject should be addressed to Mr. Mark H. Judge, the honorary secretary, 19, Charing Cross, S.W. The practical work of the Sunday Society is bearing fruit, and this year the Exhibition of Paintings at the Royal Albert Hall, which is under the patronage of Her Majesty the Queen, has been opened on Sundays.

BOOKS RECEIVED.

Bevis's Builder's Price-Book has been revised to date, and a Midsummer Edition issued by its author—not a bad idea, though, after all, the slackness of things in the third quarter of the year renders comparatively few references to such handbooks necessary.——*Sleep and Sleeplessness*, by J. Mortimer Granville (London: David Bogue), is another handy little shilling manual, following others of a similar kind we have previously noticed. Dr. Granville has always something to say, and, of course, says it well, and those who court in vain "tired nature's sweet restorer" may well consult his pages.——*The Plumber, Painter, and Glazier* (London: Houlston and Sons) forms No. 29 of the "Industrial Library," issued by the publishers. It can hardly be said to contain much technical information of value to members of the trades which are enumerated in its title, but there is a good deal of information likely to be useful to the outside public. We have elsewhere reproduced a portion of the introductory chapter.——*Paterson's Electric Catalogue* (E. Paterson) is issued by a practical electrician, who is, we know, well qualified to fix or supply any of the apparatus described therein.——*Brief*, Vol. III. (London: Wyman and Son), is certainly the journal to keep in a bound form for those who wish to preserve a record of passing events and yet cannot spare space on their modest bookshelves for the accumulated volumes of the daily and weekly journals which *Brief* abstracts so well for the benefit of its readers.

COMPETITIONS.

Newark Hospital and Dispensary Competition.—Instructions to intending competitors for the erection of the above building were issued on the 18th ult. An intending competitor writes us that on receipt of the same he wrote to the secretary pointing out several errors in the instructions, and stating that he had reason to believe that an architect residing in a town not far distant from Newark had three years before prepared a plan for the proposed hospital, which had been put before the committee by one of its members, who was a relative of the architect in question. Our correspondent received a reply from the secretary, which he considers so unsatisfactory that he does not intend to compete, believing the result to be a foregone conclusion. We trust his apprehensions are unfounded, and that the award of the committee will be made solely with a view to the selection of the best design.

Building Intelligence.

Chorley.—On Saturday last, the new Town Hall, at Chorley, Lancashire, was opened by Col. the Hon. F. A. Stanley, M.P., Secretary of State for War. The building is entirely of stone, with boasted face, Yorkshire parpoints, and dressings of rubbed Longridge tone. In the basement is a large butter market and cellarage, &c. On the ground floor are the commissioners' board room, 30ft. by 32ft., offices for town clerk, borough surveyor, gas, water, and rate collectors, treasurer and accountant, post offices, and various other offices let to professional gentlemen. Approached by a grand staircase, the large hall or assembly room is reached, on the first floor, and is 100ft. long by 58ft. wide, and 36ft. high, lighted on both sides, having an orchestra and retiring room at one end, and a refreshment room, cloak rooms, &c., at the other. Five exits are provided in case of necessity, three being ordinarily in use. The remainder of this floor and the floor above contain offices for letting. The cost of the building, exclusive of the land and furnishing, but inclusive of a clock and chimes supplied by Messrs. Gillett and Bland, at a cost of about £800, amounts to about £24,000. The contractors for the stonework and slating were Messrs. Gabbutt and Sons, of Liverpool; for the carpenter and joiners' work, Messrs. Gillett and Son; plasterers, Messrs. Whalley and Son; plumbing and painting, &c., Mr. T. Lucas, all of Chorley. The architects were Messrs. Ladds and Powell, of London, and the clerk of the works, Mr. Henry Winfield, of Ewelm, near Wallingford. The acoustic properties of the large hall are pronounced good, and the whole of the work has given great satisfaction to the Commissioners and the town.

Exeter.—On Tuesday the foundation-stone of the new Grammar School at Exeter was laid. The plans have been prepared by Mr. W. Butterfield, of London, and the contractors for erecting the buildings are Messrs. Stephens and Bastow, of Bristol, whose contract is £13,000; the work is being superintended by Mr. J. H. Newton, with Mr. Hampton as foreman. The ground plan is in the shape of the letter L. The assistant master's house is at the angle, and the wings jutting out from this angle run the one to the north and the other to the east. When funds permit a south wing will be added, and then a head-master's house and a chapel will be constructed. The style of the building is described as Domestic Gothic of the 14th century. The building will be of red brick from Culm Davey, and the architectural features will be of Box Ground stone. The roof will be covered with green slate from Whitland Abbey. The present buildings will provide for about 60 boarders.

Metropolitan Board of Works.—At the meeting of this board on Friday, it was decided to grant an application from Paddington Vestry, for permission to borrow £3,200 to purchase a piece of freehold land at Alperton on the banks of the Grand Junction Canal, for the purpose of depositing thereon ashes, breeze, &c., and also granted an application of Marylebone Vestry for permission to borrow £10,000 towards the cost of sewerage works. £1,500 was advanced to the guardians of Islington to complete alterations and additions at the workhouse school in Hornsey-road. A full report was received from the Works Committee upon the question of obtaining legislation with a view to providing a remedy for floodings from rainfall, recommending —(*a*) That the engineer having reported that a large amount of relief can be provided for floodings from rainfall by the carrying out of certain extension works, at a cost of £750,000, application be made to Parliament to include in the Board's Money Bill for 1880 power to borrow that amount for the construction of the extension works referred to. (*b*) That there being at present available for main drainage purposes an unexpended balance of about £150,000, a line of sewer be forthwith constructed from Wandsworth to Vauxhall, and that the engineer be instructed to prepare the plans and specifications for the execution of the work. (*c*) That the Board do modify the conditions upon which they have approved the construction of a proposed sewer from the Broadway, Deptford, to Lee Bridge, and that the Board do construct the sewer upon an assurance being given by the Lewisham and Plumstead District Board that they will adopt all the means in their power to prevent the surface water from entering such sewer. The engineer to the Board, Sir J. W. Bazalgette, explained that under the proposed works no more sewage or flood water will pass into the Thames than at present. Now, however, the water is held back till low tide, the consequence being that the basements in the low lying districts are flooded if heavy rains coincide with high tide. Under the new sewering arrangements, the waters will be discharged at all states of the tide, and thus, it is hoped, these disastrous floods will be prevented. Mr. Richardson said he should not oppose the proposal on account of the injury caused by the floods, although he feared it was but the first instalment of a new and expensive system of sewerage, and after considerable discussion, the report was agreed to *nem. con.*

Oundle.—Jesus Church, Oundle, was consecrated on Tuesday week. The building is cruciform in shape, the eastern and western arms being rectangular to the north and south. There are three columns in the church, carrying arches, from which spring the central angle, growing from a square into an octagon, finishing with a domical ceiling at a height of 50ft. from the floor. These columns are of Hollington stone. The church is lighted by a range of 16 clerestory windows. The style adopted is First Pointed. The church is built, for the most part, of the stone from the buildings which formerly stood on the site, with dressings of Casterton. The roofs, excepting that of the lantern, are all open timbered. Externally, the roof is covered with stone slates. Internally, what little stone has been used, excepting the columns already mentioned, is of Corsham Down. The arches and walls are of brick plastered. A certain amount of coloured decoration in distemper has been employed in carrying out what are believed to have been the founder's wishes. The floors, excepting that of the chancel, which is tiled, are laid with wooden blocks. The church is seated with chairs. The architect was Mr. A. W. Blomfield, of London; and the builder Mr. H. Clipsham, of Norwell, near Newark. The colouring and decoration were done by Messrs. Campbell and Smith, of 85, Southampton-row, London, who also executed the simple outline glass of the east window.

Pembroke, Co. Dublin.—The new Town Hall for the Pembroke Township, now in course of erection, is situated on the Rock-road, adjoining Ball's-bridge, on the outskirts of the City of Dublin. It is built of rough-punched Ballynocken granite set in regular courses, with bands of red sandstone. The principal entrance door and windows of upper story have columns of polished Aberdeen granite. The building provides accommodation on the ground floor for secretary, engineer, rate collector, post and telegraph office, also sanitary office and caretaker's apartments. The board room, 45ft. by 21ft., with open timber roof stained and varnished, is on the first floor. Off same, are waiting and cloak rooms, with lavatories, w.c., &c. Messrs. Gahan and Sons, of Dublin, are the builders, and have taken the contract at £3,300, which does not include the stables and out-offices, nor gas-fitting or wrought-iron safes. Mr. E. H. Carson, of Harcourt-street, Dublin, is the architect.

Portobello.—The foundation-stone of a new U.P. church was laid last week here. The new church, which has been designed by Messrs. Stewart and Menzies, Edinburgh, takes the form of a truncated or tau cross, 61ft. long, and 66ft. wide at the transepts. At the pulpit end there projects outwards an arched large recess, with an ornamental circular window. The ground behind the church is occupied by a hall, capable of seating about 200, vestry, and other conveniences. The gable of the church facing High-street is flanked on one side by a tower, with angle buttresses and spire rising to the height of upwards of 130ft., at the corner of Windsor-place and High-street; while on the other side cloak-rooms are provided. The style adopted is Gothic of the Early Decorated period. Internally, the church is at present seated for 760 in area and gallery, but additional galleries, containing 120 sittings, can at any time be erected in the transepts, on each side of the pulpit, should this be required. The building is estimated to cost about £5,200.

Rotherham.—On Saturday, the second schools erected by the Rotherham School Board were opened. The style adopted is Late Gothic. The gable over the boys' entrance is carried up to receive a bell, and the whole building is inclosed by dwarf walls and substantial iron railings. Rotheram red sandstone and dressed ashlar from Thrybergh quarries are used for walling, intermixed with red terra-cotta work, and suitable carving to relieve the work generally. The works have been carried out from plans by and under the superintendence of Messrs. Tacon and Rawson, architects to the board, Rotherham.

South Shields.—The Lord Bishop of Durham on Wednesday opened Holy Trinity Church, situate near the High Shields Railway Station, South Shields. The church has been during the past year and three months closed while undergoing considerable extension and renovation. The additions made to the building comprise north and south transepts, an organ chamber on a line with the south transept, and a large vestry on the north side corresponding to the organ chamber. Three more entrances have been provided, namely, on the north, west, and south sides. The whole of the internal fittings have been removed, with the exception of the font, the gift of the late Archdeacon Thorpe, and the altar rails, which are constructed of oak. The chancel, formed partly by the extension of the east end and partly out of the transept, from which it is separated by an open screen, is 40ft. in length. The woodwork of the screens is carried round the east end, the centre forming the reredos. The nave is 70ft. in length, and the transepts from north to south measure the same distance. In the arrangement of the galleries care has been taken to interfere as little as practicable with the appearance of the pillars which support the arches dividing the aisles from the nave. In the old building there were five arches on either side. To these an additional arch has been added, and the extensions north and south are supported by six other arches of similar proportions, so that altogether there are now in the edifice no less than eighteen arches. From the old galleries the first slab has been removed so as to leave the pillars quite clear, and the new galleries in the transepts are still further removed from the pillars. The church as now extended and altered will furnish sittings for 1,000 persons. The total cost of the work is about £3,000. The architects are Messrs. Austin, Johnson, and Hicks, of Newcastle; and the contractors, Messrs. Walter Scott and Sons, Newcastle.

Wakefield.—The new Clayton Hospital, Wakefield, was opened on the 30th ult. The building externally is Flemish in character, the total length of the main front is 287ft., with a central tower 70ft. in height. The hospital is planned on the pavilion system, with accident and special wards, operating theatre, day rooms and offices, arranged so that they may conveniently serve the purposes for which they are designed. The administrative department is placed in the centre of the building, with the kitchen, &c., at the rear. The mortuary and laundry is situated at the south side of the site. The staff entrance, under the tower, is approached from the new road on the north; the entrance for accidents in from Northgate. The porters' rooms are placed on the south side of the entrance, conveniently situated for the admission of patients; the out-door patients' entrance is from the new street at the rear of the site, and communicates with a spacious waiting-hall and with the dispensary department. The hospital in the first instance is constructed to accommodate fifty-two patients, with provision for future extension. The walls of the building are, externally, faced with Elland edge wall stones and ashlar dressings from the quarries near Huddersfield, and lined with brick. The whole of the work has been executed in a substantial manner, and special attention has been paid to the sanitary details of the buildings. The vitiated air will be extracted by means of air shafts, connected to the copper cylinders, which are placed in the roof and fitted with rings of gas jets, the exit shafts being carried into the ventilators provided for them. The hospital has been designed by Mr. William Bakewell, of Leeds, and carried out under his superintendence. The contractors are Messrs. Pickersgill, Craven, and Loyd, Rawsthorne, Stafford, Tattersall, and Rayner. The corridors and other portions of the building have been warmed by Messrs. Gath and Co., of Leeds, who have also fixed the electric bells and speaking tubes; Messrs. Shillito and Harrison have carried out the boundary railings and gates, and the gardens have been tastefully carried out by Mr. W. L. Skinner, of Silcoates. The total cost of the building and fittings will be about £20,000.

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More than Fifty Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation render its the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.C.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Correspondence.

ORNAMENTATION OF NAVE COLUMNS AT WALTHAM AND DURHAM.

To the Editor of the Building News.

Sir,—In your notice of the visit of the St. Paul's Ecclesiological Society to the Abbey Church, Waltham, Mr. G. H. Birch is reported to have remarked, when pointing out the peculiar ornamentation of the massive piers, that "the only other instance of like treatment which he remembered was Durham." I have not seen Waltham Abbey, but I know it by illustrations; I suppose Mr. Birch referred to the chevron or zig-zag, and a kind of cable fluting on the shafts of the circular columns. If that is what Mr. Birch referred to, I desire to give the parish church of Kirkby Lonsdale in Westmoreland as another example, for there several of the nave columns are ornamented in a similar manner. "Parker" mentions Lindisfarne Priory as another example, but I specially mention the first as not generally known.—I am, &c., J. H. M.

RAMSGATE PROPOSED NEW ROAD.

Sir,—Your correspondents, "Via Melior Iter Brevius," are, it appears, men of doubtful minds. They doubt the accuracy of my statement that the original model for these proposed improvements, which it was my privilege and honour to design twelve years ago, showed projecting pavements supported by iron columns resting on the Military-road. The reason for not showing these columns in the deposited plans was fully explained in my letter to the Improvement Commissioners, and published in your paper. To set this matter at rest, your correspondents have only to call upon me when next at Ramsgate, and they may satisfy their own eyes by an inspection of the original model. It appears, however, that this is now a matter of small importance, as the Board of Trade have resolved that the New-road shall not extend beyond the base line of the cliff along the Military-road. This will necessitate the pulling down of a few more houses than would otherwise have been necessary. In other respects the main features of the model are preserved.

But your correspondents are labouring under another doubt. They doubt whether or not the Commissioners have decided to adopt my plan subject to the approval of the railway company. Now, it is well known to thousands of persons in Ramsgate that a fundamental part of the plan shown on the model in question was, and is, the joint scheme of a new road and an extension of the London and Chatham Railway. This is not only shown in the model, but Mr. Forbes was consulted on the subject early in 1872, and invited to inspect the plans as shown thereon. Not only so; the joint scheme has been enunciated hundreds of times at public meetings in the Town Hall and elsewhere. It being, therefore, an indisputable fact that the proposal for carrying out this joint scheme has been before the Improvement Commissioners of Ramsgate for the past *twelve years*. The question now is—Do the Commissioners propose to carry out such a scheme?

The numerous competitors who, at an enormous expenditure of time and money, sent in plans may justly exclaim, "If the Commissioners of Ramsgate have resolved to adopt such a scheme, we have been befooled, as the 'instructions' did not even suggest such a thought." It is, however, none the less a fact, and not only did the chairman declare that the Commissioners could not carry out the new road without the aid of the railway company, but, as stated in my last letter, Mr. Abernethy and another engineer have been instructed to prepare further drawings for working out such plans. Soon after the "Improvement Act" for carrying out the proposed new road was enacted, the chairman of the Local Board sold to the town, at the rate of about £70,000 an acre, certain small property which obstructed the view of a new school he is building, and it is commonly thought by not a few that as "improvements" began at this particular spot—which is comparatively an outskirt of the town—so they will end there.—I am, &c.,

W. Vincent Green.

St. Lawrence-on-Sea, Aug. 4, 1879.

FARM PLANS AT KILBURN.

Sir,—It is sometimes remarked that in order to insure success a critic ought to be totally ignorant of the matter or subject to be criticised. I do not say that this is the case; but if it is, your correspondent "Agricola" ought to be one of the most successful and competent critics of the time. If he has not succeeded in attaining such a position, I candidly admit that he has at least deserved to succeed. It appears from the first letter he published in your columns that he has carefully avoided the old-fashioned and well-beaten track that critics of a less importance would have followed, and has abstained from making anything like an examination of the plans for the farm-buildings before he proceeds to criticise them. Further than this, it appears that so much does he rely upon the powers of his imagination for any required information, that he has disdained to read up a few facts published in the Building News, which might otherwise have been of some slight service. He "offers a few strictures on the commended plans, dealing with them in a general way." The vagueness of his strictures, however, does not hide their slatternly inaccuracy. "Agricola" informs us that *all* the commended plans show *open* or partially uncovered yards. It will scarcely be believed that six out of the seven commended designs show *covered* yards; the other one, "The Eye of the Master," &c., as mentioned in the Building News articles, stating that the open yard can be covered if thought desirable. Again, our friend remarks that "hardly one of the commended plans has more than one loose box, some of them none;" but "Agricola" is only slightly inaccurate on this point, for one or two of the designs, "Experientia," "The Eye of the Master," &c., do not show boxes, the others having from 4 to about 30 or 40 boxes of one sort or another.

These mistakes may be taken as samples of the sack, but there are a great many more that have already been corrected by Mr. Waite and others.

"Agricola," in your last issue, instead of acknowledging his mistakes, and apologising to the competitors, makes evasive, quibbling answers, not at all worthy of an English agriculturalist. He says he is not a competitor. Who cares a straw whether he is or not? His remark that he is not an architect is unnecessary and uncalled for. None of your readers could have imagined for one moment that he was one. I suppose, in this case, we must accept his statement that he is a farmer, however much we may question his right to style himself a "*practical* farmer." A practical farmer of the 19th century should have some little knowledge of agricultural science, and be able, at least, to understand a plan of a farm homestead; however, I am ready to acknowledge that "Agricola" is a *very* practical farmer.

The fact of the matter is, that "Agricola" has either never seen the plans at all, or else he has thoughtlessly undertaken to criticise them without taking the slightest notice of their arrangements.

Any stick is good enough to thump a dog with; but surely there is no reason why the authors of the commended designs should be treated in such a harsh manner. Justly, or, more correctly, unjustly, they have been deprived of the prizes due to them; why add insult to injury? Doubtless their designs are not without spot or blemish: what design ever was? and their faults ought to be criticised, and they are open to criticism; but let that criticism at least be made in a fair and impartial manner upon the merits of the designs—the real designs, and not the phantom productions of "Agricola's" imagination.—I am, &c., Husbandman.

W.C.'s IN BATH-ROOMS.

Sir,—We see in your paper a letter from a correspondent complaining of the practice of placing the w.c. in the bath-room, which is all very well protested against if the w.c. is a common one and fixed by incompetent hands. But we contend, and can prove it, that if the w.c. is trapless and is in connection with an *open* soil pipe that empties on to an *open* trap, that it will be as sweet as the waste from the bath; and further, we would guarantee to fix a w.c. in a drawing-room, and have no smell in the room whatever except during use.

We have fitted a great many closets in this way, carrying the soil pipe to roof and making it *trumpet* mouthed instead of fixing a cowl, and find a strong current of air enters the pipe at foot and is carried past the junctions with closets and so up to roof, so that should any sewer gas force its way through the open trap at bottom it is carried up the pipe and past w.c. junctions. The traps are always clean and contain nothing but water. We purpose fitting one up at the forthcoming Sanitary Congress. We should be happy to give any information if required.—We are, &c.,

Keen & Son, Sanitary Plumbers.

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A new church in Westgate, Lincoln, dedicated to St. Paul, was consecrated on the 29th ult. It is about 100ft. in length and 40ft. in breadth, will seat 502 persons, and has been built by Mr. Frank Binns, of Lincoln, from plans prepared by A. W. Bloomfield, Esq., at a cost of £3,680.

Intercommunication.

QUESTIONS.

[5855.]—**Marks on Deals, &c.**—What is the meaning of a black branded or stencilled letter on the edges of battens and deals which are presumably Swedish, as they are stencilled with red letters on the ends?—R.

[5856.]—**Styles of Architecture.**—I find there are many works and hand-books on Gothic architecture; but I have not yet met with one treating on the later and what I may perhaps term the Mixed styles—the Elizabethan, Jacobean, and Queen Anne. Will one or other of your readers kindly mention a work or two that I may consult?—Paddington.

[5857.]—**Oil Paint Blistering.**—Can any of the numerous contributors to this column inform me what is the cause of oil paint blistering so much more now than forty years ago, especially in outside work? A correct reply will no doubt be of value to many besides the writer.—R. Q. H.

[5858.]—**Brewery Floor.**—What is the best material to use for a floor of a tunning room of brewery? It is at present laid with concrete cement, but the acid has to a great extent destroyed it. Flags have been tried; but from the nature of the traffic soon get displaced and let the wet through joints to rooms below. Would asphalte be more satisfactory?—W. L. N.

[5859.]—**Purlins.**—Will some correspondent kindly oblige by stating why the purlins are generally placed as in Fig. 1, at right angles to the rafter, and also state if they would not be quite as well as regards strength, &c., when placed as Fig. 2, at right angles to the tie-beam?—S.

FIG. 1

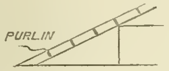
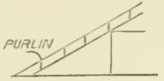


FIG. 2



[5860.]—**Painting on Glass.**—Can any of your readers refer me to a good work on painting on glass or give me any hints as to the colours used and general process? I do not mean Diaphanie or Vitremanie, or such processes, as these I believe refer generally to transferring stock patterns to glass, and are scarcely suitable. I should like to know how, as an artist or amateur, to render my own designs on glass and insure their permanency under ordinary conditions of sun and damp, &c.—B.

[5861.]—**Oak Trees.**—A gentleman having told me that he has within the last twenty-five years seen an English oak tree the trunk of which measured 100ft. long, and I having very great doubts as to an English oak ever attaining such a height, can any of your numerous correspondents tell me whether an English oak has ever been known to grow that height, and if so in what county?—D. H. W.

[5862.]—**A Contractor in a Fix.**—Will some friend kindly advise me, as I am in a considerable fix? Some five months back I took a contract to enlarge a country hotel, the specification for which states "the external face of walling to be kept as much as possible in character with the present building," saying nothing whatever about quoins, reveals, &c., which in the old house are plain hammer-dressed. In building the walls the architect (who by the way is not an A.R.I.B.A.), after one or two alterations in his ideas, ordered me to have all stones squared, the reveals and quoins punched, &c., and the reveals, in addition, to be rebated, which entailed a large amount of extra work. I should have said that the old wall is of the roughest rubble work and plain flat pointed. I pointed out to the architect at the time that it was exceeding my contract, and I should expect to be paid for it, but he now refuses to certify for any more than the original price. In my idea ranged stonework tuck pointed is worth about double (for labour) that in rubble. Again, the kitchen has had an extra range put in, a bedroom a fireplace, tiles in hall instead of paving, and numerous other alterations which alter the original idea very greatly. Could I not demand that the whole be measured up, and am I not justified in so doing, as it will be almost impossible to measure extras, they are so numerous?—Country Builder.

REPLIES.

[5787.]—**Strains on Collar Beam Roofs.**—In reply to "H. C. S.," the question originally under discussion was "will one of your kind correspondents show by means of a diagram the strains which come upon a rafter, the collar, and the supporting walls of an ordinary span roof, having its collars fixed so that one third of the length of the rafter is below them; no ties or purlins?" Now "H. C. S." has undertaken to show me where I am wrong, and begins by saying that collars ought never to be designed as ties if, as I understand him, the rafters are so weak as to be likely to sag, or the walls so high and thin as to be likely to be pushed out. I quite agree with him; but without going through the work of rereading the correspondence, I shall say that I believe I have nowhere said anything which could bear such construction when taken in conjunction with the rest of the correspondence. With respect to the iron roof I quoted I must concede that that did not really reach the mistake of supposing the collar in an ordinary span roof could be in compression for the reason mentioned by "H. C. S."; but at the same time what I said concerning the same was correct in principle. With respect to collars in compression, I must reiterate the sense of what I have previously stated—viz., that in a long length of roofing the usual economy of construction would prevent the walls being thick enough to resist the roof-thrust unless the rafters be tied at or near their feet, and that if a collar be used, it will be in tension and cannot be in compression at the same time, because if only lodged on or in between rafters it would fail to perform compressible duty, there being none for it to perform, as the rafters would prove by parting and allowing the collar to drop out. With respect to "H.C.S.'s" suggestion that I should consider a "roof of 18ft. span with 4 × 2 rafters, and collars half way up, the feet of the rafters being tied together," I agree with him that the collar is then in compression, but our conditions given by "S." did not allow of a tie at the feet of the rafters, and regarding the original discussion, that proves nothing; but as to the present I agree with him that the lower part of the rafter would have a great transverse strain on it where the fulcrum might be considered at the collar beam, and which would then be the weakest part. A roof should have rafters deep enough to carry their load without breaking, and such a roof as the latter should not be entertained as a possible design by any competent constructor. Then if we lower the collar to the plate level, as "H. C. S." suggests, it will be a tie beam roof in my opinion, whether it have a collar or not, because the tie beam takes a prior duty in comparison with that of the collar which could not exist in its place without the tie-beam, and "S's." conditions, as we have seen, prohibited a tie-beam. With respect to "H. C. S.'s" wish that an unknown someone may come forward and put the subject on a clearer basis, I do not think we require any such help, as it seems to me perfectly clear now, at least it is to me, and I believe that collar beam roofs of much span are usually skillfully constructed and their weak points well provided for by curved spandrel ribs, &c. To "G. H. G."—I did not consider a tie-beam, because the conditions did not allow of same. I quite agree with what "G. H. G." writes on this subject.—Henry Ambrose.

[5787.]—**Strains on Collar Beams.**—"H. A." says it would not pay to build walls strong enough to resist the thrust of rafter. I can prove from some practical experience the contrary. A roof 40ft. span, incline 60°, erected over public baths, constructed with collar beam half way up rafter, pushed the walls out before the whole of the slates were on. The walls had to be strengthened by buttresses. This was a proof to me of the false economy or the ignorance of the designer. Now, if this principal rafter had been strong enough to carry its load on the 40ft. span, it would have been a very ugly-looking principal; then why cut ¼ of the timber away for the insertion of a tenon at the centre or weakest part of the rafter? Would not a bolt in the form of a king-bolt be better for the strength? "H. A." says something about the sliding of plates. The principal does not rest on the top of wall, and therefore is loaded beyond the actual load of roof, which is quite enough to resist the lateral force exerted by the inclined load, taking the above incline as a fair, or, at any rate, the lowest pitch for collar beam roofs. "H. A." talks about lowering it to 30°. Why not go further?—I never saw one the latter pitch. He also says "S." is supposing an absurdity by imagining a collar and a tie-beam. Fig. 1 is a copy of an ancient one by Vitruvius (book IV.), which looks as well as many modern ones though not so economical as a queen-post truss, but it exerts no lateral thrust on walls, and therefore is more economical than a collar principal in the cost of timber and walls. I quite agree with "H. C. S." and "G. H. G." As to the oval (or circular if you like) plan; it requires no ties if the plates are properly secured at their joints; but the rafter must either be strong enough to carry the load distributed thereon, or must be supported by struts or collar, if you call it so, which would not be in tension in that case. The engineer's roof with five triangles "H. A." alludes to is the one sketched in Fig. 2, I suppose. Well, I don't see any collars in it, but there are two struts which are shown by thick lines, and the rafter is exerting the same thrust as a collar roof, but it is resolved on the tie rod, not on the wall, just the same as if the rod was horizontal. Of course the strain is greater on this position of rod. "H. A." takes exception to the term used by "S.," cross strain, otherwise transverse strain. Either term is correct. I must object to "H. A.'s" assumed infallibility. I suppose a questioner has a perfect right to criticise any answer he may receive, especially if it appears to him inconsistent on the face of it. Some people's knowledge of scientific matters are gathered wholly from the library or drawing-board

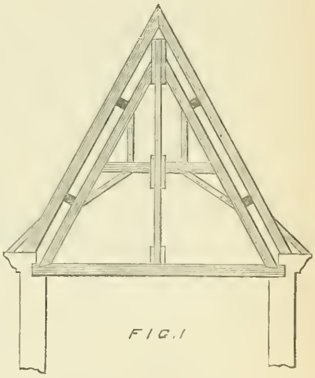


FIG. 1

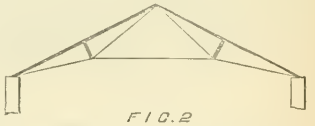


FIG. 2

instead of some from the workshop, which is the proper starting point for all scientific men. I hope the junior students will not be deterred from asking questions because some "prolific" correspondent will not condescend to argue any point because he has made up his mind that if he cannot convince you his is the correct method you are past instruction and not worthy of notice. The nonsense about a roof on rollers is not worth discussion, but it will take two-thirds the actual load on the wall to thrust the plate off the wall, and a load on an incline of 60° will not exert more than 30 per cent. lateral thrust, and "H. A.'s" figures for overturning wall will prove all I can give if he will take the weight on a roof 30ft. span, incline 60°, principals 10ft. centres, 1½in. boards and slates.—B. S.

[5828.]—**Modelling.**—"Amateur" seems to have a desire to model, but apparently does not fully understand the process. I would be willing to give "Amateur" a practical explanation of the art of modelling.—J. Lemon, 4, Sidmouth-street, Gray's-inn-road, W.C.

[5846.]—**English Ordnance Map.**—The new Ordnance maps may be obtained of Messrs. Stanford's, at Charing-cross.—H. G.

[5849.]—**Jewels for Reredos.**—If "Augustine" will apply to Messrs. H. Sibthorpe and Son, Dublin, he can obtain what he wants in red and green marbles of very beautiful colour.—D. A. L.

[5851.]—**Builder's Tenders.**—It will depend whether "A Young Builder" was requested to submit a tender as to any claim he has. If no drawings or specifications were prepared upon which to prepare an estimate, a builder would fairly charge for his time and trouble; but there is no rate of charge, and a builder has no claim in submitting a tender with other competitors.—G.

[5853.]—**Extras.**—As "Edward" has appealed to me for a reply, I may observe the "best manner of acquiring the proper and most business-like manner to make out a bill of extras" is to study a good bill, or to assist the surveyor employed and carefully examime a few accounts rendered for extras, which are readily obtainable from an architect. The proper way of making out a "bill of extras" is to measure up the work executed in addition to that described in the specification, then to price the various items according to the schedule submitted. I presume the question refers to "hills of extras" of buildings executed.—G. H. G.

[5854.]—**Railway Bridges.**—For wrought-iron girders 5 tons per square inch of net section is a safe working strain in tension. For compression 3 to 4 tons is the limit.—G. H. G.

WATER SUPPLY AND SANITARY MATTERS.

Goole Local Board—Old Goole Drainage.—A scheme of drainage was designed and prepared some months past by Mr. E. C. Buchanan Tudor, town surveyor and acting engineer to the Board, who recommended a main trunk sewer 4ft. 6in. by 3ft. for 430 yards, with an outlet into the tidal river, comprising Penstock, tidal valves, &c., and outfall-pipe of cast iron to below low-water mark. The scheme was considered efficient, and no objection was raised, but the cost was thought to he more than the Board felt should be expended for that district, and Mr. Tudor was instructed by the Board to prepare another plan and to cut off above 300 yards of the trunk sewer (the drainage being tide-locked for some hours), the main storage portion, and substitute a *pipe sewer*. After a delay of nearly twelve months the Board have decided to carry out the plan of the pipe and brick sewer combined instead of the one recommended by their surveyor as an efficient scheme. The surveyor's scheme has been since submitted to Mr. Bartholomew, C.E., engineer to the navigation, and confirmed.

Water Supply of London.—A public meeting of working men was held on Wednesday evening in Exeter Hall to consider the water-supply of the metropolis, at which resolutions were passed condemning its quality and cost, and urging upon the Government the necessity of creating a new authority and administration by Act of Parliament. Amongst the speakers were Sir Charles Dilke, the Bishop of London, Dr. Lyon Playfair, Cardinal Manning, and Mr. Holms.

LEGAL INTELLIGENCE.

Skirlaugh Church Restoration.—Botterill v. Whytehead.—In this case, tried at Nisi Prius at the Yorkshire assizes on Tuesday, before Lord Justice Bramwell, the plaintiffs were Messrs. William and William Henry Botterill, architects, Parliament-street, Hull, for whom Mr. Waddy, Q.C., M.P., and Mr. Sutton appeared; and the defendant is the Rev. Robert Y. Whytehead, the vicar of Nunkeeling-in-Holderness, whose counsel were Mr. Seymour, Q.C., Mr. Cyril Dodd, and Mr. Silvester. Mr. Waddy, in opening the case, said the libel complained of was a direct attack upon the professional position of the plaintiffs as architects. There was one element in the case which it was very undesirable to introduce, and if he did introduce it, it would not be because he simply wished to add fuel to the fire. Six or seven miles from Hull there is a place called Skirlaugh, where there is an ancient church which was traditionally said to have been built by an ancient Bishop of Durham. It was a rare specimen of the style of architecture it represented, and had been used in architectural books of instruction as a pure specimen of Gothic work. It had by degrees fallen into a state of dilapidation, and was crumbling away, so that as a place of worship it was actually dangerous. The church stood upon the estate of the Bethells, of Rise, and in 1877 a vestry meeting was held at which a scheme for the restoration of the church was considered. Mr. W. F. Bethell (formerly high sheriff of Yorkshire, and a trustee of the church) took great interest in the matter, 'and it appeared that the professional reputation of Messrs. Botterill having reached Skirlaugh, they were requested to look over the church, and to make an estimate of everything required to be done. Having done this, and a subscription list having been opened, Messrs. Botterill advertised in the *Hull News* and other newspapers on the 18th of April last, inviting tenders for the work necessary to be done in the restoration of St. Augustine's Church, at Skirlaugh. Everybody had clear notice and warning that the specifications and plans were ready at Messrs. Botterill's. At that time the plaintiffs and the defendant were strangers to each other, but two days after the advertisement before-mentioned appeared, the defendant wrote a letter to Mr. Bethell, of Rise, who was the chief donor to the restoration fund, stating that having seen it, he was sorry that the restoration of Skirlaugh Church had been placed in the hands of architects who could have no experience in church work, and asking if Mr. Bethell could not do something to avert the irreparable loss which must be caused if any of the masonry in this ancient gem of art were ignorantly tampered with. Now, said Mr. Waddy, no more direct attack could be made on the professional character of any man, but there were four words in the defendant's letter which he would not mention just at present. On the 10th of April Mr. Barnes, the Vicar of Skirlaugh, wrote to Mr. Whytehead, inclosing the architects' report, and saying that if he wished to be a subscriber, he might pay the amount to Mr. Spence, the vicar's churchwarden; but Mr Barnes also said no doubt need be entertained about the work being well done, and in perfect harmony with the original design. The next thing the defendant did was to prepare a memorial which he printed and circulated, begging that the Restoration Committee would use great care to prevent any addition, alteration, or reparation which was not necessary for the safety or the preservation of this "gem of ecclesiastical art," and that they would take care to intrust the work only to skilful and experienced hands. After that Messrs. Botterill called upon Mr. Whytehead for an apology, but that letter was treated with contemptuous silence; but he did address a letter to Mr. Bethell, whose reply was, "I really cannot undertake to interfere in this matter. . . . I wonder how many of the clergy whose names I see attached to the petition know much about architecture." (Laughter.) Mr. Waddy went on to say that now the time had arrived when he was bound to tell the jury what it was often undesirable to intrude, but which in the present instance was unavoidable, and which, more or less, involved the questions of High Church and Low Church and Broad Church. In a letter which he had already read he had omitted four words. In the letter of the 8th of April to Mr. Bethell, the defendant spoke of Mr. Botterill as "a Wesleyan who could show no experience in Church work." Messrs. Botterill being Wesleyans, that accounted for the whole thing. But if anything more was wanted, the defendant, in a letter to Mr. Barnes, said, "Are you aware that the Messrs. Botterill are Wesleyans, and cannot have any religious acquaintance with such work?" (Laughter.) Perhaps, said Mr. Waddy, the rev. gentleman did not know that some of the highest authorities on the subject of Gothic architecture had not had the good or ill fortune to belong to the Church of England; he did not know that some of the highest authorities had—save the mark!—been Quakers; and he did not know perhaps that among living architects there were several who had never entered a Church of England except for the purpose of either building or beautifying one. He (the learned counsel) would next read a letter from Mr. Bethell, which contained an exceedingly sound opinion, and one it would have been well for Mr. Whytehead to have acted upon. The date was April 11th.—"I confess I never heard that architects had anything to do with the Thirty-nine Articles, but I think in this case there is no danger of any misfortune arising from the heterodoxy of the architect, as all that is proposed is to replace the broken stones and mullions of the windows, and to put in new glass and repair the tower," &c. Before the plans were carried out they were sent to Sir Edmund Beckett—without exception the highest authority in England—and those plans came back with only two trivial alterations, one of them being the colour of the glass in the window.—Mr. W. Botterill, the senior plaintiff, was examined, and he said that Gothic architecture had been his study all his life, and he had both designed churches and restored old Gothic edifices. Because of this trial nothing had been done in the work of restoration, but the contracts had been let.—Mr. Seymour, in addressing the jury for the defendant, contended that his client had been fully justified in feeling that without experience in the restoration of ancient churches, Messrs. Botterill could not carry out the original style. The plaintiff had no experience of the kind of work which the defendant thought was requisite in this case. He also submitted that Mr. Botterill had sustained no pecuniary damage, and that the parties being quite strangers to each other, there could have been no personal animus or motive. There were architects of great eminence present, and they would say that, as an ecclesiastical relic, there was scarcely anything dearer or more valuable to the eye of an architect than St. Augustine's church at Skirlaugh. It was a work consecrated by history, and demanded the care, the respect, and the veneration, not only of Churchmen, but of the antiquarian and the architect; and surely, when it was proposed to take part of it down, an enthusiastic antiquarian like the defendant might be pardoned if he attempted to exact every possible security that the work should he done so that its antiquity would not in the least suffer. He (Mr. Seymour) denied that there had been any desire on the part of the defendant to introduce the *odium theologicum* into the discussion, but he felt that here was a building, 400 years old, which might be marred by a man not impressed by the veneration due to edifices of such antiquity, and he had not hesitated to say that Mr. Botterill was not exactly suited for such particular and difficult work. But was that a libel? Mr. Seymour argued that it was not.—The defendant, who was then called, said he had heard at a meeting of clergy that Messrs. Botterill were not the proper persons for the work in question, and having studied ancient architecture for years, he had felt that the sacred art at this Skirlaugh Church would be ignorantly tampered with by the architects who had been employed. For the purpose of showing that the means proposed by the plaintiffs for restoring this church were not suitable nor usual, nor well advised, and that the old stones should be retained instead of new resemblances being substituted, a number of specialists and experts were called, viz., Mr. Hodgson Fowler, assistant architect to the Dean and Chapter of Durham; Mr. F. S. Brodrick, of Hull; Mr. James Fowler, of Louth; Mr. H. Fawcett, of Cambridge; Sir Henry Dryden, of Northamptonshire; Mr. Cossins, of Birmingham; Mr. W. Morris, secretary of the Society for the Protection of Ancient Monuments, Mr. Jas. Hey, of Liverpool; Mr. G. Bradley, clerk of the works at York Minster; and Mr. Gilbert Scott. The defendant being recalled, said he had never had any doubt at all that a specialist should have been employed.—The Judge: Then, why did you not say so in your letter, and it would have done away with all this inquiry?—During Mr. Seymour's speech in summing up his case, he protested that Mr. Whytehead had never for a single moment intended to cast any imputation upon the professional skill of the plaintiffs.—The Judge: Why has he not said so before?—Mr. Waddy replied upon the whole matter in a rather humorous speech; and was specially earnest in maintaining that the defendant had shown malice after receiving conciliatory letters from Mr. Barnes, Mr. Bethell, and the Rural Dean, assuring him that the work of restoration would be carried out satisfactorily. In concluding his remarks, the learned counsel said he hoped the verdict would be one which would teach the defendant not to let his "enthusiasm" for art do injustice to other people, and would lead him to try to cultivate more of that spirit of fairness and justice to others which, he thanked God, was a great deal more lovely and praiseworthy than Skirlaugh Chapel, and which, he hoped, would last when Skirlaugh Chapel had disappeared for ever from the archæological curiosities of Yorkshire.—The jury retired to consider their verdict, and, after an absence of an hour and a quarter, returned a verdict for the plaintiffs; damages, £50.—The Judge: I give judgment accordingly, and certify for a special jury.

The Select Committee of the House of Commons who have been inquiring into the circumstances of the suspension of Mr. Goffin's certificate by the Science and Art Department have reported that just previous to the examination Mr. Goffin disclosed to his pupils, in certain science classes in the United Westminster Schools, the answers to a large number of questions in the examination papers, and that the statements in the petitions presented in favour of Mr. Goffin were false, and known to be so by some of the signatories.

A window has lately been erected at Tilbury church, in memory of Mr. William Brookes, J.P., Major Royal North Gloucester Militia, introducing the subjects, The Talents, and the Five Wise and Five Foolish Virgins, executed by Messrs. Heaton Butler, and Bayne, Garrick-street, Covent Garden, London, W.C.

Our Office Table.

A new basin, an extension of the East and West India Docks at Blackwall, was opened on Saturday. The new basin has an area of about six acres. It is irregularly shaped, the north quay being 600ft. in length, the east quay 455ft., and the south quay, between the new and the old locks, by which the enlarged basin is entered, 270ft. The wall of the dock, having a total thickness of 20ft. at the bottom and 8ft. at the top, is formed of Portland cement concrete, faced with 3ft. of stock brickwork. On the north and east quays extensive warehouses, three stories high, have been built, and improved machinery has been erected for loading ships and discharging cargoes expeditiously. The hydraulic machinery is in some respects peculiar. At the level of the first floor there is a strong gallery or upper quay, constructed principally of cast-iron and wrought-iron, and on this gallery are placed hydraulic quay cranes, so arranged that they may be readily adjusted to the position of a ship's hatchways, and yet so as to deliver the goods into the front loop-holes of the upper floors. Lines of rails are laid on the quays, and by means of a swing-bridge, worked by hydraulic power, the entrance to the import dock is crossed and communication thus established with all the principal railways of the kingdom. The new lock is 65ft. wide, and is fitted with two pairs of wrought-iron, double-skinned gates, which, hollow and like great caissons, are at once strong and buoyant. These gates are moved quickly and easily by hydraulic machinery. The works, which have taken three years and a half to complete, have been carried out at a cost of £240,000, under the direction of Mr. A. Manning, the dock company's engineer; Mr. B. Stockman, resident engineer; and Mr. R. L. Berwick, assistant engineer.

Speaking at a Court Dinner of the Founders' Company on Friday, Sir Frederick Leighton, who was accompanied by Mr. Whichcord, the President of the Royal Institute of British Architects, said: He knew no company which from his point of view could take a more comprehensive sweep than that over which the Master presided—he knew none which could penetrate and influence the lives of men more widely than the Founders' Company. Assuredly there was none which struck into the lives of men more dramatically or stirringly. To the founder's craft we owed the brazen tongue which invited us to almost all the salient acts of life—whether those acts were grave or gay, whether they were poetic or prosaic, whether men went to dinner or to the grave, whether they were taken to the font or went to the altar, whether they passed to the workhouse or ascended a throne—bells, merry bells, sad bells, cynically indifferent bells, accompanied them with their voices. The stateliest and most ambitious edifices raised by the art in which the Master had made himself a name had been devised to lift up to the sky these noisy-tongued products of the founder's art. And who but the founder solved in the last resort the great problems of international life? In this barbarous world was not the final court of appeal the cannon's mouth? But artists owed to the founders a more gracious boon—for it had been their privilege in days reaching far back beyond historic times to fill the world with innumerable forms of loveliness. The power to do this was a privilege, but it involved a responsibility which it would be difficult to overrate; it carried with it its corollary—the power to propagate ugliness, a power too frequently and too fatally exercised.

It is finally decided that there is to be no new National Gallery. We have spent too much money lately in gunpowder to spare any for art and science. There is little need to recall to mind the vexation and disappointment to which the profession has been subjected in connection with this matter. It will be remembered that after a competition and much discussion Mr. E. M. Barry's designs were accepted, and both Parliament and the public were assured that the work was to begin at once. The removal of the Royal Academy to Burlington House gave the trustees of the National Gallery abundant space, and everything seemed in a fair way. It was then asserted that the internal improvements could be best effected before the outside was touched, and for a year or more considerable sums were spent in enlarging the galleries, but on each occasion that a vote was taken there were plenty of assurances that the façade and exterior would be taken in hand forthwith. From an estimate just presented to Parliament we learn that £5,000 is to be given to Mr. Barry for not adopting his design, and that all idea of rebuilding the exterior is abandoned. There can be little doubt that the sum, large as it seems to pay away for nothing, can by no means compensate Mr. Barry for his trouble and disappointment in connection with the matter; the mistake is that the necessity should have arisen for paying it at all.

At a meeting of the diocesan committee with reference to the building of the new Truro Cathedral—the bishop, Dr. Benson, presiding—a decision was arrived at with reference to the proposal to erect a cathedral in accordance with the plans sent in by Mr. J. L. Pearson, architect, of London. The Earl of Mount-Edgcumbe (Lord-Lieutenant), who was unable to attend, wrote questioning whether the means or requirements of the county of Cornwall justified the executive committee in recommending the adoption of a scheme involving so large a present and prospective expenditure as would be necessitated by Mr. Pearson's plans. The executive committee, however, approved of the plans, and endorsed the architect's suggestion of undertaking the work in divisions, commencing with the choir and proceeding as funds would permit. Mr. Pearson's estimate is that the choir, with its aisles and substratum, and the connection with the south aisle of the present cathedral, would cost about £35,000, that the transepts up to the ridge of the roof would cost an additional £20,000, and that the remainder of the edifice, which would include the nave and aisles, and the lower divisions of the western towers, the baptistry, and the porches, would cost about £40,000. It was stated that the total amount of the subscriptions promised was £32,715; but a good deal of this is spread over 10 years, and £10,000 has to be deducted for the purchase of houses to add to the site. It was ultimately agreed that the plans of Mr. Pearson should be accepted, and the committee were empowered to proceed with the shell of the choir as far as the money in hand will allow.

In the Building News for July 4th last we referred at some length to the advantages and objections of the several kinds of architectural drawing-inks, and in the course of our remarks we took occasion to point out the chief faults of the new ink for architectural purposes lately introduced by Mr. Featherstone, of Chertsey. Since our remarks were published, the manufacturers, Messrs. Boyce and Son, chemists, of the same place, have devoted some time, in conjunction with the inventor, to overcome the failings of the ink which we alluded to, and they have forwarded us another sample for our further opinion. It will be remembered that our chief objections to the ink were, firstly, that it was easily rubbed off, both by the damp hand as well as by the use of indiarubber, and that on exposure a film-like sediment formed in the ink, rendering its use attended with difficulty when fine lines were desired. We have now subjected the ink, as improved by the makers, to another trial, and we think the faults which existed in the ink as first made have been overcome as far as its use for pen-and-ink drawings are concerned; that is to say, it will not rub off in the ordinary way by the damp moisture of the hand, though it cannot be said that it has been rendered sufficiently indelible for drawings on which colour or washes are to be used. For line drawings intended to be reproduced by photolithography, probably no better ink could be found in the market, as it has a more intense blue blackness than Registration ink, which particular tone gives such richness to a pen-and-ink picture, and avoids the dull grayness generally observed when Indian ink is used. It should, however, be used only on quite white, hot-pressed drawing-paper, and the same care to avoid anything like excessive damping in the process of mounting must be carefully observed as in the case of drawings made with Registration ink. If these simple precautions are attended to, we think our readers will, after a trial, be glad to avail themselves of Mr. Featherstone's new ink.

Holloway's Pills.—Typhoid and other Fevers may be arrested in their early stages by a course of these purifying Pills. This medicine controls the circulation, lessens the shivering, and modifies the hot periods. Holloway's Pills relax the parched skin, diminish the excessive thirst, clear the furred tongue, and restore to health.—[Advt.]

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of Fevers, Biliousness, smallpox, skin diseases, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[Advt.]

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CHIPS.

The grave of Robert Devereux, Earl of Essex, the Captain-General of the forces of the Parliament under Oliver Cromwell, who commanded the Roundheads at the defeat of the Royalists at Newbury, has lately been discovered in Westminster Abbey and identified. The Dean and Chapter are about to have some suitable mark or memorial erected in the Abbey in order to commemorate the patriot warrior.

A loan exhibition of works of art is being got up in Chester on behalf of the School of Art of that town, which is greatly in need of funds. The Duke of Westminster, who is taking an interest in the undertaking, and whose presence is expected at the opening ceremony on the 11th inst., will contribute to the collection.

On Thursday week the Church of the Sacred Heart, at Ilkley, was opened. The church is Gothic, and is calculated to hold above 200 persons. Mr. Simpson, of Bradford, is the architect. The total cost will be about £1,600.

A letter from Milan of July 13 announces the death of the Cavaliere Carlo Annoni, parish priest of Vittuone, near that city, well known for his thorough acquaintance with Italian archæology, especially in its Christian departments. Mommsen speaks of him in his work on Latin inscriptions as *vir doctus et probus et laboriosus.*

A Local Government Board inquiry was held at Wrexham on Wednesday week, before Major Tulloch, with reference to an application from the town council for sanction to borrow £4,500 for improving the footpaths of the borough.

A steam laundry and public baths have just been opened in Nelson-street, Dereham-road, Norwich. Mr. E. Boardman, of Norwich, was the architect, and the engineers were Messrs. Riches and Watts, of the same city; the builder, Mr. Wilkins.

At a meeting of the Finance Committee of the Corporation of Hereford, held on the 29th ultimo, the tender of Messrs. Hall and Co., Ettingshall, near Wolverhampton, was accepted for their ferrumite paving flags.

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TENDERS.

Arundel, Sussex.—For new boys' school, for His Grace the Duke of Norfolk, E.M. Messrs. J. A. Hansom and Son, architects:—

MacManus, P. J.	£4,072	0	0
Chinnock, G. W.	3,986	0	0
Traske, C.	3,959	10	6
Keefe, P. J. O.	3,838	0	0
Bowyer, J. and C.	3,760	0	0
Beale, W.	3,750	0	0
Jones, D. C.	3,637	0	0
Longley, J.	3,620	0	0
Claridge, C.,(accepted)	3,590	0	0

Bedford.—For villa residence, Ashburnham-place, Bedford, for W. Finlinson, Esq. Mr. John Day, architect, 12, Victoria-terrace, Bedford:—

Haynes	£1,340	0	0
Spencer	1,325	0	0
Foster	1,307	0	0
Smith	1,201	15	0
Potter	1,200	0	0
Litchfield	1,198	0	0
Lilley	1,195	0	0
Warton (accepted)	1,160	0	0

Bedford.—For additions to the American Meat Stores, Prebend-street, Bedford, for Mr. W. Aimsden. Mr. John Day, architect:—

Howcutt	£470	0	0
Moore	445	0	0
Spencer	436	0	0
Haynes	424	0	0
Warton (accepted)	400	0	0

Bedford.—For new fire-mains, hydrants, &c., at the Bedford General Infirmary. Mr. John Day, architect:—

Kilpin and Billson	£165	15	0

Brompton.—For repairs to a house, New-street, Brompton, for the Rev. D. Morgan. Mr. E. Witts, architect and surveyor:—

Carter	£120	0	0
Noah	90	0	0
Crosbie	72	0	0
Williams (accepted)	62	0	0

Clophill, Beds.—For general reparation of the interior and exterior of the parish church and chancel. Mr. John Day, architect, Bedford:—

	For church.			Chancel.		
Haynes	£267	0	0	£26	0	0
Foster	261	0	0	28	15	0
Kimberley (accepted)	250	0	0	21	17	6

Desford.—For new industrial school at Desford, near Leicester, for the Leicester School Board. Mr. E. Burgess, architect. Quantities by Mr. W. Thornicraft:—

Hutchinson, J. and Son	£13,669	0	0
Major, F.	13,548	0	0
Parnell, J. and Son	13,515	0	0
Kellett, J. C.	12,879	0	0
Kirk and Randall	12,704	0	0
Herbert, T. and H.	11,920	0	0

Hampstead.—For house and shop at High-street, for Mr. R. Keil. Mr. J. Tanner, architect:—

Eaton	£1,160	0	0
Hobson	1,146	0	0
Hayworth	1,127	0	0
Butcher, W. H.	1,045	0	0
Mustoe	1,000	0	0
Grey, H.	999	0	0

Lee.—For repairs to the exterior of 33 houses at Lee, for J. Todd, Esq. Mr. E. Witts, surveyor:—

Hatfield	£672	0	0
Carter	495	0	0
Williams	260	0	0
Bush (accepted)	206	0	0

Lee.—For repairs to the interiors of five houses at Lee, for J. Todd, Esq. Mr. E. Witts, surveyor:—

Hatfield	£272	0	0
Williams	110	0	0
Jeal	89	0	0
Bush (accepted)	82	0	0

Leicester.—For new board schools in Katherine-street, Leicester, for the Leicester School Board. Mr. E. Burgess, architect. Quantities by Mr. W. Thornicraft:—

Kirk and Randall	£9,499	0	0
Kellett, J. C.	8,652	0	0
Hutchinson, J. and Son	8,064	0	0

Lincoln.—For additions and alterations to Lincoln Lunatic Hospital. Mr. M. Drury, architect. Quantities provided:—

Martin and Sims	£865	0	0
Morgan	841	14	0
Hatcliffe	837	6	7
Baines	811	10	0
Barnes and Wright	799	0	0
Thorpe	789	7	4
Otter and Elsey	769	10	0
Chambers	750	0	0
Taylor	725	0	0
Crossby and Sons	690	10	0
Cliffe and Cox	625	1	10

Lincoln.—For pumping station, sewerage works, Lincoln. Mr. A. J. Mansergh, engineer. Quantities provided:—

Kellett and Bently	£2,704	0	0
Close, H. S. and W.	2,992	11	10
Barnes and Wright	3,055	0	0

Liskeard.—For alterations and additions to the Bible Christian Chapel, Liskeard, and reseating. Mr. A. E. Skentelbery, architect, Looe:—

Godfrey, I.	£573	10	0
Pooley, W. I.	558	0	0
Olliver, W.	533	0	0
Trehane, S.	517	0	0
Nicholls and Son	509	0	0
Whale, I. T.	485	0	0
Pooley, W. P. (accepted)	397	5	0

Liskeard.—For the erection of school, classroom, offices, boundary walls, &c., at Dobwalls, to accommodate 80 children, for the Liskeard United District School Board. Mr. A. E. Skentelbery, architect, Looe:—

Pooley, W. I.	£464	7	0
Nicholls and Son	454	10	0
Godfrey, I.	430	0	0
Trehane, S.	420	0	0
Laundry and Greet	416	0	0
Laundry and Hambly	413	0	0
Northcott and Son	408	0	0
Smith and Marks	404	0	0
Northcott, C.	398	0	0
Whale, I. T. (accepted)	376	0	0

Maidstone.—For the erection of a vicarage house for the parish of SS. Michael and All Angels, Maidstone. Mr. Hubert Bensted, architect, Maidstone. Quantities by Mr. Edward Young, Tunbridge-wells:—

Foad, Whitstable	£2,698	0	0
Vaughan, Bros., Maidstone	2,590	0	0
Cox, Bros., Maidstone	2,545	0	0
Avard, Maidstone	2,520	0	0
Wallis and Clements, Maidstone	2,498	0	0
Reeves, Staplehurst	2,434	0	0
Beale, Battersea	2,397	0	0

Newark-on-Trent.—For the erection of two residences and out-offices, situate in New Sleaford-road, Newark, Notts., for Mr. Smith. Mr. R. W. G. Hayward, 6, Bargate, Newark, Notts., architect and surveyor:—

Accepted tenders:—

Excavator, labourer, and bricklayer:—	Crossland, F.
Carpenter and joiner:—	Dobney, E. G.
Stonemason:—	Thrale, C.
Slater:—	Dobbs, Thos.
Plasterer:—	Cobham, T.
Painter:—	Cubley, W. S.
Plumber and glazier:—	Bousfield, E.

Southall.—For machinery &c., at the St. Marylebone Schools, Southall. Messrs. H. Saxon Snell and Son, 22, Southampton-buildings, W.C.:—

Williams and Sons	£1,335	12	6
Clements and Co.	1,300	0	0
Benham and Sons	1,019	14	0
Warner and Lee	979	10	0
Quain and Co.	885	0	0
Neale	881	10	0
May, Bros.	840	0	0
Clarke	830	0	0
Eagle Iron Works	778	0	0
Potter and Sons (accepted)	740	0	0

S. Neots, Hunts.—For additions to the premises occupied by Mr. J. Beagarie Draper, for R. Fairley, Esq., Leamington. Mr. John Day, architect:—

Edey	£200	0	0
Hinde	175	0	0

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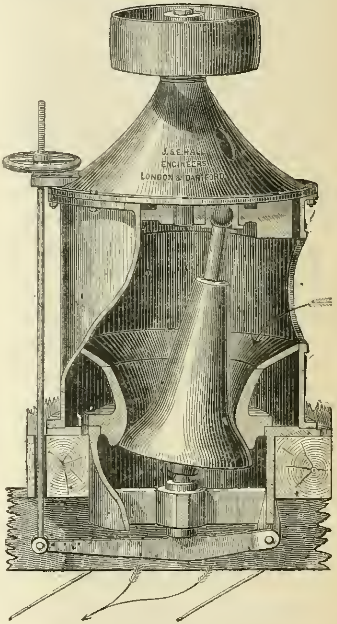

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THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 15, 1879.

THE OVER-DARWEN TOWN HALL AND MARKET COMPETITION.

THE limited competition for the New Town Hall and Market of Over-Darwen has, without doubt, resulted in a number of unusually creditable designs. The gentlemen selected by the committee include the names of many able members of the profession and contributed also to the success of the competition. They were Messrs. Alexander and Henman, Stockton-on-Tees; Beaumont and Somerville, Manchester; Charles Bell, London; Isaac Booth, Halifax; James Dean, R. Knill Freeman, Bolton-le-Moors; G. E. Grayson, Liverpool; A. Hill, Leeds; Holtom and Connon, Leeds; Edward Hughes, Huddersfield; John Johnson, Queen Victoria-street, London; Messrs. Ladds, Powell, and Aspinall, London; Lockwood, Smith, and Heathcote, Manchester; J. Y. McIntosh, Barrow-in-Furness; T. Mitchell, Manchester; T. Nicholson, Bristol; T. Oliver, Newcastle-on-Tyne; Richard C. Page, London; Geo. Patrick, Adelphi; H. J. Paul, London; S. L. Swain, Solomons and Ely, Manchester; Tait and Langham, Leicester; and R. Walker, Moorgate-street. Further, the conditions of the competition, creditable alike to the Corporation and their surveyor, gave very clear instructions; and the fact that Mr. Alfred Waterhouse, A.R.A., would be the referee, and that the Corporation had agreed to adopt his award, further inspired the confidence of the competitors. The site selected was one of unusual difficulty to the architect: it forms at present a rugged and desolate-looking space, with considerable difference in the levels, behind a small class of property in Market-street. The river Darwen and the reservoir, cutting as they do across the site, will have to be dealt with; but the most awkward part of the problem was to arrange the market-house in the least objectionable manner, leaving a sufficient space between it and the proposed town-hall. It is much to be regretted that the front property facing Market-street cannot be acquired for the purpose of so important an addition to the architectural improvement of Darwen; and we still hope the Corporation will keep in view the advantage of removing the block, so that both buildings may be thrown open to the main street. If the town-hall could have been placed at the corner of Church and Market-streets, the architectural gain would be considerable, and we are sure the Corporation would, by the improvement of the adjoining land at their disposal, quickly recoup themselves on the increased outlay. Although the Corporation suggested the position of the sites for the two buildings, we observe that some of the competitors have judiciously deviated from the boundaries assigned for the market by making the proposed street separate the old houses from the new market structure instead of cutting up the area as shown on the plan. We decidedly think this an improvement. Indeed, we are rather doubtful whether the axis of the market would not be better turned round, though the open space between the building would be curtailed thereby. We certainly doubt also whether a street in the position shown is so obvious a necessity under the circumstances.

Taking the designs in the order in which they have been hung on the screens—we may here congratulate the Corporation upon the average excellence of the drawings as a whole, and their surveyor, Mr. Scholes upon the judicious hanging of the several sets. We shall first speak of those which appear to have successfully grasped the problem. The first screen contains one or two excellent designs. "Thor" is a very well thought-out set of drawings; the plan of offices and market is not so compactly grouped as we should like, nor quite so well classified. Among the conditions that appear to us to be of crucial importance, is the provision of at least two entrances to the ground-floor, so that the official, municipal, and magisterial businesses may be distinct and not clash with one another. The sudden fall of the ground has operated against sufficient ingress in many cases, but the public hall should have a wide entrance, out of the way of the offices. "Thor" provides two entrances, one in the centre (carried up as a tower), which leads to a central hall and staircase, and another at the east side. The police department is located towards Market-square, the justice and municipal offices in front, and the council chamber and town hall on the first floor. The latter is placed on the east side, and forms a cross wing with gabled end, pierced by three windows towards Church-street. The council chamber is at the west side, and flanks the front. In an alternative plan the author shows the town hall practically isolated at the east end from the municipal offices. We prefer the Classic design, in which the tower forms a feature of severe outline, dividing the two parts of the structure. The front of the assembly hall has a tetrastyle portico (Ionic) on a podium. The council chamber forms a well-proportioned arcaded centre to the official block, the town clerk and the mayor's apartments making the wings. The borough surveyor is located in the east wing in rear, and the court forms the north end of the west wing. The cubing is taken at 9d. a foot, and that of the town hall and cellarage at 8d., the total estimate being £35,000—very good prices. The perspective of the Gothic design is weakly drawn in pencil. "1879" is the motto of another very able Gothic design of a domestic character, with mullioned windows and a tower entrance to Church-street, the merits of which are well represented by a clever sepia perspective, pleasingly grouped in parts, with the public hall distinctly pronounced by a broken gable-end. The plan is on the central court principle. There are two good entrances, one to the court and another to the municipal offices, the latter being in front and the former on the east side from the square level. The town clerk is on the left of entrance, and the collector and gas and water inspectors on the right, approached from a central hall, a little on one side, lighted by a centre area. The surveyor's offices are well placed for light on the north side, and the police-court is also on this side, well lighted from the square, and also from the area. The author raises his ground floor several steps from Church-street. We do not like the position given to the gas and water offices, but on the whole the plan bears evidence of careful study; the basement is tolerably lighted by a middle court, and the lobby entrances to the offices on ground floor are desirable points. The public hall is on the eastern side, 84ft. by 43ft. Referring to the market, it is judiciously arranged, so that the space for potato and fish may separate the old houses from the market proper, which is covered by two parallel circular iron-ribbed roofs, with glass on Rendle's system on the north side. Entrances are provided at the end, and also laterally. The elevation exhibits a clever treatment towards the square. The cubing is 783,814ft. for the town hall, put at 10½d.—not a high price—including fittings, which brings the estimate to £34,293.

We now come to an ably planned, compact, and well-balanced arrangement under the Shakesperian motto "As You Like It," illustrated by 19 drawings. The author has boldly departed from the suggested position of market by interposing the proposed street between it and the old property on the west side, while he has placed his fish market where it should be, on the eastern side. Unquestionably, this deviation is a very desirable point: it detaches the market entirely, and we consider it to be the strongest point of the plan under notice. In the main structure the author has shown also considerable skill in the distribution of his departments, which are of the full areas required, and are well lighted, and provided with entrances—one in the centre of the façade for the general use of the public, and the other at the north-east corner for the police-court. The basement appears to be one of the best arrangements as regards the separation of the police and cells from the fire-brigade and sanitary departments; there are two separate entrances facing the square, and another for sanitary inspector, and the corridors are tolerably well lighted, with domestic offices in front. On the ground-floor the central entrance is made an imposing feature, having a slightly recessed portico of six columns, reached by several steps. The square vestibule leads to a grand staircase immediately to the right, and to a wide corridor running lengthwise, but returning at right angles to large square stair-lobbies, through which light is obtained. The separation of vestibule from the principal staircase by an arcade, and the symmetrical arrangement of the main corridors are cleverly worked out; the town-clerk's offices are conveniently located on the left of entrance, approached by the corridor and lighted from the front; the treasurer occupies rooms facing the west side, while the police-court and magistrates' offices make the eastern side. On the north, ample lighted, are the borough surveyor's offices, approached from the centre, and also by the return corridor on the east side. The staircases at the north ends of these corridors give access to the assembly hall at its ends, and to the council chamber on the first floor. We observe a separation of the official departments by this arrangement of corridors, and the gas and water and school-board offices, so much in use by the ratepayers, are well placed for convenience of access. In the centre, along the side of main corridor, where light is less ample, are the muniment and safe-rooms. As regards lighting, we find, although no areas are provided, there will be direct light from the hall windows, besides that afforded at the ends of corridor. The great hall is reached by three staircases, and is placed on the north side, centrally between the lateral corridors. It is surrounded on three sides by corridors, and has several entrances along the side and at the two ends. There is a raised orchestra at the east end, and a narrow gallery along two sides, with conveniences. The hall is top-lighted all round by a row of dormer windows in the Mansard roof, and which form lunettes in the cove of ceiling internally. The council-chamber and mayor's apartments are on the west side. The hall and court are well proportioned. The external design is Classic of a somewhat ambitious type, massively grouped, resembling in its chief features the Bolton Town-Hall. We should have preferred a curtailment of the Corinthian portico, which is rather overpowering for the contracted site facing Church-street. On the whole, however, this design exhibits such distinguished merit of plan and architectural arrangement of parts that we place it high in the competition. The market structure is cleverly treated. The roofing is of iron, formed in three main parallel roofs, with a domical lantern in the centre, well contrived for light. The shops surround the market, and the elevations and details of entrances are particularly characteristic and well worked out. The cubing is worked out at 1,081,678ft. priced at 7d., and the total estimate £34,948. The market is priced at 4d., and comes to £10,844. "Municipal" is shown by a well-drawn and highly-artistic sepia perspective and elevation, evincing a master's hand in the detail. Queen Anne, with mixed features, is the style adopted, picturesque and well broken, but too domestic in feeling. The plan is less happy. It has a centre stairs and area for light, and two parallel corridors lighted at the ends, and by the said area On the ground-floor the town clerk and accountant are located in front, on the left of entrance; the gas and water department is to the east, and the surveyor on the north side. The borough court occupies the west side, between the corridors, but is not well provided with entrances. There are only two entrances, one for the offices, and one for the mayor. These are small and contracted, the municipal entrance is not dignified enough, while the tower only emphasises the muniment-room. The assembly hall, 90ft. by 45ft. is on the east side, with recessed balcony on the outside, but the hall is unpronounced in the front. The corbelled treatment of council chamber windows, the gables, and tower are exceedingly picturesque, and give a quaintness to the front; and the east-gallery elevation is very piquant. The basement is compact; there is an open court for light in centre. The estimate for town hall is £34,884; that for the market, £14,500. One of the most artistic Gothic designs bears the motto from Goëthe, "Only Perfected Strength Discloses Grace." It is illustrated by a masterly set of drawings, in ink, with clever sketches of principal entrance and details of hall. The ground plan shows a tower entrance on south side, a witnesses' entrance at the south-west angle, and a central hall and corridors surrounding an open area. The town clerk's offices are in the front, and the borough court on the west sides; the other departments are fairly separated, but defective in the entrances. The basement is ill-adjusted, and we see only one main entrance. The public-hall is on the west side, not well proportioned, but made a prominent feature of the main elevation. Though broadly treated, the elevation wants coherence; the municipal offices are low and rather unofficial looking, and the detail is decidedly too ecclesiastical in spirit. An alternative Renaissance design, rather frittered in parts, is shown. The plans are flashily coloured and finished. The cubing is at 11d. for town hall and 4d. for market, and the estimates £34,060 for the town hall and £14,350 for the market. "Q. E. D." This is also a very masterly design, conceived in a species of French Gothic, of a more suitable type than the last mentioned. A tower, dignified and broadly treated, and a well-treated gabled hall with angle turret on the east side are the main features of the elevation, the detail being excellent of its kind. The plan is generally well considered: it is arranged upon the central area and hall principle; there are three entrances: one at the west side, to the police-court, a central tower entrance, and one at the east side. The municipal offices are well cut off from the police. The market occupies the whole space, and is roofed in three span roofs, and its elevation is well treated in a Late Gothic. The cubing is taken at 9d. a foot for town hall, and 3¼d. for market, the estimates being £31,254 and £14,771 respectively. "Hexagon" is another clever drawn and tinted set, in Gothic; the detail is pure enough, but too elaborate, and the tracerid windows to the committee-rooms are a little out of keeping. The gabled hall on the east side is enriched with bas-relief panels between the windows. Of the plan we cannot speak much in commendation :, there is only one entrance to the ground floor, the large groined hall is wasteful and ill-lighted, and the hexagon lobby strikes us as being a conceit more ingenious than artistic. The approaches to the offices are too crooked. There is a centre hall for light. The tower is graceful in outline, and the detail and termination are good; it marks the main staircase. The plan is cubed at 9d. for the town hall = £32,959, and 5d. for the market = £13,269. "Croquis."—The design under this motto is a clever Gothic conception, introducing French Renaissance and decided Late Gothic features. The main entrance, with ramped steps, is marked by a tower flanked by circular turrets, and the hall is an imposing gabled mass, with turrets and pointed roofs on the east side. The circular turret feature is overdone; it is shown at every angle, and the design is rather suggestive of a residence than a municipal building suitable to Over Darwen. The entrance leads to a grand hall and staircase, lighted by an open court. The surveyor's offices are queerly obtained below the assembly hall, while the police-court entrance and borough court occupy the remainder of the space on the east side. The municipal offices are approached by corridors, but the departments are mixed up undesirably. The markets are turned with the axis north and south, and a wide street is provided between it and the old buildings – a point we have before spoken of with commendation. The town-hall is cubed at 10d. = £35,600; and the market at 5⅓d. = £15,240.

"Motto Plan."—This is upon the central hall and corridor principle, but the offices are ill-arranged. We do not like the angle doorways, nor the queerly-contrived passages to the police-court and solicitors' offices. The public hall is placed east and west behind. A clever and elaborately-drawn ink line perspective, with central tower, accompanies the drawings. The author has a lofty and dignified tower, but it is spoilt or rendered somewhat grotesque by the circular quadrant-shaped features filling up the outer angles, which are really nothing but porters' rooms below; the tower is rather cut up, and the lofty chimney stacks overtopping the side wings, which are roofed with steep-pointed hipped roofs, have an exaggerated effect. The bays to council chamber and the offices on right are scarcely dignified enough. The estimates are £36,000 for hall, and £14,000 for market.

"Central Tower" is a design of a Renaissance character, rather monotonous in its features. The market house is arranged upon the suggested lines, and is roofed in three. The town-hall has a central entrance and corridor, lighted by two inner courts—the surveyor is on the left and the town clerk on the right, and the gas and water in the rear. The council chamber is placed at the south-east corner and the hall on the east side (87ft. by 43ft.). Generally the internal access is faulty. A feebly drawn perspective accompanies this set. It is cubed at 10d. for the offices, and the estimates are £35,260 and £12,000. "A Rising Borough" is the motto of another cleverly-treated Mixed Renaissance design, more English and Domestic in spirit, and well grouped, but the defect of the elevation is its lowness. It has not the dignity essential to a town hall, however, and we say this without underrating its merits artistically. The plan adopts the two-corridor and open-court principle. It has a corner entrance to the police-court and a tower entrance at south-east corner. The police-court occupies the space between the corridors. The chief public offices are conveniently placed in front. The great hall, 108ft. by 58ft., exclusive of orchestra, is on the east side, and on the ground floor (a departure from the suggested instructions), cut off by a corridor below, and by a gallery above. The buildings are cubed at 7⅛d for the town hall = £33,536 and 6½d. for the market = £14,379. The market building is well separated from old property by a cart-road on the west side, and the author shows a row of proposed shops in Railway-road on the east side. The market is roofed with three parallel hipped roofs with centre lantern, and a very sensible treatment of the market entrances with some good details of roof are shown. "St. George" is perhaps inspired by the Manchester Town Hall, as it certainly vaguely suggests that source. The drawings at any rate do not do it justice. The entrances are inadequate and poor, and one of the inner corridors is ill-lighted. There is a central staircase. The public hall is on the west side, and the borough court and council chamber on the east; but the departments are not well classified. An alternative design exhibits an ill-balanced and drawn Classical composition, the tower and hall forming a one-sided overpowering mass on the west side. The estimates are £33,080 and £12,500. "Caer Lleon." This is a fourteenth century Gothic building, domestic and florid in character, shown in two neat line elevations. The principal features are corbelled oriels, and a central tower to the south front. The oriels are roofed by steep roofs, but the tower termination is too heavy. There is a central vestibule and stairs leading to a general hall and two lateral corridors lighted at one end; these lead to the accountant's and surveyor's offices on the left and right respectively. The town clerk's offices are at the east end, and certainly not in a good position, while they are approached by a narrow, badly-lighted passage. The public hall is on the north side, 100ft. by 45ft., not very well placed for access. The market is roofed in one span iron roof, with ridge lantern. The prices for cubing are 10d. for the town hall, and 5d. for the market, and the total estimate for the former is £32,726, and of the latter £17,257. We may briefly notice two or three other designs. "Let there be Light" is in an attenuated and feeble kind of Gothic, with pointed windows, and lofty, badly-proportioned tower. There is a grand stairs in the centre, with area for light, and surrounding corridors—an extremely expensive and undesirable plan. The offices are not economically disposed, and there is waste space in lobby and narrow passage to w. c. The borough court is on the north-west corner, and the town clerk offices in front awkwardly managed as regards the doorways. There is but one entrance to the ground floor. The market is spoilt by corner roofs, which have a flimsy, toy-like effect. "Pax et Labor" is a poorly-drawn, florid Italian design, with tower adorned by overhanging turrets and cupola. The plan is hopelessly confused and frittered away, and the corridors have borrowed light. The hall, 76ft. by 54ft., is out of all proportion. "Plan in Circle" is also too extravagant in the hall and corridors.

Artistically treated is "To be, or not to be." The elevation is in a highly elaborate French Renaissance, with circular corner turrets, but too domestic and expensive in detail. The faults of the plan are: inadequate entrances, there being only one, bad lighting of corridors, and bad proportions of assembly-hall on the west side, which is quite square, with two rows of pillars. An alternative plan in Gothic shows more compact arrangement with front hall, and a separate entrance to court. This design is uncommonly like a church, while the market is in ludicrous imitation of a nave and two aisles, roofs, galleries, and all, and has a flèche in centre. The Italian elevation is more characteristic. The author sends, in all, 22 drawings, many displaying considerable skill in draughtsmanship.

We have thought the merits of the designs deserved a rather particular notice, and have therefore gone into some detail. As will be seen, the plans divide themselves into those lighted from without and those by centre courts. There can be little doubt which is the most desirable mode of lighting. The town hall plot does not cover a large area, and, therefore, we should prefer a design which dispensed with inner areas, other things being equal. The provision of sufficient entrances, so as to separate the judicial and police from the official departments, ought obviously to be one of the determining principles; the next should be well-lighted corridors, and the absence of dark corners and wasteful spaces. The public hall should be, if possible, capable of separation from the offices, so that it may be used for assemblies without interfering with the municipal business. There are many other details, though of lesser importance, to which we have not referred, such as the means of warming and ventilation; to these Mr. Waterhouse will, no doubt, direct his attention; but we think the points we have suggested should determine the selection in the first instance. The appointment of so eminent an architect is a guarantee of straightforward dealing on the part of the corporation, though it has, apparently, largely influenced the competitors in adopting the Gothic style. With a few exceptions, the designs are all conceived in this style. We rather wonder, seeing the conditions left this point open, that so few Classic or Renaissance designs have been sent in. We find, locally, a strong predisposition in favour of a Free Classic type of structure, dignified in its leading features and lines, that shall harmonise with the predominant square and horizontal masses of the existing architecture. The durable and warm-coloured sandstone found in the district supplies another reason for the selection of the style we have indicated. Any display of towers and turrets, pointed and elaborate details, would appear to be ridiculously out of place in this sombre working town of Lancashire.

PARIS EXHIBITION OF 1878—FRENCH OFFICIAL REPORT ON DRAWING.

In consequence of the insufficiency of the vote allotted by Parliament to our English Royal Commissioners, we are to have no official reports by our own countrymen upon the Universal Exhibition held at Paris last year. We are, therefore, compelled to rely upon foreigners for skilled technical reports upon the results of the Exhibition, and for estimations of the degree of progress or otherwise which was therein manifested, as contrasted with previous similar international gatherings. The reports presented by the French themselves are of the highest importance, but most European countries deputed experts in the various departments of industry, science, and art to proceed to Paris and to furnish official statements of their opinions, which have, many of them, appeared as Government papers.

Few of the reports which have hitherto been published present more points of interest than that prepared by M. A. Ottin, the Government inspector for instruction in drawing in the Paris communal schools. This report is dedicated to his chief, M. Gréard, the Inspector-General for Public Instruction in France. It is specially valuable to English readers, as affording the results of careful observations by one well able to form an opinion respecting the advantages and defects of the system pursued in the Government Schools of Art in this country, and as giving a brief but compendious statement of the various methods of art-teaching adopted throughout Europe. M. Ottin divides his essay into three sections—first, the teaching of drawing previous to the date of the Exhibition; second, a visit to the Exhibition of 1878; thirdly (conclusion), in what way should drawing form part of a general course of education, and how must we proceed in order to render such teaching more common?

The report opens with a *résumé* of the results of previous Exhibitions, and the author lays great stress upon the important influence for good upon our English manufactures which was exercised by the Manchester Art Treasures Exhibition. One of the consequences of this Exhibition, he tells us, was the establishment of the South Kensington Museum, the success of which induced Germany, Austria, Italy, and Belgium to found similar institutions; and, according to M. Ottin, the effect of these collections upon the taste of our designers was so remarkable that as far back as 1869 it was admitted in France that in many directions in which we were previously far behind them we had caught them up, and even in some instances surpassed them. It is a fact which cannot be disputed that the commercial statistics of France and other European countries prove that the export of art manufactures from France has, since 1869, been constantly decreasing, whereas the production of all the other countries in these categories is on the increase.

In his remarks upon the 1867 Exhibition M. Ottin states that here, for the first time, was collected a series of the works produced in the art schools of England, Belgium, Germany, and Austria. France could then show but little to compete with these useful institutions, which were at the same time nurseries for qualified teachers of elementary drawing and means for the education of the national taste. She possessed, says he, it was true, the Central Union for the Fine Arts Applied to Industry, a private society founded in order to give a new impulse to French taste, and to direct and encourage the efforts both of the artist and the manufacturer.

A brief description of the rise and progress of the Union Centrale follows:—The institution occupies an extensive site in the midst of the chief art industries of Paris, and consists of a public library and reading-room, and a museum; both are open gratuitously to the working classes, and place before them examples of the art manufactures of all times and all countries. A large hall is set aside for conferences, and biennial exhibitions are held, which consist mainly of loan collections contributed by the chief amateurs of France.

In 1869, on the occasion of the third of these exhibitions, an International Congress was convened, for the consideration of the teaching of drawing, to which representatives from nearly every country in Europe were delegated, and which yielded important results. Before proceeding further, M. Ottin describes the methods of instruction in drawing propounded by Gérard de Lairesse, published in Amsterdam, in 1719—Tischebein, of Berlin; Ramsauer, of Iverdon, and Boniface, at Paris, in 1823. Passing on to more modern systems, he analyses those of MM. Daix and Patroit, and the plan advocated by the brothers Dupuis. His own system, now in general use in the Paris communal schools, he modestly relegates to the appendix. Coming to the Vienna Exhibition of 1873, he quotes the report of the working-men delegates, who seem to have fallen foul of the almost universal badness of the drawing copies in use on the Continent. They say "the study of the geometrical principle in teaching is applied in all cases with more or less success, particularly in Germany; but nearly everywhere, in spite of the sensible and systematic elementary teaching, we find the pernicious system is prevalent of giving examples to be copied (principally to the advanced students), and these drawings, almost without exception, under the pretence of being simple, are very bad and abominable in point of taste."

M. Ottin next examines certain American systems, and gives some examples of those proposed by Marcius Wilson, of New York; Walter Smith, of Boston; and Frank Aborn, of Cleveland.

Returning to Parisian schools, he explains the methods of M. Lecoq and of M. Darchez, and concludes the first section of his subject with the following general observations:—

"This long list of official and other methods of teaching, though I have abridged it to the utmost, is the most certain indication of the inefficacy of all the systems. All the plans to which I have referred, as, in fact, all our routine courses of art teaching, show at a glance the desire to arrive at some means of rendering the teaching of drawing more general, but how is it proposed to attain this end? Up to the present time, with but few exceptions, drawing has been badly taught. It has, in fact, been attempted to begin from the wrong end, seeing that by the existing plan we only learn how to look at an object when we know how it is drawn. It is, nevertheless, indisputable that we should be doing a real service to all classes, even to those making art their vocation, if at the very commencement of their education, at the age when the child learns rapidly and retains for so long the facts we teach it, if it were possible by the study of what we may term a species of geometrical alphabet, easy to understand and to teach, and amusing in practice: if, in short, we could bestow on him that very necessary acquirement, the power of measuring rapidly and truthfully by the eye. In this respect we agree entirely with M. Buisson, the writer of the Art Report on the Vienna Exhibition, when he says—'Learning to draw is, in fact, learning to see and to form a true estimate of what we see. Before endeavouring to imitate it is necessary that the pupil should impress well upon his mind the nature of his model or copy, and that he should thoroughly understand what he wishes to reproduce. The arrangement of the chief lines, their true proportions and their mutual relations to one another constitute the leading characteristics of every object. To represent these is the first and most important task of the draughtsman.' All this is very true, and at the Philadelphia Exhibition M. Buisson was able to see that this was what many people were in search of; but in order to attain to this we need the means and the appliances for learning to see, and professors to practise these methods. Up till now the school machinery for instruction in drawing has absolutely no existence in France; and M. Buisson justly states on this point that 'even in the normal schools it is necessary that a more rigorous programme, a better choice of copies, and a regular course of rational study should be introduced in order to regulate with greater precision the teaching of the masters, and to guide in a better spirit the training of the pupils.' There is, unfortunately, but one remark to add to these judicious observations: that is, that it will not be sufficient merely to wish for good regulations and good masters, but we must afford the means of obtaining these advantages; they are both equally desirable, for we have not yet secured a methodical system. No such thing exists as a trained body of masters, and, in the absence of proper teaching, we remain for ever under the sway of those empiric doctrines which form our daily routine."

The second section, the visit to the Universal Exhibition of 1878, opens with England and the South Kensington Schools. M. Ottin appears to have been misled in certain material facts with regard to the National Art Training School. Thus, he says, that admission to the schools can only be obtained after an examination in drawing, which excludes beginners; and he states also, that a certain number of the pupils who desire to be trained as masters have to be examined in every group of subjects taught in the school. The truth being that the institution at South Kensington is a training-school for art masters, at which also a certain number of students are taught drawing on payment of fees. He gives the outline of the course of study correctly, and praises the way in which designing for manufacturers is systematically taught. He finds fault with the length of time devoted to outlining from copies and from the cast, and with the mechanical perfection of the shading in chalk. In these works, he says, "the object appears to be to rival, in rigorous exactness, the photograph, though the result is tame, cold, and lifeless." When he criticises the paintings, he says, "the heads painted from nature are much better, but one sees in them traces of labour: this is the general defect of the English school. A precious defect, it is true, because it is a sign of conscientiousness and love of truth. It is the knowledge of what is really true that they have still to acquire, more especially in sculpture." Speaking of our English fine arts, M. Ottin says, "The copy of detail only requires patience; Art has quite another vocation: it seizes instantaneously on an impression; it preserves it; and by the simplicity—which is often very apparent—of its rendering, conveys to the spectator this original impression, and leads him to supply all the detail which has been, one may almost say, skilfully neglected, but the omission of which never gives us any cause for regret."

With respect to English industrial exhibits at Paris, we read as follows:—"The Exhibition of English Art Manufactures furnishes important evidence of the influence for good which has been exercised by the valuable museum at South Kensington. In cabinet-making, jewellery, pottery, and certain textile fabrics for furniture, we see signs of immense progress since the last Exhibitions at Paris and Vienna. In furniture, above all things, the English still remain English, and they are quite right. In other things, as, for instance, in jewellery, and especially in pottery, one sees too often the influence, and sometimes the actual handiwork, of French artists and craftsmen." M. Ottin concludes by lamenting the entire absence from the English section of all examples of elementary teaching in drawing, and tells us he failed, after due inquiry, to obtain any information upon the subject.

The works done in the public schools of Austria, Hungary, Belgium, Holland, Switzerland, Italy, Spain and Portugal, Russia, Canada, the United States of America, and Japan, are in turn examined and commented upon in this report; and a lengthy exposition of the work done in France and her colonies completes the second section. From the conclusion, forming Section III. space only remains to us for a very short extract, which is from the *résumé* of the report, and conveys the gist of M. Ottin's observations.

"By the simplest of means we can acquire a power of accurate observation, we can render our hand skilful, and we can exercise our perceptive faculties. Let us, then, teach our children how to see and to observe; and since we are Frenchmen, and desire to remain truly French, both in our drawing and in our feelings, let us give them a faculty which shall lead them, if not to art itself, at least to the appreciation thereof, by the culture of their individual tastes, intelligently trained and directed by their own efforts. Let us point out to them the eternal source of the beautiful: the *truthful*. Let us ever seek our inspiration from nature, and endeavour to translate her by our own means and powers, and for our own satisfaction and delight. To do this we may find it necessary, in some cases, to engraft this absolute truth in nature upon the works of the past; but in every case, let us ever remember that, as M. Viollet-le-Duc so well says, 'These works arise out of needs and wants of a community which constantly moulds and transforms itself. Never let us endeavour to imitate this thing or that thing, but let us avail ourselves of the materials which surround us, of the natural objects which are ever at our disposal, and we shall then have an art of our own, and of our own time. Let us work as the men worked who have gone before us; let us study not to imitate them, but to attain to the same results as they achieved; let us do *as* they did, but not do *what* they did.'"

THE NATIONAL COMPETITION PRIZE DRAWINGS.

[SECOND NOTICE.]

ONE of the principal advantages to be derived from an annual exhibition of the leading works of our schools of Art, is that it affords not only an excellent test of the progress of Art culture in the country, but it also enables us to judge of the comparative value of the different branches of Art education, and the influences of certain industries and modes of teaching. To begin with the study of the antique, we cannot overlook, for instance, the manifestation of distinct individualities in the drawing of such academic models of sculpture as the Apollo Belvidere, the Venus de Medicis, the Laocoön, or the Discobolus. Even all the restraints of official instruction do not prevent the student from showing his own interpretation and mode of execution. This year the capitals of Scotland and Ireland bear away the palm in drawing from the antique, and we can almost trace the influence of the two centres of teaching. The gold medal has been awarded to Jas. Catenhead, Edinburgh, for a half-draped figure, apparently a Venus. The drawing is vigorous though graceful, and the figure well-proportioned. N. Hill, of Dublin, carries away the silver medal for a drawing less refined, but displaying good outline and foreshortening; the same prize being taken by F. H. Herrington, of St. Martin's, Castle-street, for the same figure but back view, and by Mary H. Surenne, of Edinburgh, for some cleverly executed drawings from busts. Among the bronze medal drawings is one of the Discobolus by Lily Schell (Brighton) as a drawing of considerable merit and truthfulness in the limbs, and both the ladies last mentioned have distinguished themselves in other departments. Silver medals are also awarded to Walter H. Roe, of South Kensington, and to Mary Hope, of Edinburgh, for a broad and skilful figure drawing. J. Speirs and J. M. Gray, of the latter city, obtain bronze medals. The group of Wrestlers, by C. J. Adams, Leicester, is certainly creditable; while E. Gibson, of Bloomsbury, is well deserving of the book prize he has won for his Laocoön, though we think the drawing of M. L. Menpes is better. Honorary awards are given to W. P. Watson, G. Hare Cartlidge, and Sophia Broad, for drawings from the antique.

Figure-drawing from life makes a large feature in this year's exhibition. Stanley Berkeley, of the Lambeth School, wins the gold medal, for a standing figure, and Edith Savill, of Lambeth, the silver medal, for a drawing of a girl. W. Davis, of St. Martin's, and Emma Osman, South Kensington, are also recipients of silver medals, for carefully-drawn figures. Much might be said in favour of life models, and against academic ideals of the human figure. The former, no doubt, is favourable to the development of invention and freedom, and no artist can become a master of the figure without the training the living model affords. It has been urged, on the other hand, with considerable truth, that the Greek ideal tends rather to stifle originality, and to make the student a copyist, and unable to produce works of art. Plato and Winckelmann are said to have been set up as supreme, and their ideals of the beautiful to be accepted without question. Yet all that can be said against the system amounts to this: that ideal art copyism makes more imitators than original artists—a defect certainly, but one attributable mainly to the system of teaching inculcated, which denies to the student all personality by never allowing him any means of studying the figure which the ancient Greeks possessed. The proper corrective is undoubtedly to be found in modelling from life, and in compositions of a decorative character. The task of simply copying a figure, while it may teach the student proportion and outline, does not give him that knowledge of actual *expression* and *movement*, which was the motive of Greek art. What we deplore is that no attempt has yet been made to introduce modern life in our art.

Turning to the studies in oil, we find some very creditable works. These mainly represent still-life subjects, in which grouping, drawing, and colour are developed. Mr. C. M. Wood, of Bloomsbury, takes the gold medal this year. The subject is a jar and flowers, skilfully grouped with accessories, that do not destroy the unity of the composition. The reflection of the vase in the mirror, the rich bronze yellow background, and the blue Doulton ware, are admirably painted with much breadth and delicacy of feeling and colour. The group by W. Mills, of Birmingham, which obtains a silver medal, is another skilfully composed subject, including earthenware pottery, a bronze plate, and a nautilus shell. The drawing and modelling are careful, and the harmony of colour in the yellow and blue jars, and the reflected light, clever. The violin and group of music-books, by W. M. Spittle, Birmingham (silver medal), is truthful. Birmingham carries another prize (bronze), awarded to Claude Pratt, for a group of jars and books, which, to our minds, is more creditable than the group awarded a silver medal, the subject being a metal jug and earthenware. Mary West, of London, well deserves the silver medal for her group, composed of a ham, a loaf, and cheese, in which the chiaroscuro is excellent, and the colouring mellow and broadly treated. We notice also studies by J. F. Walker (Birmingham) of vases, box, &c., relieved by a green curtain; by T. Alison (Edinburgh) and Annie Hastling (Manchester) excellent groups of birds and cabbage. The last lady's study of lobsters is also masterly in drawing and colour, and we must congratulate her broad handling. Her flowers and onions are also faithful. Other cleverly executed studies in oil are noticeable, but in some of them the effect is painfully lost in crowded accessories; and in others, by defective composition in outline and colour. We must not overlook one or two highly-finished studies by students of South Kensington. Walter Wallis's composition, a carved chair with a bronze cup, and a rich background of Turkey rug, deserves its reward—the gold medal, and we also note a similar group by George Trobridge. In the water-colour studies we find the highest prize is a silver medal, won by Mary H. Surenne, Edinburgh, for a soft, skilfully-manipulated, and quietly composed group of pitchers and oil utensils. The objects are very artistically disposed; there are no unnecessary adjuncts, nothing to distract the eye, and the drawing, modelling, and shading are perfect. Surely a gold medal might have been bestowed, as the work is one that far surpasses in artistic execution many other subjects for which silver medals have been awarded. We cannot conceive, also, how so clever a drawing as a group of musical instruments, cup with asters, and chest, by J. Kelly (Southampton), could have been valued so low as to receive a book prize; its chief fault is the crowding of the objects. Another clever composition, a shell and jar, with rich background, takes another book prize. The dish of fruit by F. Harris (Lincoln) is feelingly rendered, and is worth a silver instead of a bronze medal. We may mention, also, a clever study of open books, &c., by Jessie Douglas, of Belfast, and other skilfully-coloured subjects by Moore, Barber, James, Wilkinson, F. Morley, W. Ferguson, Lovell.

A few admirable studies of heads in oil and water-colour are to be seen. W. J. Boyd, Birmingham, gets a silver medal for a head of a negro well expressed; and that of a girl by F. Sugars, Manchester, in water-colour is skilfully drawn. We remark also that the crayon studies are numerous; Mr. W. Alexander, Salisbury, obtains a medal for an excellent drawing of a Sister of Mercy; and Nelly Ericksen, Lambeth, a bronze for a head of a man.

Among the drawings of bronzes and enamels we must notice J. Clark's studies of Egyptian, Greek, Roman, Romanesque, German, and Italian specimens, all drawn and coloured with much power and feeling. They receive a gold medal; the silver one being awarded to W. P. Watson for illustrations of enamels. Mr. G. W. Rhead takes a gold medal for a design for a vase with figure subjects delicately drawn in sepia, but we are unable to admire the outline. The author's frieze for a wine fountain is a clever Bacchanalian group. We do not admire the very commonplace vase which obtains a bronze; it has no base. The few other works we observe in this class are scarcely equal to former efforts. Drawings in sepia from the east are always a large feature in these exhibitions. This year G. H. Elliott, Bradford, obtains a silver medal for a frieze of Byzantine design with foliage and birds entwined. The drawing is distinguished for spirited execution and careful shading. W. H. Banks, Rotherham, wins another for a Roman frieze in which the foliage is well drawn and modelled; and Alice Perry a bronze for a French capital. A bronze is also obtained by J. Craven, Portsmouth, for ornament; and a book prize by J. H. Guild, Edinburgh, for a Classic cornice with lion's head. We observe one or two well-drawn copies of spandrel and frieze ornament. In addition to the works of a decorative kind noticed in our last, we may mention a few other designs sent in for the Owen Jones' prizes. For instance, J. A. Stamp has a clever sepia drawing for a dining-room buffet, but it lacks gradation of parts, and the top is very heavy.* M. Haye's (Limerick) design for a vestibule ceiling is quiet in colour, and the design is far better than the prize design we noticed last week. The same student's decoration for dining-room wall is much too red. Other works show labour, but a need of refinement and knowledge of detail. We must also mention some cleverly-drawn designs for screens, with painted canvas panels excellent in colour and outline, by J. Harsman and T. Meldrum; and door-panels by Riley.

The studies of ornament, from Classical and Mediæval examples, are, as usual, numerous, and show that ornamental design enlists a large number of art students. In the present instance the prizes do not appear to have been given with much discretion. The book prize, given for copies of the Five Orders, might have gone elsewhere, and the copies of ornament in Decorated Gothic are really very poor, and do not deserve a prize. To the designs for architectural subjects we mentioned last week we may just add Mr. R. A. Willis's "Country Residence," Italian in style, shown by carefully-coloured drawings, but the plan is ill-lighted in the passages; also a design for a school of art, by Harry Gill, shown in an elaborate set of sections, &c.* We again express a hope that architecture, at least, may be studied in future with some regard to the capacities of students.

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THE ARCHÆOLOGICAL CONGRESS AT YARMOUTH.

[FROM OUR OWN REPORTER.]

THE British Archæological Association, which met, it will be remembered, last year at Wisbech, on the north-west border of Norfolk, are now assembled for the thirty-sixth annual congress at the opposite angle of the county. During the present week the headquarters are at Yarmouth, and on Monday they will be removed to Norwich, in which city the proceedings will close on Wednesday next. The present is the third congress held at long intervals by the Association in East Anglia, the previous centres having been Norwich and Ipswich.

Isolated as this district has ever been from the rest of England by the Wash, the fens, and the river Stour, East Anglia possesses a character and an interest of its own to archæologists. Although now sparsely populated, in the Middle Ages it was the centre of the woollen manufacture in England, and its ports and estuaries, shallow at the best of times, but not then filled up, afforded scope for a prosperous trade to be carried on by the small vessels then used. The small size of the "hundreds" and the great number of churches in the counties of Norfolk and Suffolk, testify to the relative largeness of the population in the pre-Norman period, while in every decayed market town and chief village are seen the large church of Late character, with broad, square west tower (frequently still unfinished), flushed flint and stone panel work, open hammer-beam roofs, and well carved screens and parcloses. Every feature grand in proportion, but often rough and weak in execution—tells of increased prosperity and ostentatious display of wealth at the close of the fourteenth and during the fifteenth centuries. A singular fashion of the 11th and 12th centuries, apparently resulting from the necessities of building with flints, is the round tower so common as a feature of ecclesiastical architecture in the Waveney district. The neighbourhood now being visited contains many examples of both the local varieties of church (the Late Norman and highly developed Decorated), several conventual establishments, and a few military remains.

Although it may be suspected that some of the popularity of the present Congress is due to its being held at a seaside resort, yet Yarmouth has much in itself worthy of study by the historical and architectural student. Roman remains are abundant within a few miles both north and west, but the traces of the work of former days within the borough, with the exception of part of the great parish church, go no further back than the 13th century. To that period belong the encircling walls, which, together with its peculiar situation on a sandy peninsula, shut in by sea and rivers, have cramped it into the gridiron; to the same time may be ascribed the foundations of the great monastic establishments, Benedictine on the north, Franciscan in the centre, Dominican at the south, and Augustinian across the Yare, with a cell in the middle of the town, which once overshadowed the latter, and the scattered and fragmentary remains of which afford abundant material for study of detail to those who will search them out, in narrow and ill-ventilated passages and still more confined houses and courts. There are some quaint examples of domestic work in wood and plaster, of Jacobean date, here and there amongst the beetle-browed, small-tiled, sagging-roofed houses. A local type of iron-tie in the shaky walls of old tenements, with three reversed scrolls on either side of a central I-shaped stay, is at once vigorous in appearance and effective in preventing further bulging. But we must proceed to a journal of the Congress.

MONDAY.

The meetings were opened by a public reception in the council chamber, Town Hall, a Classic building, soon to be replaced by a larger and more commodious edifice.*

The Mayor (Mr. H. E. Combe) briefly welcomed the Association to Yarmouth, in the name of the inhabitants, and introduced to the members the President for the year, Lord Waveney, who at once took the chair and delivered the

INAUGURAL ADDRESS.

The tendency of this age, his lordship remarked, was in two directions—one by which they were being carried forward with accelerated pace, by the mighty powers and manifestations of nature—steam, electricity; the other that in which archæology found its principal object and scope. While these motive forces were being utilised to the utmost, thoughtful minds were also tracing back, step by step, the progress of our race from the earliest recorded times. In this fortunate age the analytic and the synthetic elements mutually assisted each other, each having their special sphere. Most of the applied sciences tended in a remarkable degree to help to trace out the various steps by which we have arrived at our present point of knowledge. The successive discoveries of geology, critical philology, and comparative anatomy, had lent their acute discrimination and searching glance in that direction, till they arrived at that mysterious barrier, where they learned nothing further of man, save that he existed to be developed for the beneficent purpose for which he was created. Beyond the worlds of space which encircled the globe they knew nothing certain. A great speculative philosopher had endeavoured to trace back the origin and accretion of man to a faint speck of light in the distant and prehistoric past, but to him it seemed that they must exercise a wise and thoughtful humility in pursuing such inquiries to the bounds of physical science, and the indications and inferences permitted by it, and there they must pause, and humbly wait and hope for knowledge in another state of existence. Archæological knowledge might be divided into two sorts—the positive, which might be traced step by step by the touch of the hand; and the comparative, which must be mainly founded upon inference, guided by a power of assimilating likelihoods, even where likenesses could not be followed—and inferring from thence what could not be seen. The greatest discovery in astronomy made in our own times was by the persevering use of the comparative faculty, by which, arguing from certain perturbations of the planetary system, an English and a French observer simultaneously arrived at conclusions by which the vast planet Neptune swept into our ken. Some of the greatest rewards of inferential archæology were in the discovery, on the wild wastes of the Roman Campagna, of the sites of cities and villages coeval with the foundations of ancient Rome; in ascertaining that upon the Hampshire downs there yet existed undisturbed the foundations of forgotten villas of the Roman colonists; of tracing around a railway station the vallum and rampart, within which the Roman legions dwelt during their occupation of the land of the Iceni; of finding in the neighbourhood of an old presbytery of the Templar Knights of St. John, the tilt-yard in which they carried on their jousts and games. It had been an object of inquiry for many years among Roman antiquaries where was the site of the once famous city of Politorium, destroyed in the second century, A.U.C. Its general position was known, and it was also on record that it had been absorbed in one of the great estates of the Roman patricians in the Campagna, by which so many antiquaries have been confused. The search was especially confided to him (Lord Waveney), and for three days, at a distance of ten or twelve miles from Rome, he pursued his task with confidence but without success, until, on the evening of the third, when, as he mounted his horse, he turned towards the setting sun and looked once more on the broad Campagna. By the aid of the sinking orb he saw distinctly drawn out on the western horizon the whole plan of the city—its ditches, bridges, and ramparts. In geodesic science it was an axiom that where the hand of man had once been, the mark was never effaced; where man placed the stamp of his imperial signet, the writing and record would remain as long as time to bear witness to the fact. At the angles of some fields on the downs at the borders of Hampshire and Berkshire, might be seen at this day elevated right angles and parallelograms of more or less accuracy. These represent the substructures of old Roman villas, destroyed in some inroad of the natives or invaders, or abandoned to decay. Wherever such right-angled elevations existed he believed excavations would bring to light traces of the Roman occupation, and it was to be hoped that this suggestion would afford during the present Congress some clues to work executed by that mighty conquering and colonising nation, of which the very existence had been totally forgotten for ages. It sometimes required what he might call a very fanaticism of inferential appropriation to be certain that one was on Roman ground. Those who might return to London by the Cambridge line would perhaps notice on the up-side of the railway station at Chesterford—a name in itself suggestive of a fortified thoroughfare—the valla and angles of the *castra* that defended the *ford*, and so gave a name to the place. To come to a more recent work, he might say that when looking over the presbytery of the Templars at Hitchin, in Herts, some time ago, he was convinced that in an elliptic inclosure he had identified the tilting-yard of the Mediæval knights, and that a hedge had taken the place of the barrier. He congratulated the Association on coming to a district of so varied a character, in which at one time land and sea had been so blended that there was great opportunity for exercising the discriminating skill of which he had spoken—a district known to the commerce of Europe when the greater part of England languished in an undeveloped state—a district through which military roads, the blessed highways of commerce, and the consecrated paths of pilgrimages had passed in every direction almost before their history was formulated into shape—a district in which the sea had worked its ravages, carrying away, even in our time, rood after rood of the solid land, leaving bare cliffs where had stood great centres of commerce. Over the ruins of one of these (Dunwich) they would pass in the course of their expedition. Anciently, as a writer in the *Edinburgh Review* had pointed out, a larger relative amount of power belonged to Norfolk than even its size and positition and its present position warranted. The commerce with the Belgian and the Dutchman was at first but solely an interchange of hard blows in warfare—a plausible theory which attributed the stockading and moating of a large number of Suffolk houses on the coastline to the desire to protect the inhabitants from the predatory incursions of the Norsemen up the estuaries now filled up by the sea and converted into tillage land. The houses continued to be stockaded and moated during the Middle Ages, following the traditions and examples of Saxon times. Did they wish to know what succeeded to that time? There was the great city of Dunwich Framlingham the great town of the staple manufacture, that of woollen goods; and Yarmouth, with a merchant navy that was paramount on the seas, and in the bad communications by road of the Middle Ages was, paradoxically enough, nearer to the Continent than Norwich. Then there were the pilgrimages to Walsingham and South Elmham, and athwart the interior, all commencing with the shores, but all passing inwards to carry with them the blessed influences of civilisation. In the first instance they were traced out by these Burgundian pioneers of Christianity who had left marks of their presence through the land. The mighty empire of Rome was a power which stood apart from all other in the ancient world; so vast and peculiar were its operations, so resistless in its efforts as to be almost independent of chronology. Go where they might traces of this great people were to be found, and he believed if search were made Roman stations would be found in many places now unsuspected. Thus the church of St. Lawrence, Ilketshall, appeared to stand within the walls of a Roman camp, and the late Sir John Boileau discovered similar places just north-east of Wymondham. He was of opinion that such posts were placed throughout the land of the Iceni, within trumpet-call, for the purpose of rousing the soldiers to resist outbursts of the Iceni. In a similar manner the citizens of the United States defended against the Indians the communications with California. In conclusion the President referred in terms of admiration to the Norwich school of painters who had been educated unknown to London, and scarcely recognised by the inhabitants of East Anglia, and referred to two volumes of etchings of the Norfolk churches placed at the disposal of members during the congress by Mr. F. Danby Palmer. He also alluded to the efforts being made by the Society for the Protection of Ancient Buildings to point out the faults in restorations in progress, and suggested that they might perhaps be the means of preventing some ugly additions, and of saving them from the loss of many picturesque features of their churches.

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* We give this week an illustration of the design for a church for which this gentleman was awarded the gold medal last year.

* In noticing the designs for ironwork last week we omitted to say that G. W. Pridmore's design received a third grade prize. We also find that E. H. Perkin has been awarded a silver medal for a drawing of screen in St. Paul's Cathedral, not a bronze one as stated.

* The accepted design, by Mr. J. B. Pearce, of Norwich, was illustrated in the BUILDING NEWS, Sept. 27th, 1878, and many of the other principal designs submitted in competition in the same half-year.

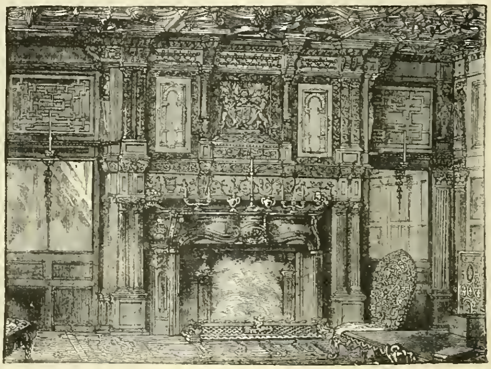
The customary vote of thanks was passed, on the motion of Mr. Thomas Morgan, treasurer of the Association, seconded by Mr. Charles Diver, ex-mayor.

The Rev. J. J. Raven, D.D., head master of the grammar school, indicated on a large map, clearly marked in broad black and red lines and blots, the route that he proposed to follow in his walk through the town; and Mr. George Wright, hon. Congress secretary, sketched in well-chosen and humourous terms the programme to be followed during the ten days' congress. A

PERAMBULATION OF YARMOUTH

was then made under the guidance of Dr. Raven, the first building visited after leaving the town hall being the *mansion* of the *Carters* on the South Quay, now occupied by Mr. S. Aldred. The house was built by Benjamin Cowper about 1596, a public-spirited townsman, who exerted himself in obtaining letters patent for a collection throughout the kingdom towards the maintenance of Yarmouth Harbour in 1635. Cowper sold the house to John Carter, bailiff, in 1641, who on the 9th July, 1642, read the conflicting proclamations of the King and Parliament to the Corporation. They resolved to obey the latter, and in this house of Carter's, it is said, the execution of Charles I. was determined upon, on the authority of Hewling Luson, a well-known merchant and local historian of the last century, who was told by Nathaniel Carter, who was 14 years old in 1649. The exterior of the mansion is modern, but on the first floor, approached by a spacious staircase, is the fine apartment of which we give (by permission of Mr. Bogue, the publisher of Walford's "Pleasant Days in Pleasant Places," recently reviewed in these columns) an illustration. As restored by the late C. J. Palmer, the author of the "Perlustrations of Yarmouth," the room affords a fine example of the earliest Jacobean work. It is well proportioned, in the ratio of five in length to three in width, and lofty for a room of the period; the walls are entirely of oak wainscoting, divided into panels of very low relief by moulded uprights and rails, with carvings of ships and fruit at intervals. The ceiling is of plaster formed into interwoven panels, with small pendants arranged in groups of four, and conventional fruit within the cabled outlines. The projecting parts are picked out in white on a yellow ground. The mantelpiece is of equally rich and heavy character, the furniture placed in it is of like type, and the only glaringly modern feature in the apartment is some stained glass lights, which render it still more dark than it would otherwise be.

A number of remains of the *Franciscan Priory*, founded, it was known, between 1271 and 1296, in Queen and Middlegate-streets, were next inspected. In some wine-vaults entered from the former street were seen the bases of a *cloister* walk running north and south, at what was then the level of the town; it consists of some four or five pairs of triplets of narrow clustered shafts, with fine neck mouldings of good Early English type, set in pairs at 10ft. span. Another series of explorations of shops, courtyards, and of a house in a narrow "row"—where an elderly dame left her lonely tea-table, disconcerted by the large party of visitors peering through the window and doorway—revealed the superstructures of four bays of these buildings, with acutely groined vaults, in which all the ribs and most of the bosses are perfect, although half obliterated by whitewash. Most of the latter stones are treated with figure subjects, and appeared somewhat later in character than the bases in the cellars beneath. General admiration was expressed at the beauty of this groining, and Dr. Raven remarked that the existence of the remains of this priory was almost unknown in the town until very recently. In Middlegate-street the remains of the *Hall of St. George's Guild* were seen. By a certificate dated 1388 it is known that at that time the brothers and sisters of the Guild used to meet in St. Nicholas Church on the Feast of St. George, and after voting grants for a chaplain, &c., dined at an inn. At a later date they seemed to have found funds from which to build a hall for themselves, and the scanty fragments agree with the supposition. There is, in a room off the street, a wide doorway of Early Perpendicular character, with nine members to the somewhat deep mouldings on either side of the arch, above which is a square hood. In the spandrels on the interior are shields—that on the left being the Cross of St. George, and that on the right a merchant's mark. The hall has been cut up into rooms, but traces of the masonry and buttresses are apparent, and quiet and solitary research would probably reveal in the houses behind the outline of plan of the hall. Further southwards, in Middlegate-street, more remains of the *Franciscan priory buildings* were seen in a warehouse, consisting of two pairs of piscinæ, each trefoil-headed, in a south wall, and in rooms above what appeared like three Early English dormitory lights. In a clothier's warehouses on the same side of the street (east) were seen a series of very interesting remains, imitating in oak the mouldings of 14th century masonry; these included three blind arcades, and in another room a flying arch and beams,



CHIEF ROOM IN CARTER'S MANSION, ON THE SOUTH QUAY, YARMOUTH.

the latter treated with two rolls separated by a fillet and stop-chamfered. The ancient Tolhouse in this street is to be visited on Saturday. A few remains of the *Dominican priory*, which formerly occupied a large space on the southern portion of the town, were seen, consisting of the inner and outer pointed arches of a small entrance, also in a room in Middlegate-street. Dr. Raven mentioned that the Dominicans settled at le Stronde, or the Strand, in Yarmouth, in 1271, just 50 years after their establishment in this country; the Franciscans followed within ten years, and it was interesting to note the difference in style exhibited by the remains of both. The latter, of which there were far the most remains in the town, were marked by grace and elegance; the former by rugged solidity and sternness of workmanship. On the site of South Gate Dr. Raven exhibited on a pole a restored drawing of that structure as it appeared prior to demolition. It consisted of two massive round towers, pierced for foot passengers, with a deep arch thrown across the road, carrying a chamber above. On the west side a boom could be projected over the river, so as to close access to the harbour. From this point the members returned, following on the outside the course of the *Town Walls*. The license to build these was granted in the year 1284, and the work of erection appears to have been carried forward during a little over a century. They are still very complete, consisting of rubble, faced with cut flints and small red bricks, the last materials more abundant in the patchings and repairs near the top; the walls were from 12ft. to 20ft. high, and of considerable thickness, and were furnished with a pointed coping at top. In one or two places the arrow-piercings in single stones at regular intervals are still perfect. Most of the sixteen towers by which it was protected still remain, many of them pretty complete. At the south-east angle of the walls are two circular ones of flint, with panelling formed by single bricks set stretcherwise on the upper stage of one. Near St. George's place Dr. Raven pointed out remains of the *New Mount*. At this point the wall makes a feeble return, and at the time of the Spanish Armada scare, in 1580-1, Sir Thomas Leighton built this mount with the materials of the charnel house, on which the townspeople worked with a will, even the grammar-schoolboys aiding. At this time the conical roofs of small tiles, which give so characteristic an air to the towers of Yarmouth, were added. At Dr. C. C. Aldrich's, leisure was given to more closely examine the wall and one of these towers by tea and coffee offered on the lawn, and the traces of the post-Reformation private oratory of Sir Richard Bedingfield's family—having wide arches and a domical light at east end—were inspected. Most of the stained glass, which represented Saints' heads, was removed by the present owner a few years since. At the north end of the Market Place, next the churchyard of St. Nicholas, a halt was made on the site of St. Mary's Hospital, of which only the inclosing walls remain; within is a charity-school of the last century. This hospital was founded by Thomas Falstolfe, in the 13th century, and in 1278 William de Gerlingge gave an annual rent for the maintenance of two priests. In 1398 Richard II. granted it to the bailiffs of Yarmouth, and in 1419 a 40 days' indulgence was granted by John Fordham, Bishop of Ely, to all who aided in its repair. In 1551 the chapel was despoiled, and its revenues diverted to a grammar school, which went on with fluctuating success till 1757, when the corporation stopped the allowance to Dr. Francis Turner, the head-master. In 1863 the grammar school was revived on a fresh site, and in 1872 the new school premises* near the Denes, were opened by the Prince of Wales. The visitors then proceeded to the site of the North Gate, of which a copy of a drawing made in 1806 was shown; it had two square towers, and above the central arch on the Caister or outward face, was represented arcading and panelling of Decorated character. Passing down Rampart Row, on the inner side of the north wall, the last towers near the quay of the Bure was seen; both are irregular polygons, with the usual conical-tiled roof. Mr. E. P. Loftus Brock remarked upon the very early use of brick shown in the town wall, and said other neighbouring examples were at St. Olave's, about 1290, and at Flixton-next-Blundeston. Replying to a question, he said herring-boneing was no indication of antiquity; the fashion had never died out. At Fuller's Hill Dr. Raven remarked that they had now come back to one of the two wide thoroughfares which, in mediæval days, connected the five wide streets running longitudinally through Yarmouth. As they had seen during the perambulation, access between the river and the sea was afforded at short intervals by over 150 narrow lanes or "rows." Another cross street midway between the old ones was opened nearly 70 years ago as Regent-street. A discussion took place as to the origin of these rows, Mr. Aldred suggesting that it was caused by the custom of dividing land into narrow strips between the streets, and that each set of people built to nearly the edge of their land, leaving mere passages beyond. Mr. Loftus Brock differed from this, contending that it was simply the result of an endeavour to build within the cramped lines of the town walls, and instanced the parallel case of the "Closes" at Carlisle, and other lanes in walled cities. The last place visited was the cell of the Austin Friars, in Charlotte-street, which was, by a curious irony of fate, a meeting-house of the Society of Friends. The only visible remains of the old work are buttresses within the courtyard, and a moulded entrance to the basement of the street-front, closed from sight by shutters. Within, bare deal benches, bare washed walls and ceiling, and sash-windows presented as cold a prospect to archæologists as could be desired. Before departing a cordial vote of thanks was passed to Dr. Raven for his courteous and well-planned guidance.

THE DINNER

took place in the evening at the Star Hotel, Lord Waveney in the chair, and about 120 ladies and gentlemen were present. The Rev. G. Venables, Vicar of Yarmouth, in responding to the toast of "the Clergy," said that he hoped that when the members had examined the magnificent parish church, those concerned with its restoration would learn something which would be useful in carrying forward the work. That undertaking, commenced many years ago, was far from complete, and he hoped yet to see the western tower erected with a lofty spire upon it. Many years ago it was said, and regarded as a witty remark, "Why should I do anything for posterity? I should like to know what posterity has done for me?" It appeared to him that posterity had done and would do a great deal for them, for past architecture and that of the future would ultimately weld together a golden chain to encircle the earth with great and magnificent results. They went to the past to learn experience, and looked to the future in which they might outlay the results of those experiences. If they could improve on the past in new building—say, for churches—by all means adopt the improvements, but until then stick fast to the archæological prescriptions which would secure fine architecture and magnificent results. He also referred to the Society for the Protection of Ancient Buildings, saying that the members had done themselves incredible mischief by the extremes to which they had gone. The toast of the Association was proposed by the Mayor of Yarmouth and responded to by Lord Waveney.

TUESDAY.

The excursion commenced on this day under the brilliant augury of an August sun by a long drive northwards—to the Roman camp and mediæval castle at Caister, the Late churches of Filby and Ludham, and the scanty remains of the Abbey of St. Benet-at-Holm

CAISTER.

Here a series of excavations on the west side of the church and rectory towers were inspected. The Rev. Dr. Raven explained that having heard through the Rev Mr. Marvell's gardener that he had dug upon pavement in the garden, he or his sons, in company with the rector, opened the ground in several places about two months since, and at a foot below the surface they came everywhere upon masses of rubble foundations, about 3in. thick, beneath which was the virgin sand. Near by they found an ashpit containing some coins and a good deal of pottery, on some of which was a representation of a duck. Mr. Raven added that many Roman remains had been found here, and it was controverted whether Caister or Burgh, on the west of Yarmouth, was the Roman station of Gariaonum. The weight of evidence, and especially the remains, was in favour of the latter place, but he suggested that Caister was first founded, and that Burgh was subsequently fortified, the camp here being used as a summer residence. Of the Caister camp but slight vestiges of the inclosing walls remained. Dr. Raven read a paper written by Mr. John Gunn, of Norwich, descriptive of a Roman pottery kiln found in a sandpit on a farm to the south of the church in 1851. Mr. Gunn's attention was called to the kiln by the late Mr. Panchen, carpenter, a most assiduous and successful collector of antiquities. It was laid bare on the falling down of the sides of the pit, and consequently various sections of it were exposed from time to time. It was of clay, roughly worked by hand, and two ledges of the same material, which composed an outer casing of it, were exposed; on these were still standing two blue coloured urns. The kiln consisted of red and white and light-coloured clay (of which specimens were shown). One exhibited a finger-mark, proving that the whole work was done by hand. The whole kiln fell in two days after being discovered. Amongst the remains afterwards found were many contorted urns, and an iron stand on which the pottery had stood during baking. In the same field an abundance of Roman remains, pottery, and coins, and a vault have been found. Mr. Gunn added that a similar discovery of a Roman kiln was made at Sibston, near Caistor, North Hants, the ancient Durobrivæ. Mr. Loftus Brock said he had investigated for the association a similar kiln at Colchester, to which attention was called by Mr. Geo. Josselyn. It was very interesting to note the great dissimilarity of the ware made at the various kilns opened by the Romans. The members then examined a large collection of the finds displayed on a table in front of the rectory. Amongst these was a bone implement. Mr. Brock called attention to this, saying that it settled a moot point as to the date of such weapons. Here was a large bone, rudely fashioned into a spearhead, with a groove on the side where it was tied to the wooden shaft Such implements had always been supposed to be of a period long anterior to the Roman occupation, but this discovery, in conjunction with coins and pottery, showed that at least it was used by the native auxiliaries. The coins, Mr. Henfrey said, were of the reigns of Pertinax, Gallienus, Constantine the Great, and Constantius, ranging from the second to the fifth century A.D.

CAISTER CASTLE,

the next place visited, was one of great picturesqueness. Within a still perfect moat, and surrounded by fine trees, are ranges of red brick walling running south and west, now grass-grown and grey with lichens; at the right angle formed by their junction is a lofty circular tower, with an octagonal turret rising above it. At the eastern extremity of the site are low domestic buildings. All are in ruin, but the progress of decay is now arrested as far as possible by the present proprietor, Mr. John Gurney. In the west wall is a range of seven mullioned windows partially bricked up, which appear to have lighted the great hall, and at the south-west angle between the tower is an oriel recess with Flamboyant tracery: these details of fenestration are of stone, but the rest of the structure, including the boldly corbelled machicolations, are of red brick, once plastered on the inner side of the quadrangle. All are in ruin, but the progress of decay has been arrested as far as possible by the present proprietor, Mr. John Gurney. Within the precincts Dr. Raven read an historical paper, written by Miss Hatton, on the changes that have taken place in the ownership of the castle. It owes its origin to Sir John Fastolfe, a native of Caister, and one of the most successful soldiers in the French wars of Henry V., from which monarch he obtained a license to fortify his residence on account of the troubled state of the country. The castle was in progress in 1143, two years later was sufficiently finished for Sir John to enter upon possession, and he died there, aged 82, in 1459. By will he made Sir John Paston, his intimate friend, one of his eight executors, and desired that the revenues of his estate should be devoted to the support of a college for seven poor religious men and seven poor folk. Many claimants arose to the property, among them Thomas Mowbray, the last duke but one of the family, who said Fastolfe had left it to him; but the claim was disproved, and eighteen months after the duke's death, in 1461, the castle was restored to Sir John Paston by Henry VI. Paston agreed to found a college at Cambridge, but died before that could be begun, and the executors having proposed to sell it to the new Duke of Norfolk, the duke acted as if the purchase were complete and besieged the castle with 3,000 men. After a few months' siege the little garrison yielded, after the loss of one prisoner. The Pastons eventually recovered the castle, and it remained in their possession till the reign of Charles II. The celebrated Paston letters were written to and from Caister and Paston, near Mundesley, by members of the family. Mr. Morgan having vindicated the memory of Sir John Fastolfe from the slurs cast upon it by Shakespeare, Mr. Loftus Brock described the architecture of the castle, remarking first that the parish church of Caister just seen in passing was a comparatively modern structure, the old one referred to in Saxon documents being represented by a ruined square tower, in a field near the castle. As to the castle, he believed it was built in the moat of an earlier structure, for it was very unusual to see castles of Henry V.'s time with a square moat. The castle was remarkable on many accounts: for the early use of brick, and for being fortified and furnished with a keep at so late a date, in this confirming the President's suggestion, that in Norfolk and Suffolk the domestic buildings were moated and fortified to a late period, on account of the dread of piratical attacks. The little oriel on the ground-level, at the south-west angle, seemed to be the ladies' withdrawing room, from the great hall, while the windows on the upper floor pointed to a more usual position for the chief apartment. Close by on the north wall was the great fireplace of the kitchen. From William of Worcester, who was Fastolfe's secretary, and to whom archæologists owed a debt of gratitude, they learned the position of the buildings in two quadrangles, the domestic buildings being placed to the east in front of the great courtyard. Carriages were resumed to

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* Mr. J. T. Bottle, architect; illustrated in the Building News Nov. 19, 1875.

FILBY CHURCH,

approached through an elm grove, where an unexpected treat awaited those interested in church architecture. Externally the chief features of the church are a lofty square tower, ornamented with flint and stone panelling, and heavy crow-stepped parapets; windows of rich Late Decorated character, with rich tracery and good return hoods, but very shallow mouldings, splayed quatrefoil lights to clerestory, with rich tracery, and a thatched roof to nave, which like most of the churches in the district has no parapets. On entering, the fine lofty arcades to nave, supported on octagonal piers, supporting a roof of trussed rafters, and the excellent proportions and lighting are noticeable. The chancel has been very thoroughly restored, and we observed that the architect has thought fit to introduce into a church, no detail of which, except the font, is earlier than the 14th century, an open screen from base of the case to the organ, with shafted openings trefoiled, lancet-heads and delicate neckings, copied apparently from the purest Early English examples—surely, an anachronism. Mr. Brock, in a lecturette, pointed out how the history of the change of the impropriation which in King John's time was possessed by the King, but which in Edward III.'s reign passed into the hands of a private family, was reflected in the building. Here they had a new church, erected apparently about the first third of the 14th century, reconstructed within a hundred years—the arcades rebuilt, the south aisle altered, and new windows inserted in many places, apparently because the new possessors wished to improve the church to the taste of the day. The plain octagonal font of grey marble, usually called Purbeck, but which he suspected was in this part of Norfolk brought from Derbyshire, seemed to belong to a yet earlier church. In pre-Reformation days they knew by bequests that a light was maintained in St. John Baptist's Chapel, said to have been "in the churchyard" (of which no traces can be seen), and in other chapels in the church, and at that period every village church had its altars with lights at the east end of chancel and of north and south aisles, and one nave pier. The interest of the church centred in the fine base of the rood-screen. The upper part had disappeared, but traces of holes now filled up could be seen where the rood beam, here called the "perk," and to light which a bequest was left, went, and he suspected that the pieces of panelled work on some seats were parts of the embowered panelling which so commonly in Norfolk churches had filled up the rood-loft. The base of the screen yet standing was adorned with good 15th century cusped panelling, divided into eight compartments. These were occupied by as many saints, each with their emblems, painted on wood panels. The work would repay careful study, and would bear comparison with French paintings of the same period; the drawing was fair, the attitudes not stiff for the date, and the colouring harmonious. They represented, beginning from the north side—(1), St. Cecilia, bearing a wreath of flowers and palm; (2), St. George, with cross and shield, striking a dragon with his spear; (3), St. Catherine, sword and book in hand, and standing on a wheel, here remarkably small; (4), St. Peter with two golden keys. On the south side—(5), St. Paul, having drawn sword and book; (6), St. Margaret piercing a dragon; (7), St. Michael, weighing in scales a black devil against a soul arrayed in white, the latter seeming to have a good hope of escape from purgatory, as it is far the highest; and (8), St. Barbara, with a tower in one hand and a palm (in lieu of a feather) in the other—one of the rarest figures in English iconography. When the upper part of the screen was cut away the top was moulded in imitation of old work, an unusual attempt to make presentable alterations caused by change of theological belief. Some discussion followed as to the screen, in which it was determined by traces on the arcading that it extended over the first bay of the nave, and that parcloses inclosed the eastern ends of the aisles. A small door in the south side of tower arch is of much interest, recalling as it does the time when the churches of the district were refuges from pirates. It is of massive oak, closely banded with strips of iron, and having no fewer than seven locks, and an elaborately wrought ring handle. The members then proceeded towards Ludham, crossing Filby Broad by bridge, and passing by the wayside the ruined church of Burgh St. Mary, of which only a round western tower of flint, now ominously cracking from belfry light to external door; the fine church of Rollesby, with octagonal steeple of two stages, set on round base; and another church in ruins, as in other cases the tower here square, being the only part that has not been quarried away as building material.

LUDHAM CHURCH

is a very fine example of an unrestored Decorated and Late Perpendicular edifice. Outside the naked beams, projecting from under the lead roofs of nave and aisles, emphasise the Norfolk method of adding no parapets to walling; the tower is unworthy of such a building, and may, in conjunction with the isolation of the district, possibly account for the neglect of Ludham by topographers and guide compilers. Inside, limewash reigns supreme over arcades and walls. The nave roof is a fine hammer-beam construction, supported on corbels, but simply moulded at the angles. The spandrels are filled with pierced carving. The clerestory lights are of large dimensions, and, like the aisle windows, are filled with Perpendicular tracery. At the east end of the church is a reticulated window of wide span. On the south of chancel is a piscina and three richly encusped and crocketed sediliæ; the Communion-table is Jacobean. The seats in the nave include low benches, with poppy-heads at the west-end, and nearer the pulpit some wretched deal pews, clumsy and rickety; in one of these is a child's seat railed off. In the chancel are some chests, and in the nave an octagonal poor-box, greatly broken, eaten, and decayed, the latter containing, in lieu of treasure, filthy cobwebs. The font is richly carved, with figures of savages supporting the stem, and round the bowl the emblems of the Evangelists in duplicate. At Ludham, as at Filby, the best feature is the chancel-screen. Here it is very rich, and almost perfect. It is of very ornate Perpendicular work, with heavy crockets and cusps upon every division, and still decorated with colour and gilding, the former disposed in spiral patterns and now very dim. Above is the rood-beam, still in position; beneath this is open screen work, the lowest portion being solid, with exception of central opening, in which are modern half-leaves of deal. The panels on the west face are occupied with paintings of saints, not quite so well executed as at Filby, and on the rail runs an inscription, giving the donor's name and the date MCCCCLXXXXIII. The figures were deciphered by Dr. Raven, and from the half-effaced names below and the emblems as, reading from north to south, St. Mary Magdalene with box of ointment; St. Stephen with stone; St. Edmund King and Martyr with sceptre and arrow; and King Henry VI.; St. Augustine, St. Ambrose, St. Jerome, St. Gregory (some zealous Protestant has almost effaced the triple crown), St. Edward the Confessor, St. Walstan, of Banburgh, with sceptre and scythe; St. Lawrence with gridiron; and St. Appolonia with her tooth held in pincers. Mr. Brock again lectured, pointing out that in this church it was a Decorated structure, nearly rebuilt in Perpendicular times, and adding that by a little attention the woodwork might be preserved from decay. After dining at Ludham Crown, the excursion was closed by a visit to the scanty remains of

ST. BENET-AT-HOLM ABBEY.

These consist of a gatehouse partially inclosed in the sail-less and ruined cone of a brick windmill, some of the rubble walling of the church, and numerous foundations, and bare patches, and depressions in the marshy pasture. Under the windows of the gatehouse Mr. Loftus Brock, F.S.A., the indefatigable hon. secretary, read an exhaustive paper on the history and vestiges of this great mitred Benedictine abbey. The site, he said, now appeared one of utter desolation; a mound by the side of the river Bure, rising slightly above a wide waste of marshland till the other day flooded. On the higher ground, in the extreme distance, might be seen the towers of many churches, and closer were the windmills which partially drained the district. As if history were ironical, this abbey—of which the only conspicuous relic, its gatehouse, owed its existence to the now deserted windmill built into it—was the only one throughout the kingdom which had never been suppressed; to this day the Bishop of Norwich took his seat in the House of Lords as Abbot of St. Benet-at-Holm, and its revenues were still intact, and devoted to church purposes. Of the history of the abbey there was no need to speak; Dugdale devoted a most painstaking chapter to it, and referred to numerous documents which are named and are still extant, and a register of 1185 documents concerning the possessions of the abbey might be seen at the British Museum. He proposed to render a report of a survey which he recently made of the site, a work which had been previously only very superficially attempted. Of the abbey, he might say that it was destroyed by the Danes about 870, and after a time was revived by the Benedictines, and by the munificence of many pious men, it assumed a position of considerable importance. Among the illustrious people buried in the abbey were Sir Thos. Fastolfe, John, Duke of Lancaster, Lady Eve de Audley and her two daughters, and St. Margaret (so called), killed at Littlewood in 1170, and buried with the relics under the high altar. There is a chronological record of the abbots, and of a great number of lay men and women nominally admitted into the order, in accordance with the popular and profitable fashions of the 14th and 15th centuries. Of the structure, the documents show that a bell-tower existed at the west end, begun by Abbot Alwold in Saxon times, left incomplete by him, and finished by Abbot Richardus after the Norman Conquest. There was extant an old drawing of the church, which showed a central round tower, but in which the west tower does not appear. This central tower was mentioned by William, of Worcester. This plan of a church, with central and west towers, was adopted both by Saxons and Normans. But four examples existed now—at Wymondham, Ely, Wimborne Minster, and Shrewsbury; and it did exist at the Abbey Church at Bury St. Edmund's, at Hereford, and Romsey. Mr. Brock suggested that the appearance of the round tower at this abbey might account for the number of instances of its use in the neighbourhood, for it was no unusual thing to find a peculiar feature of an important edifice repeated again and again in humbler buildings. Abbot Daniel, 1133-53, described as a worker in glazing, built the fratery, dormitory, and chapter-house. Abbot Thomas, about 1186, built the refectory and the middle part of the cloisters. Shortly after this period the abbey was spoken of as being so strongly fortified as to be able to stand a siege.

Abbot Reginald, before 1229, built the great hall for strangers; and Adam de Netesherd, before 1265, laid the foundations of a new presbytery, or choired the church, which appears to have been completed by Abbot Richard de Buckerham, prior to 1275. Sir John Fastolfe in the 15th century was spoken of as the builder of the south aisle, and also of a Lady Chapel on the site of the chancel or presbytery where he was buried. This the lecturer thought was probably on the north side of the church. The evidences on the ground agreed with the references to side aisles to the chancel. Master Thomas Newton built Trinity Chapel in the abbey church. If the members looked out from the gateway they would see at a considerable distance lines marked out by pollard willows, and alders, and bushes; these marked the inclosing lines of the abbey. These trees, standing here and there on patches of masonry, and an encircling ditch, half filled up, were all that remained of the strong walls of mediæval days. A muddy causeway had brought them from Ludham up to the best preserved remains, those of the principal gatehouse behind him. This had been a building of remarkably good workmanship and of excellent design. It was of the middle period of the 14th century, and had been carefully constructed, with facings of freestone and flint. The mouldings were admirably worked, and still showed to much advantage, notwithstanding the lamentable state of ruin in which the building was. The entrance from the west (within the frustum of the old mill) was formed by a boldly-moulded arch, flanked on either side by a mutilated and octagonal turret. In the spandrels of the arch were remarkable figures—that on the sinister side being an armed man with a sword, and that on the dexter the remains of the huge rampant animal. Blomfield, on the authority of the discovery of a curious seal on a deed relating to the abbey, had suggested that the armed figure was St. Benet, who was rescuing an unfortunate monk from the jaws of a monster—the Evil One—who had taken him on his fleeing from the abbey, a serious warning to all brethren desirous of liberty. The range of shields which existed a century since about the inner arch was now illegible, except those of England and of France in the spandrels. The remains of a springer from an elegant wall shaft, having carved foliage to its capital, attested to a former vaulting, with diagonal and intermediate ribs. On the north side was still a newel staircase entered from the east. To the south of the outer entrance there remained a fragment of inclosing wall, pierced with loopholes, and of later date than the gateway. Proceeding to the eastern extremity of the abbey inclosure, Mr. Brock continued his lecture, pointing out that the area consisted of a waste area, bounded on the south by the river, and broken by small irregularities traceable to the practised eye as caused by the removal of buildings. At one place near the river, a rectangular depression lined with masonry, pointed either to a fish pond—for it now held water—or to a building whose floor line was lower than the ordinary ground. Along the river side a few feeble traces remained of a chamber, and of a retaining wall. Close to the edge of the stream at the south-east, might be seen a small low farm-house, built of fragments of the abbey, and doubtless built on the site of the water-gate; within it they would find a Gothic arched door of the 11th century. On the highest part of the site, near its centre, he was gratified to be able to identify and trace out the foundations of the abbey church. Gough had noted these as about a yard high, but from the silence of all more recent writers, he had feared they had perished. They showed—and the lecturer then indicated the remains as he spoke—that the church had an unusual plan. The nave was long and narrow, and without aisles, 134ft. from east to west, and only 32ft. wide. The north and south transepts were each 18ft. 6in. deep, and 98ft. across from north to south. The presbytery and its aisles were 79ft. across, and extended 93ft. eastwards from the central tower, while there might have been a further eastern extension. The total length as traceable was no less than 268ft. These remains were conspicuous on the north side of nave, where there were the bases of a series of bold buttresses so large as to warrant the belief that the nave was vaulted. These were admirably built of freestone and flint, and the lower plinth, and a moulded upper one, with necking above, might be traced all round. The wall was about 6ft. high, but at the east end of nave a height of 7ft. 6in. still existed. Traces of a newel staircase remained at the north-west angle of the north transept; with this all architectural features ended, the remainder of the buildings rising hardly above the ground level. The mouldings indicated the end of the 14th or beginning of the 15th century. The whole area had been excavated for earth as a top dressing for neighbouring fields, so much so that the interior offered no encouragement for excavation, and the nave walls were completely underground, the south wall having turned over on its side, and being only saved from utter ruin by buttresses of stone wall built under them; the north wall was saved from a like fate by the piers built up by Mr. Heath, a former tenant. In conclusion, Mr. Brock described the mode in which Henry VIII., when the see of Norwich became vacant at the time of the Dissolution, suppressed it in lieu of this abbey, making the Abbot of St. Benet Bishop of Norwich, but with only his old revenues. There was a widespread tradition that at this abbey refractory monks were sometimes buried alive. While making inquiries, he was informed that within the last 15 years two labourers at work on the site chased a rabbit into a hole. Pursuing the animal, they came on two huge vertical holes lined with masonry, in each of which they found a human skeleton. Unfortunately, the men removed the bones from the cells, and thus destroyed the evidence that bore a curious relation to the old story.

This anecdote provoked a storm of apparently sceptical questions in reply, to which Mr. Brock said he had not seen, nor could he give the exact site, of the wells of masonry which were said to exist to the west of the abbey church. The members then walked over the area, endeavouring to trace the outlines of the church and monastic buildings by the fragments of rubble-work and hard patches on the marshy ait. The general opinion seemed to be that the domestic buildings lay, as usual, on the south side, between the church and the river; but Mr. Reynolds argued, from the newel in the north transept, and other vestiges, that they were here on the north. Flanking the west front, southward, is a line of subterranean masonry, which appears to be the cloister bases, a similar position to those at Wells (the plan of which we published last week). The chapter-house probably adjoined the south transept. The members returned to Yarmouth by way of Ludham and Ormesby Broad.

During a further examination of the church, Mr. Loftus Brock made an interesting discovery. In the roodloft staircase Mr. Brock found three plain oaken panels covered with whitewash, two of them so shaped as to suggest a close fit to the spandrels of the chancel. Closer inspection proved that on these panels (coated since the Reformation with whitewash) still exist the rood-beam figures—that of our Saviour on the Cross, on the oblong panel, the others being as usual St. Mary and St. John. The execution is ruder than that of the screen panels. Such a treatment of the beam-figures is unique.

In the evening a meeting was held in the Council Chamber, the Mayor of Yarmouth in the chair. Mr. Thomas Morgan, F.S.A., hon. treasurer, read a paper on "East Anglia in Saxon Times," in which he traced the history of the district from the period of the occupation by Antoninus, and supported the theories of Mr. C. Roach-Smith with respect to the Roman roads of the south of England. Mr. George Lambert, F.S.A., followed with a paper on "The History of Maces and their Antiquity."

WEDNESDAY.

This was also a "carriage day" at Burgh Castle, and Fritton Herringfleet, and Lowestoft Churches. Leaving Yarmouth at 9 a.m. the members proceeded to the Roman station and camp at Burgh Castle, on a platform of land above Breydon water, the estuary formed by the rivers Waveney, Yare, and Bure. The members were welcomed by Sir Francis G. M. Boileau, whose father, the late Sir John Boileau, bought the ruins some years since in order to preserve them from destruction by a railway company. The remains consist of a parallelogram of rubble masonry, 642ft. from north to south, the other dimensions being smaller, but not very distinct. The walls are nearly perfect on three sides, the east being the most complete, and are 9ft. thick, and in many places 12ft. to 16ft. high, built of flint and rubble with bonding courses of tiles. There have been half a dozen solid circular towers, four of those on the east side flanking the outside of the walls, and an entrance 16ft. wide on the east. Many coins and remains of pottery have been found within the inclosure. At the north-east angle Dr. Raven delivered a lecture, in which he claimed for Burgh that it was the original Gariaonum, the Roman cavalry camp. He pointed out its commanding position, overlooking the estuary into which most of the Norfolk and suffolk rivers found their exit. The masonry, it would be seen, was not all of one period—the upper portion was less skilfully constructed, and the same place of fracture was noticeable at every point of overturning. Mr. Harrod, who conducted the excavations for the late Sir John Boileau, thought the camp stood on a British earthwork, because of the height inside the ramparts; but he saw other reasons for this, and the extreme regularity militated against the theory. The question would arise whether this was a three or four-walled camp, and he thought, though the east side did not now exist, that it had been there, but had been removed by the inhabitants. Mr. Harrod found on this side piles, which appear to have supported the walls. That it was later than Caister the coins found in both camps evidenced, and the superstructure he should refer to the post-Constantine date, having probably been added shortly before the departure of the Roman legions. The old road of communication seemed to have gone on the Herringfleet side of Fritton-lake towards Dunwich. Mr. Brock pointed out that in the lower part of the wall pounded brick was used in the masonry; while in the upper portion, also undeniably Roman, but not so well constructed, no brick was used in the mortar. Again, the towers were bonded into the walls only at the top. In the ancient wall in Camomile-street, City, found a few years since, it had been contended that it could not be Roman because no pounded brick existed in the mortar, and the bastion was not bonded into the wall, whereas both these omissions prevailed here. A general discussion ensued on the Roman camps, and it was shown by Mr. Morgan that this is one of the latest camps by the form, the earlier ones having been square, while afterwards they assumed an oblong shape. The existence of the riverward side, although its destruction is paralleled at Richborough and Pevensey, was doubted by some. To the east what was declared to be an amphitheatre was inspected, but nothing more than an elliptical depression in a field of ripening corn could be observed.

ST. OLAVE'S PRIORY.

The scanty remains of this establishment were seen, consisting of a groined vault of two bays, with chamfered brick ribs, which Mr. Brock identified with the fratery, and a barn, despoiled of its open roof within the last quarter of the century, and a few walls and fragments built into cottages. The priory was a very small one, of Augustinian Canons, founded in the time of Henry III., by Roger Fitz-Osbert, and was early suppressed. The crux here is to find the monastic church, which Mr. Brock considered lay to the south, on the lines of some modern ivy-clad walls. The refectory was to the south of the fratery, and beyond it are remains of the guest-chamber.

FRITTON CHURCH

(St. Edmund) was next visited. It is a small but most interesting example of a Norman village church, consisting of a round west tower, small nave, chancel, sacrarium, and low eastern apse, with vaulted roof and three windows, internally decorated with zigzag mouldings, on which traces of colour remain. Both nave and chancel are thatched. The nave was enlarged about 1350, by extending the south side of nave, so that the axes of west tower and chancel are different to the axis of the nave. The church is profusely whitewashed, but on the wall opposite the south porch a space has been cleansed showing a figure of St. Christopher. Here are worked up many Roman bricks and masses of rubble appropriated from Burgh Camp. Afterwards the members partook at Fritton Decon, a modern Elizabethan mansion, built from Mr. Jeckyll's designs, of the hospitality of Mr. H. E. Buxton, in a marquee on the lawn.

Herringfleet Church, the next building visited, belonged to St. Olave's Priory. It is chiefly of Norman character; the window in the upper stage of the round tower has often been illustrated in architectural glossaries and handbooks; in it two triangular-headed windows are inclosed by a circular arch, with blind tympanum. At the east end and in the south windows of chancel the lights are filled with a heterogeneous collection of painted glass, chiefly brought piece by piece from a monastery in France, at the period of the Revolution, but some is Flemish of 14th Century, a little is German of the best class of Albert Durer school, and a few fragments and shields come from the Abbey of Bury St. Edmund's Some discussion took place with reference to the windows in the tower, the conclusion arrived at being, that the tower, like the south door of nave and the north side of nave, is Norman. Somerleyton Church, rebuilt at the cost of Sir S. M. Peto, in 1854, was next seen; its 15th Century chancel screen, with painted figures, altar, and font cover, and the founder's tomb, a 14th Century work, in the churchyard being worthy of notice. From thence the members proceeded to the old parish church (St. Margaret) of Lowestoft, a large and Perpendicular edifice in one span, with Earlier and small tower and spire, situate considerably inland from the town. The architectural features of the building were pointed out by Mr. J. L. Clemence, of Lowestoft, under whose care it has been restored. Time would not permit of a visit either to the ancient fishing village or modern watering-place of Lowestoft, and the party proceeded to Corton, where they were received by Mr. J. J. Colman, M.P., and returned to Yarmouth in time for an evening meeting.

Yesterday (Thursday) the members were to be the guests of the President, being conveyed in carriages from Harleston station to Wingfield Castle, where they were to be formally received by Lord Waveney, and to proceed to Wingfield Church. Afterwards it was proposed to drive to South Elmham Minster and Roman Camp, to Flixton Hall, Lord Waveney's seat, and to Bungay, returning by special train to Yarmouth in time for an evening meeting.

The programme for to-day (Friday) provides for a long journey southwards by rail and road, to what remains of the ancient city of Dunwich, and the almost somnolent borough of Southwold. Saturday, like the opening day, will be spent in Yarmouth, the great parish church, the Tolhouse, and Gorleston Priory being visited. Monday the scene shifts to Norwich, the Cathedral being inspected under Dean Goulburn's guidance, immediately after the official reception in the Guildhall. In the afternoon, and on Tuesday, the numerous churches and other antiquities of the city are to be viewed, and on Wednesday the Congress will conclude with a visit, by invitation of the Dowager Marchioness of Lothian, to Blickling Hall, near Aylsham, returning by way of Cawston to Norwich. We shall continue our report in our next issue.

CONSTANT WATER-SUPPLY TO TOWNS.

TWO important papers referring to the question of constant water-supply to towns, were read last week before the Institution of Mechanical Engineers at Glasgow, viz., one by Mr. Stephen Alley, of Glasgow, "On the maintenance of constant service in water-pipes," another by Mr. W. H. Thomas, of London, on "The Barton water-regulator or reducing-valve." Mr. Alley commenced by saying, that the experience of water-engineers proves that with proper management, it is possible to maintain a constant supply with as much economy as can be obtained on the intermittent system. If that is really so, the sooner it becomes the rule, and the dirty and unwholesome cistern is dispensed with, the better for the public health. The most serious objection to the intermittent system, according to Mr. Alley, as the fact that the gases arising from water-closets and other sources, sewers for instance, are liable to be forced by the pressure of the atmosphere into the water-mains when the water is shut off. It has been proved—notably in Manchester—that a constant service, when combined with a regular system of house-to-house inspection of taps and fittings, may be obtained with a saving in the consumption of water as compared with an intermittent supply; but the chief source of waste is undoubtedly leakage through the service pipes and fittings, caused by pressure. This pressure is highest between midnight and 5 a.m., just that portion of the day in which it is practically impossible to make a house-to-house inspection, with the view of detecting defective fittings. To be able to adjust the pressure in the mains to the supply required, and no more, is then a *sine qua non* of a constant service, and the means of effecting that is provided by a governor invented by Mr. W. Foulis, whose gas governor is well and favourably known. Mr. Alley proceeded to describe this apparatus, which is analogous in its action to the gas governor. If, for instance, the pressure on the main supply is 100lb. per square inch, and it is desired to put on a pressure in a given district of 40lb., the governor being once loaded to that pressure will maintain it, although the pressure at the inlet varies, or the consumption falls to a minimum. Hence, if all the pipes and fittings in a district are capable of notwithstanding that pressure there can be no unintentional waste, and leakage will be reduced to nothing. The principle of water regulators is almost identical with that employed in some well-known steam-reducing valves. In Mr. Foulis's design we have a piston and a valve connected to a ram in such a manner that the outlet pressure is maintained equal to whatever weight is placed upon the ram, and the largest valves can be worked by weights of a pound. Barton and West's pressure-reducer is made in different sizes, and can be applied to pipes as small as ½in. in diameter. The valve is perfectly balanced so far as the inlet pressure is concerned; hence, if there is no pressure in the outlet main, the valve falls from its seat by its own weight, and allows water to pass. When the pressure on the outlet main becomes sufficient to lift the valve it forces it back to its seat, where it remains until the pressure in the outlet is again reduced. The valve is adjusted to the required pressure, and any variations in the inlet pressure exercise no effect upon it. These two papers were discussed together, and gave rise to a great deal of criticism. It was pointed out that the friction of the cup leathers attached to the pistons of the Foulis regulator was a variable quantity, and that the gun-metal linings of the cylinders were apt to become worn only in that part where the piston travelled most frequently, so that a ridge was formed at each end of its usual travel; hence, when the pistons are made to travel a greater distance than usual they are liable to stick. Both the Foulis and the Barton and West valves have, however, been in use for some time, and an elaborate series of experiments with the latter have been made at the South Essex Waterworks. Mr. Thomas then read a paper on Barton and West's water-meter, which has also been tested at the South Essex Waterworks, and gave good results when tested against Siemens' and Kennedy's meters. A discussion, mainly devoted to criticism of the details, followed the reading of the paper, and it seemed to be pretty well apparent that a perfect water-meter has yet to be invented.

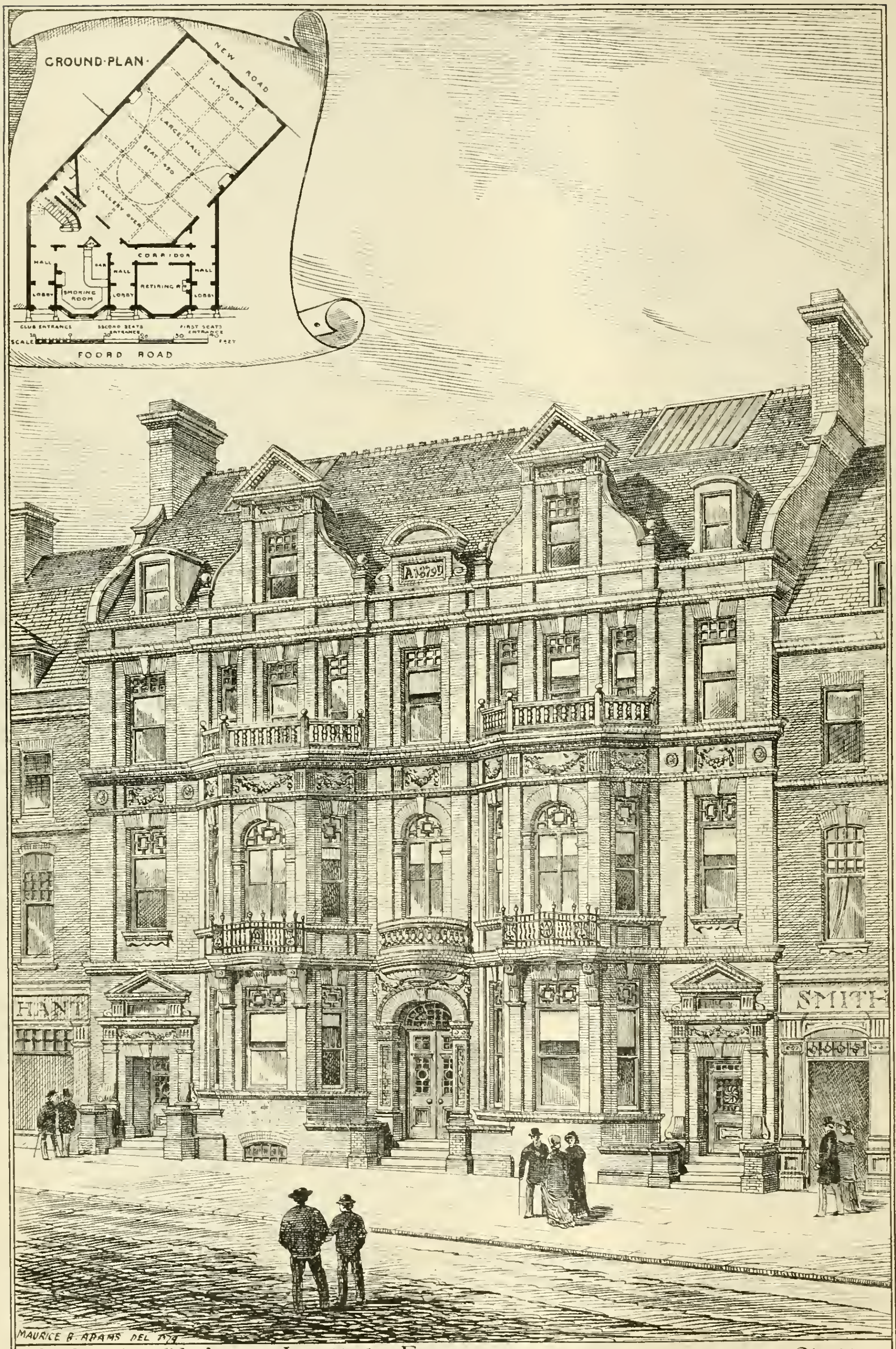
NATIONAL WATER SUPPLY.

THE Society of Arts has just issued the report of its last conference on national water supply. It includes six of the essays, illustrated with maps, which were sent in to compete for the one gold and three silver medals offered by the council of the society for "suggestions for dividing England and Wales into districts for the supply of pure water to the towns and villages of each district." One of the conditions was that the suggestions were to be based on evidence already published. Twelve essays were sent in, but they were not all selected as worth printing. The gold medal was not awarded, and only two of the three silver medals were awarded, the medalists being Mr. F. Toplis and Mr. Joseph Lucas, F.G.S. The adjudicating committee was composed of Professor Abel, F.R.S.; Mr. John Evans, F.R.S.; Captain D. Galton, F.R.S.; Professor Prestwich, F.R.S.; Professor Ramsay, F.R.S.; and Mr. G. J. Symons, F.R.S.

Mr. Toplis points out that if we were starting *de novo* to map out England into districts for water supply it would be an easy matter, but we have to deal with existing arrangements and with vested interests. He alludes to the great difference of opinion there is among those regarded as authorities as to what is a suitable water supply. For example, while the so-called purity of chalk water is extolled by some it is denounced as too hard by others, and while the Royal Commission of 1869 went very fully into the question of the water supply of London, it left almost untouched the larger question of the supplies of provincial towns and the country. Mr. Toplis suggests the division of England into 12 districts, with a body of commissioners to be appointed for life to each district, who should have legal and engineering advisers. They should have control not only over waterworks, but also rivers and watercourses, and, in fact, over ever drop of water falling in their district, and they should have power to acquire all existing waterworks. All existing Commissions he believes must be abolished. It is not suggested by him that the body should have control over sewage arrangements, for he believes that it would be better to keep these as they are, and that the water supply commissioners would look better to the efficient carrying out of arrangements for preventing pollution if it was not left to them to do it themselves. He believes the time is not far off when we shall have a Minister of Health, and this official would put right any differences between the two bodies. The first thing needed, it is urged, is to have a royal commission to collect all that is known on the subject of water supplies, and a year is mentioned as the probable time this work would occupy. The Government should then introduce a Bill for forming the districts and appointing the commissioners. Arrangements should be made for a two-fold rate—one for supplying water and the other for improvement of rivers and the prevention of floods. It used to be held that only the lands subject to floods should be rated; but it is pointed out that lands contributing flood waters should also be rated. It is estimated that five years would suffice to get the commissioners into working order. The duties of the commissions would be—1, providing against pollution; 2, providing against floods and storming; 3, providing water supplies and seeing that these are of the quality and quantity needed. A schedule of the proposed districts and particulars respecting them follows, and in conclusion Mr. Toplis points out that at present very little is known with certainty as to the amount of rainfall which can be collected in any district, either as upland or subterranean water; and as very few rivers are regularly gauged, it is impossible to know the amount of total rainfall that reaches rivers. Accurate information is also wanting as to the existing supplies of small towns and villages.

The essay by Mr. Lucas considers, in the first place, existing areas and boundaries of administration for sanitary purposes, and draws attention to the fact that the recommendation of the Sanitary Commission of 1869 that "local administration must be maintained, but simplified, strengthened, and set in motion" has not been acted upon. What is mainly wanted is "a real motive power." Mr. Lucas suggests that the country should be mapped out into watershed areas, each under a watershed board. These watershed boards should be under three commissioners, each with two sub-commissioners, and that they should be under the supervision of the Local Government Board. Mr. Lucas puts forward as a great advantage of this scheme that the watershed boards would have resident among them sub-commissioners who would be more readily accessible for advice than the Local Government Board now is, while the interposition of a commissioner between them and the Local Government Board would do much to smooth differences. The duties of the watershed boards would be to enforce the Public Health 1875 and the Public Health 1878 Acts, to levy rates, to conserve the interests of underground water systems, to examine schemes, and also to remove causes of pollution. Mr. Lucas concludes his essay with a draft of a Bill.

The Hull Corporation received last week a report from Mr. Bateman, C.E., with reference to the question of increased water supply for the town. In it qualified approval is given to the scheme propounded by Mr. Maxwell, C.E., for the construction of the easterly adit from Springfield, although Mr. Bateman does not anticipate so large an increase as Mr. Maxwell hopes for, and at the same time he expresses the opinion that the consumption of water in Hull is unnecessarily large, and that the adoption of stringent measures to restrict waste will be attended with benefit. The report was adopted by the Corporation, who instructed the borough engineer to prepare detailed plans for the eastern adit.



Mechanics·Club·and·Institute·FOLKESTONE· ✻ Reginald·Pope·Architect

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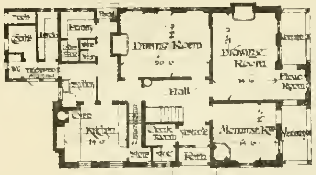
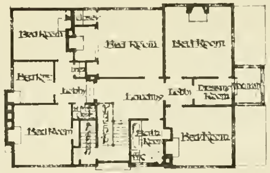
Rudgwick·near·Horsham·SVSSEX·

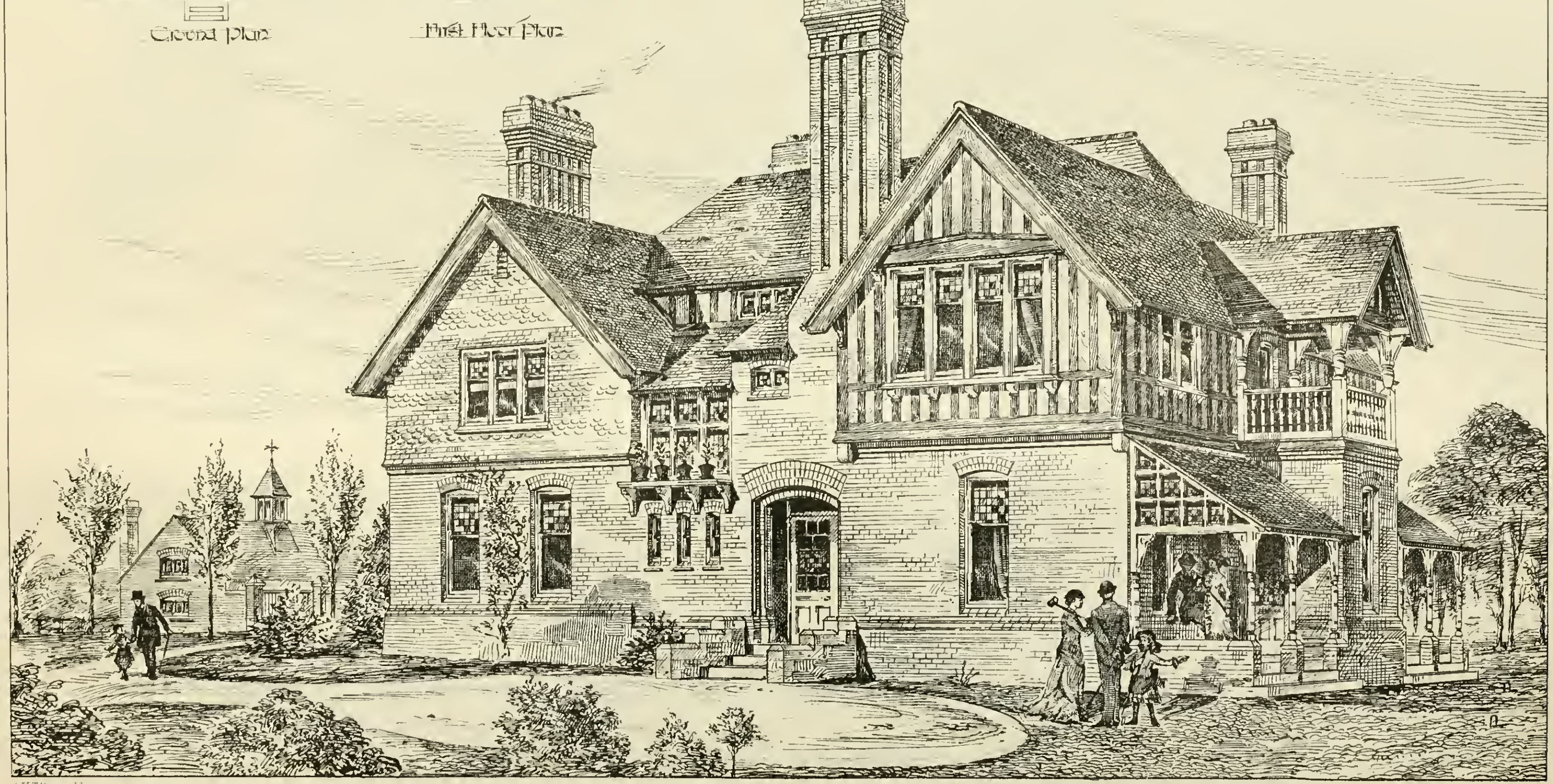
Henry·Shaw·*Architect*·



Ground Plan



First Floor Plan



H.Tiltman ld

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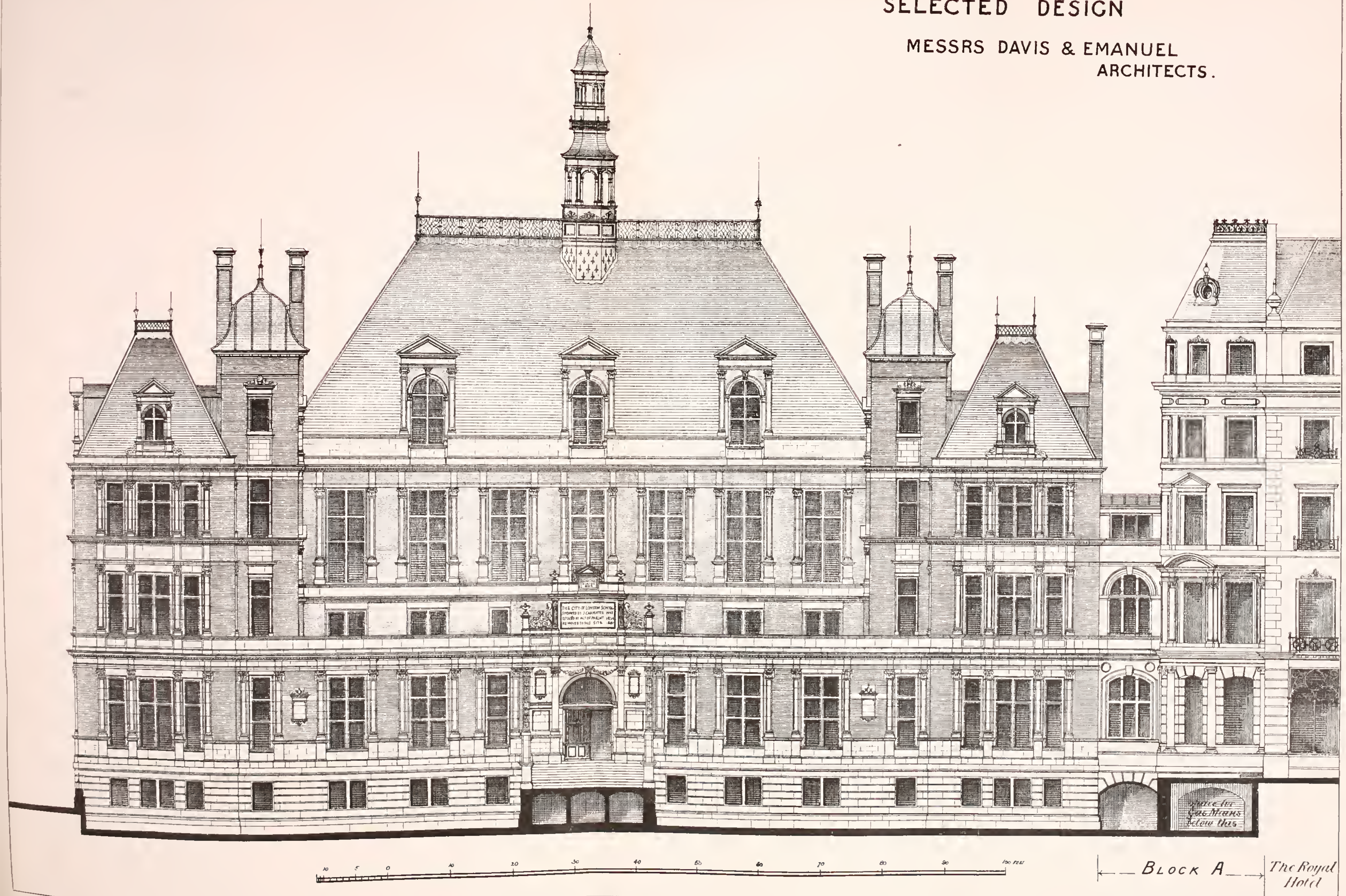
CITY OF LONDON SCHOOL.

SELECTED DESIGN

MESSRS DAVIS & EMANUEL
ARCHITECTS.


THE CITY OF LONDON SCHOOL
FOUNDED BY J CARPENTER 1442
ESTAB BY ACT OF PARLMT 1834
REMOVED TO THIS SITE
Space for Gas Mains below this
10
5
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100 FEET
BLOCK A
The Royal Hotel

ELEVATION FACING THE VICTORIA EMBANKMENT

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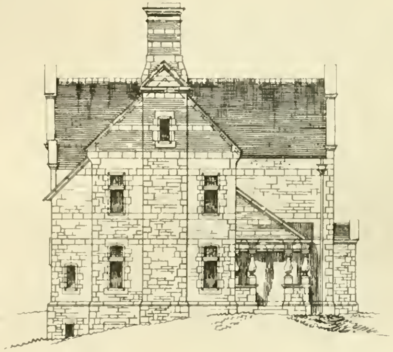
Side ·



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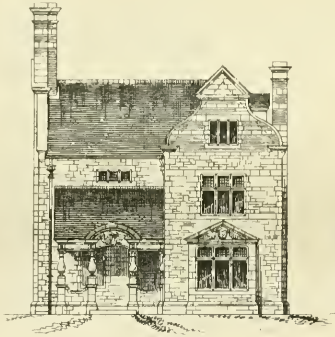

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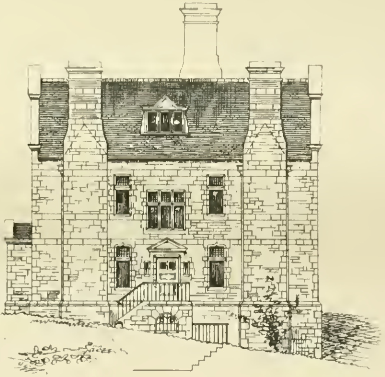

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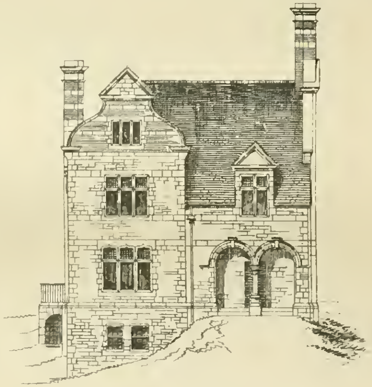
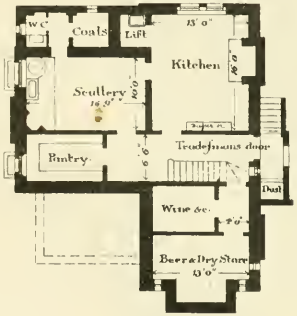


HOVSE · at · BLOOMFIELD · NEW · JERSEY · U·S·A·

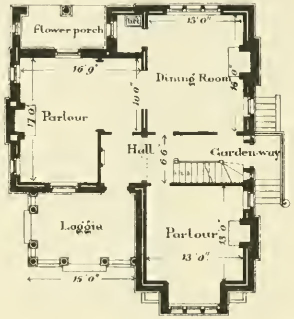
for Edward · S · Wilde · esqre ·

Maurice B · Adams · A.R.I.B.A. Architect,

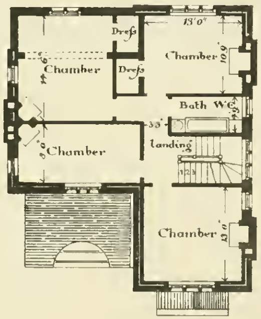
April 1879



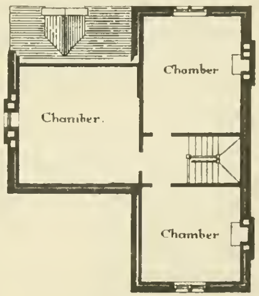
Basement



Ground plan

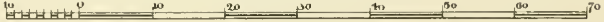


First floor



Second floor ·

Scale · of · feet



MAURICE B ADAMS del

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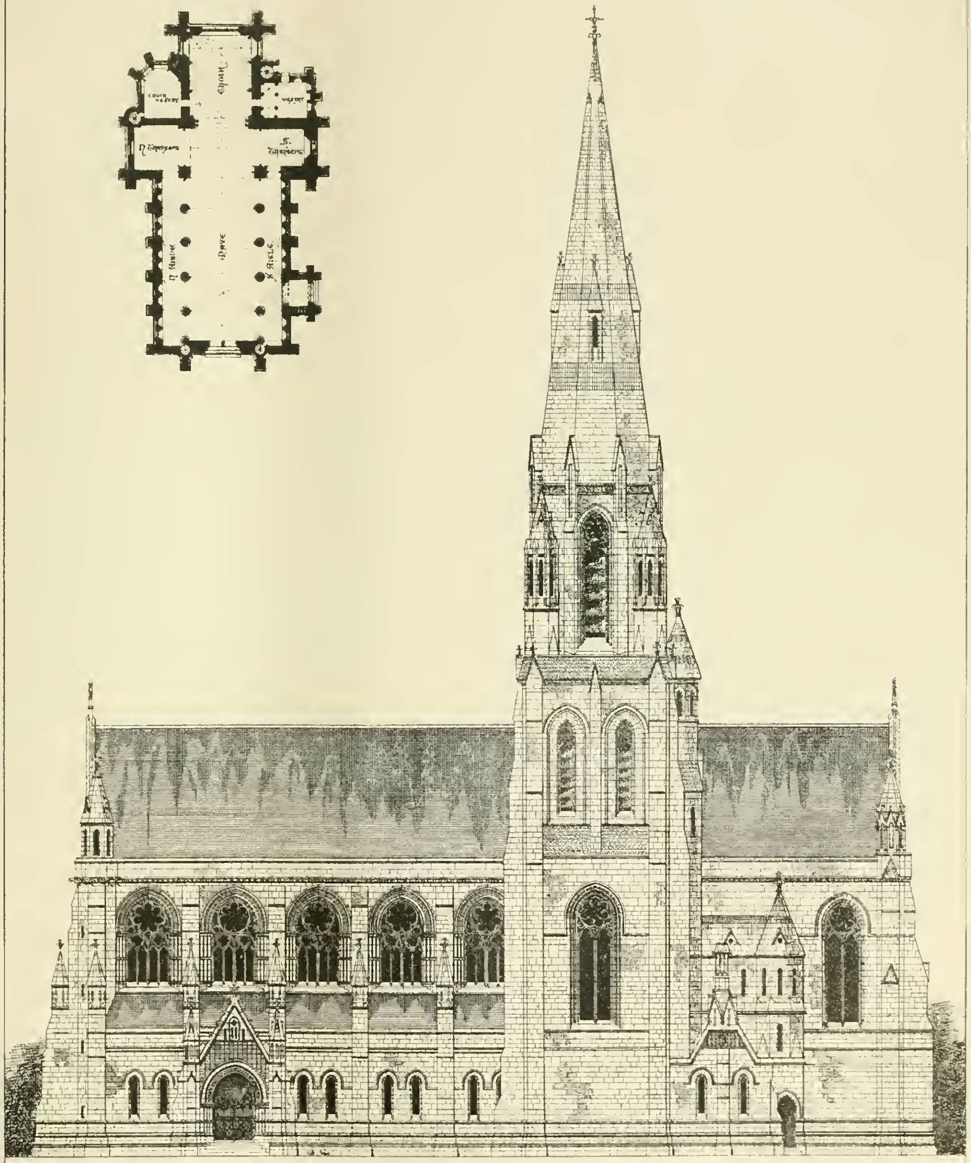
NATIONAL GOLD MEDAL AWARDED TO J. A. STAMP, NOTTINGHAM. 1878

Design for a Church.



South Elevation.

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SELECTED DESIGN FOR THE NEW CITY OF LONDON SCHOOLS.—HOUSE AT BLOOMFIELD, NEW JERSEY.—MECHANICS' CLUB AND INSTITUTE, FOLKESTONE.—HOUSE AT RUDGWICK.—NATIONAL GOLD MEDAL DESIGN FOR CHURCH.

OUR LITHOGRAPHIC ILLUSTRATIONS.

THE NEW CITY OF LONDON SCHOOLS.

The design for this building, to which the first premium of £300 was awarded, is by Messrs. Davis and Emanuel, of Finsbury-circus, who are engaged to superintend its construction. We gave a block plan and a full description of the building in our issue of June 13, and shall publish next week the side elevation, together with ground plan, first-floor plan, and part of second-floor plan. The style is French Renaissance of a moderate type, the materials to be used in construction are red brick, with Ancaster Stone dressings, with green slates for the roofs, and the estimated cost, exclusive of fittings, is £51,000.

HOUSE AT BLOOMFIELD, NEW JERSEY, U.S.A.

This house is one of a series to be erected at Bloomfield, New Jersey, U.S.A,, and is now in course of building from the drawings and details sent from London. Since the plans, which we publish to-day, were made, some improvements have been effected in the original arrangements which were prepared to meet the suggestions of the proprietor, Mr. Edward S. Wilde, of New Jersey. Externally the elevations are the same, the chief departures from the first plan being an improved treatment of the first parlour, and rearrangement of the bath-room, &c., on the chamber floor. A basement in all houses in America is an advantage, as it is almost a necessity on account of the severe frosts, which would upheave many of our more lightly-constructed houses in this country. Mr. Wilde is intending to introduce several ideas into his houses which he acquired when visiting England this year. The walls are of local stone up to the eaves, above which red brick is introduced to give colour. The roofs are covered with slates and red ridge tiles. Quarry glazing is introduced into the upper lights of the windows, those which are made to open being metal casements. The staircase window is to be filled with stained glass. Mr. Maurice B. Adams, A.R.I.B.A., is the architect.

MECHANICS' CLUB AND INSTITUTE, FOLKESTONE.

This scheme was originally promoted by the Lodge No. 426 A.O. Druids, for the purpose of providing a room for meetings and social advantages, without the necessity of attending a public-house. It has, however, gradually developed itself to a much larger extent than was at first contemplated. A limited liability company has been formed and registered under the title of "The Folkestone Working Men's Club and Institute Company, Limited," with a capital of £4,000 in 4,000 shares of £1 each, and directors have been appointed representing all the benefit societies in the town. The accommodation provides club rooms, reading, smoking, and billiard rooms, kitchen, and offices, with lift to each floor, and a large hall for lectures and entertainments to seat 450 persons, exclusive of galleries. The space under large hall is to be filled up with hot and cold baths, about 20 in number, for the accommodation of the public generally. The site is freehold, and situate in Ford-road. The building will be carried out in red brick, with terra-cotta dressings. The architect of the building is Mr. Reginald Pope, of Folkestone.

HOUSE AT RUDGWICK.

This house has recently been erected at Rudgwick, near Horsham, Sussex, for J. T. Renton, Esq., from the designs and under the supervision of Mr. Henry Shaw, of 25, New Broad-street, E.C. Walls are of local red brick, tile hanging, with half-timber-work is used in the upper portion of the building, the roof being covered with Bridgewater tiles. Messrs. Stephens and Bastow, of Bristol, were the contractors.

DESIGN FOR A CHURCH.

We illustrate the prize design for this subject to which the National Gold Medal was awarded last year, the author being Mr. J. A. Stamp, of Nottingham, who this year is also well represented at the South Kensington Exhibition of Prize Drawings, noticed elsewhere. We spoke favourably of Mr. Stamp's design for a church in Geometrical Pointed, in our review of that exhibition, and our readers will now have an opportunity of judging for themselves. The elevation we give is characterised by good proportions, and refined detail, and we consider the work equal if not superior to any of the designs submitted, and upon which we commented last week. The tower and spire are graceful in outline, and exhibit a purity and simplicity of treatment that is refreshing, compared with the very florid specimens generally sent for exhibition. The nave, clerestory, and porch are dignified and well drawn. We hope shortly to illustrate this year's prize drawings for the same subject.

COMPETITIONS.

Bushey.—The designs of Mr. H. H. Bridgman have been selected in limited competition for the new board schools about to be erected at Bushey, Herts. Seven architects were invited to compete under motto. The motto of the designs accepted was "Success."

Eccles.—The plans of Mr. J. Lowe, architect, of Manchester, for the proposed Town Hall at Eccles, have been selected from a number of others that were sent in for competition. The estimated cost of the building is £5,000.

Gloucester Lunatic Asylum.—In January and March last the Committee of the Gloucester County Lunatic Asylum offered premiums of £150 and £75 for the best and second best designs for their intended new asylum. Twenty-eight sets of designs were sent in, and the award has been made this week. The first premium has been awarded to "Experience," a design which we had occasion to notice very favourably in our review last week. The authors are Messrs. Giles and Gough, 28, Craven-street, W.C. The second premium is given to "By Sunshine all Day," sent in by Mr. J. P. Pritchett, of Darlington; and "Utilitas" (Messrs. Bromilow and Cheers, of Liverpool), and "Glory of Glevum" are awarded honourable mention. The estimate of Messrs. Giles and Gough is 4½d. per foot cube all over; total, £94,000; including £13,000 for chapel, superintendent's house, drains, gas, water mains, tanks, and all engineers' work, roads, &c. Provision is to be made for 714 patients, with an administrative department large enough for 1,000. With the two additional blocks for 186 patients—total 900—the cost would be £122 per bed.

Greenock.—The following are the six plans which Mr. Barry in his report recommended to the Town Council, with the relative cost of each in round numbers: 1st, "Art and Science," £88,000; 2nd, "Omega," £64,000; 3rd, "Let Greenock Flourish," £73,000; 4th, "Qui dit Progress dit Labeur," £70,000; 5th, "Ciconia," £83,000; and 6th, "M.B," £70,000. These six plans have been placed in the hands of Mr. Robert Scott, of Glasgow, who was recently appointed measurer for the new buildings, who will check the prices, and it is quite possible that the estimated cost of each, or at least of some of them, as given above, may be altered. The plan having attached to it the motto "Art and Science," which Mr. Barry has placed first in the order of merit, is the work of Messrs. H. and D. Barclay, Wellington-street, Glasgow. The various architects were limited to the sum of £80,000 as to the estimated cost of the buildings. Mr. Barry's report has been ordered to be printed, in order that each Councillor and Police Commissioner may be furnished with a copy.

Prestwich.—The directors of the Conservative Club, Prestwich, having decided to erect new club buildings, invited several Manchester architects to submit designs in competition. Those submitted by Mr. William Dawes, of Cooper-street, have been selected, and tenders have been obtained for the works, which will be proceeded with at once, under the architect's superintendence. The buildings will be erected on a plot of land in Church-lane. They will comprise a large meeting and reading-room, retiring-room, secretary's room, porter's living-rooms, and office, with general conveniences on the ground floor; two billiard-rooms, card-room, lavatory, and bath-room on the first floor; and gymnasium, lavatories, wine and beer-cellars, coal and wood-stores, and heating chamber, in the basement. The billiard-room will have a roof light in addition to the end and side lights, and will be fitted up with three tables. The gymnasium will be well lighted by large windows, opening into an area extending the whole length of the building. There will be three entrances on the ground floor, two opening into the front hall, and the other into the staircase leading to the gymnasium. The door forming the side entrance will be used only at times when large meetings are held, and is intended merely as a crush-door to facilitate a free exit. The buildings will be constructed of brick with stone dressings. There will be a small tower at the corner nearest the main road.

The Orme Billiard Table Design Competition.—In the competition arranged some time since by Messrs. Orme and Sons, 11 and 13, St. Ann-street, Manchester, in which they offered £120 for designs of billiard-tables, &c., the followings awards have been made:—Class 1. L. A. Shuffrey, 6, Abbey-road, London; £50 for the handsomest design of a billiard-table of any style, the design to be of a rich character, and regardless of expense in manufacturing. Class 2. John Ainsworth, 78, Croston-road, Elton, near Bury; £25 for the best design of a billiard-table suitable for a house, of no special style or character. Class 3. Amos Hall, care of J. Barradale, Esq., Stanley-chambers, Gallowtree-gate, Leicester; £15 for the best design of an inexpensive billiard-table. In this competition the judges will be instructed to select the table that combines the best effect with the least expense in manufacturing, a table for the million being the desideratum. Class 4. Fred. G. Knight, 1, Princes-street, Storey's-gate, London; £10 for the best design of a marking-board, combining the arrangements for scoring the games of billiards and pool. Class 5. W. Henry Jewitt, Oxford-chambers, Manchester; £20 for the best sketch of an interior of a billiard-room, ideal or otherwise, showing all or part of the billiard-table, marking-board, &c.

CHIPS.

In our report of the reopening of Holy Trinity Church, South Shields, last week, we stated that the contractors were Messrs. Walter Scott and Son, "Newcastle-on-Tyne." It should have been "of Sunderland."

The opening of Kay Park, Kilmarnock, and the unveiling of Burns' statue, took place on Saturday last. The park cost £13,000. The statue is by Mr. Stevenson, Edinburgh.

It is intended to complete the tower and spire of St. George's Roman Catholic Cathedral, Southwark, according to the original design of the elder Pugin, who was the architect of the building.

GLOUCESTER ASYLUM COMPETITION.

[SECOND NOTICE.]

"By SUNSHINE ALL DAY" — (the second premiated design)—is a plan with diverging corridors, but the angles joined by curved corridors, and the ends extended in the line of the base of a triangle to the north of the chronic block. The kitchen and stores corridors turn outward with a quadrant corridor to reach laundry and workshop blocks. The administrative block is a small one, the stores and medical staff, and housekeeper being placed at the side, and the kitchen and dining-hall in the centre. The greater part of the female stores, crockery, &c., are placed on the first floor. This makes the ground floor appear small, and the difficulty of service must condemn this arrangement. The blocks are well placed to the south of the diverging corridor, and are designed with a corridor through the block, dividing the day-rooms from the single-rooms. The latter are placed in annexes and are too far from the day-rooms and attendants. The water-closets are in these annexes too far from day-rooms, and three w.c.'s for fifty-one patients is not sufficient. The sculleries are placed in the centre, lighted from the ward corridor, and no external light or air. There is an alternative plan in red showing no corridors in the wards, but in this the patients in one day-room have to pass through the other to get to their day-room. There is an alternative plan, showing the blocks standing at an angle of 45 degrees to a straight serving corridor; in this the blocks echelon to each other; but the most prominent object in one day-room would be the water-closets of the other block. This alternative had better have been left out. The elevations (there is no perspective) show a simply-designed Gothic structure of red and white bricks, with stone heads and pointed arches, the tympanum filled in with red herring-bone bricks. The roofs are of steep pitch, and look excessive. The block plan shows the buildings and roads of approach cleverly, and there is an alternative showing the buildings placed at the extreme north of the ground, this and "Experience" being the only competitors showing this necessary alteration to instructions. The mode of illustrating this design by a series of small plans is not so good as that adopted by other competitors.

"Light and Air" is a plan with corridors diverging at an angle from the centre block, and a straight base or serving corridor connecting the two arms. The general dining-hall is placed in the centre of the south front, and the whole of the administrative block is placed to the north. Two chronic blocks are shown on each side, and the laundry and workshops blocks are placed at the extreme ends of corridors to the north of the chronic. There is a large inclosed yard. The general arrangement is good, but the blocks and administration are not so good in detail. The epileptic dormitory is placed to the south of the general corridor, and some of the single rooms have no external light and air. The elevations are very indifferent. The perspective shows a good building, but the other drawings lack refinement and require maturing.

"Thought" is a compact plan, but no attempt is made at echelon. The blocks are placed behind each other on the pavilion plan, and the epileptic dormitory joins the two blocks; single rooms open on day rooms. The elevations show a palatial building.

"I. O."—This is a plan showing the blocks echeloned slightly, and joined together by curved corridors as is usual in America. There is no service or working corridor, except through the blocks. The elevations show a simple brick building of a Gothic character.

The author of "Desideratum" seems to have a strange notion of echelon; the corridors diverge, but in the opposite direction to other competitors, and are ziz-zag, with octagonal rooms at their junctures. The principal portion of the south front is occupied by the workshops and laundry blocks. The plan is impossible. There is a well-designed elevation in the Queen Anne or Free Classic, so far as regards the administrative block. The other elevations are too highly-coloured and look heavy.

"Mens Sana" is an attempt to show the Gloucestershire magistrates what they should build—not a serious attempt to gain the competition, as none of the instructions are followed.

"Concours" is a very ingenious plan, and is illustrated by a model. It can hardly be said to echelon, but there are several clever bits of planning in it. The infirmary block is especially good. The mistake of taking up the main south front with the coal-shed, and the laundry, and workshops, must prevent this plan having its merits examined. Our advice to its author is to try again, as the arrangements would be good for a smaller asylum.

"Æsculapius" does not echelon. The blocks abut on a long straight corridor with a staircase at end stopping future extension. "Deo Juvante" echelons two blocks and returns the other at an angle on each side. It is compact, but is not a good *echelon* plan. Elevations are good, of a Classic character. "Progress" does not echelon; the blocks are placed behind each other; there is no drive into the kitchen court; the theatre and dining-hall are separate rooms. "Choose well: your choice is brief but endless," is a well planned asylum on the American model; the blocks all joined together by staircases and connections through the blocks. The elevations show elaborate Gothic architecture with framed barge boards and mullion and transomed windows. The want of a service corridor is fatal to this plan. "A. R. I. B. A." shows a fairly designed asylum, with a combination of diverging and cross corridors; the blocks echelon, but have only half their sides with a clear south aspect, as they overlap. The day rooms have each a south aspect. The administrative block is placed to the north, and there is a good drive into the kitchen court. The committee rooms are placed on the first floor. This is objectionable. There is no main thoroughfare, and the corridors are confused. "Sunlight" is a straight corridor, with cross corridors, and blocks at each end one behind the other, the other blocks being placed to the south of corridor. The author does not seem to have grasped the idea of an echelon plan; the blocks in detail are fairly designed.

NOTES IN THE WEST.

THE Penzance School of Art Committee having offered a premium of five pounds for the best design for a new school, five responses have been the result. One came from Plymouth, another from Penzance, one from Redruth, one from St. Michael's Mount, and the fifth from Tywardreath; the latter, bearing the motto of "Unity," was chosen, and turns out to be the work of Mr. Sylvanus Trevail, architect, of Tywardreath. The estimated cost of the building is £1,000.

The parish church of S. Martin at Camborne has been restored, and its reopening is announced; and another Cornish church, that of St. Gwinear, at Gwinear, some three or four miles from Camborne, is now in course of restoration.

Gwinear is unique thereabouts in having two north aisles, built by the Arundels. When, some time since, the plaster was stripped from the aisle wall, a fresco, chiefly in white and blue, was discovered. Unfortunately, its preservation was impossible; for it disappeared in impalpable powder soon after the air got to it. The design showed a pair of angels holding a crown over the head of a male figure.

Perranuthnoe is a little place with a big name lying close by the sea upon the Cornish coast. Its old 15th Century church is dedicated to SS. Perran and Nicholas, and is in a sorry state. A large portion of the roof has been blown about by the Atlantic gales, and green moss and lichen grow upon its granite arcades. New roofs, new floors, new windows, and new seating are required, and to do all this £1,500 is necessary. Towards that sum £750 has already been collected.

At Callington in West Cornwall, some new cemetery chapels are just finished. They are built of local granite, with snail's creep pointing and designs of Poliphant stone. The roofs are covered in with Cornish slates surmounted by a red crest. The style is a modified Early English.

Passing out of Cornwall into Devonshire, we notice that the Roman Catholic Church recently built near the railway station at Teignmouth, from the designs of Messrs. Joseph Aloysius Hansom and Son, architects, of the Broadway, Westminster, S.W., by Mr. Slocombe, builder, of Teignmouth, is being extended. Messrs. Hansom are having an additional aisle and a priest's residence carried out. The same contractor is employed, and Berry Head limestone with Ham-hill dressings are the materials used. A new monastery, at a cost of between £8,000 and £9,000, from the designs of Messrs. Goldie and Child, of 10, Kensington-square, W., is now in course of erection at Buckridge, near Teignmouth. Messrs. Stephens and Sons, of Exeter, are the contractors. The new Board Schools at Teignmouth are fast drawing towards completion. Built in the Geometrical style, they are of red brick, with dressings of Beer stone, a beautiful, white stone, used almost universally throughout the county for ecclesiastical purposes in mediæval times. These schools are being erected from the designs of Messrs. Rowell and Son, architects, of Newton Abbot, at a cost of £5,300. The contractor, Mr. Jackman, of Teignmouth, having died about nine months ago, the work has now nearly been brought to a satisfactory completion by the widow. Not a little of this success is due to the careful supervision of Mr. Thomas Gale, the excellent clerk of works. These schools will be finished within the next few weeks.

The parish church of St. Petrock at Petrockstow, mentioned passingly in former notes, bids fair to be a good church. It was generally in such a ruinous condition, that nothing short of rasing nearly the whole building—save the western tower—to the ground was open to the architect. This has been done. Petrockstow stands upon high ground, and its fine tower commands a wide range of vision. The architect engaged upon the work is Mr. John F. Gould, of Barnstaple. The northern arcade has been rebuilt, stone for stone, and some fine Perpendicular windows reinserted in their old positions. The church generally was Perpendicular, but in building the new work the architect has chosen to stamp the present restoration with a character and an individuality of its own. This has been secured successfully by keeping it Decorated in feeling. The moulds and other details in the masonry are much above the average one sees. The altar is kept well elevated by a rise of half a dozen steps. The roofs are of oak, having carved wall-plates, and bosses at the intersections. The chancel fittings will be of oak. Of the old woodwork, remains of a poppy-headed stall end still exist, a very uncommon feature in the West, where bench ends are nearly always square-headed. There is also a square, and most interesting old Norman font, with an early Jacobean cover of quaint design. Other specimens of old work of the latter date are also there, in the shape of a good altar table, and a very fair pulpit, panelled and carved and bearing the date A.D. 1626, beneath its bookboard. Mr. Grant, of Torrington, is the contractor for the restoration, and Mr. Harry Hems, of Exeter, has been intrusted with the carved work. The reopening is expected to take place in about two months' time.

Four miles from Petrockstow, (*i.e.*, Petrock's Place), is Hatherleigh.

The parish church is dedicated to St. John the Baptist. This spire is built of oak shingles, and these having become decayed, are being replaced with new oak where necessary by Mr. T. Bulleid, builder, of Hatherleigh, under the superintendence of Mr. Samuel Hooper, architect, of the same town.

A DAY WITH THE ARCHITECTURAL ASSOCIATION AT WELLS.

LAST week we drew attention to the visit this week of the Annual Excursion Party of the Architectural Association to Wells by publishing some notes upon the Cathedral and its appurtenances, with some illustrations and a plan. We do not now propose to follow the excursionists with Mr. Edmund B. Ferrey over the cathedral, on Monday last, nor with Mr. Parker and the Archæological Institute, who visited the buildings on the same day. We have already briefly referred to the chief outlines of its peculiar characteristics as a specimen of architecture, and its importance from an historical point of view. Certainly the interest and beauty of the building as a work of art cannot well be over-estimated. Mr. E. A. Freeman's lectures on the cathedral not so very long ago published by Macmillan, as well as Mr. Parker's book on the same subject, leave little to be said here, even if time and space would permit of our doing so. Suffice it to say that the Association were conducted over the cathedral by Mr. Ferrey, who pointed out the several peculiarities and details, alluding at length to those parts which were restored under the superintendence of Mr. Ferrey, senior, some few years ago. Mr. Parker, we believe, once said, while standing in the cathedral garth at Wells, "I hate restoration, but here is an example with which I have no fault to find," and we thoroughly agree with him so well has the work been done, both in an honest and conservative manner. The excursionists were entertained at luncheon by the Bishop in the dining-hall of the palace, after which the remainder of the day was spent in sketching, which, indeed, is the chief object of the excursion. Leaving Wells on Tuesday morning by three carriages, at half-past eight, Crosscombe was reached rather before nine, the distance being slightly more than three miles through "the Valley of the Cross." The village has several good examples of old stone houses, with mullioned windows, and a good old inn of 15th Century date. The village cross is hardly worth naming as an example of architecture, but the church is certainly most interesting, chiefly on account of the unusual feature in this county of a completed spire in stone, and for the fine screen, seats and bench-ends of dark oak, as well as the Cinque-cento pulpit, bearing the arms of Bishop Lake, with the date of 1616. The chancel screen is exceptionally good, some of the carved panels being suggestive to a degree, and the same may be said of the tone given to the pulpit by the spare use of gilding. The roof of the chancel is of the same date, but the earlier roof of the nave has been spoilt rather by the dark varnishing which it has undergone. The ornamentation of the pewing is very thoroughly carried out, both within as well as without the pews. The position of the chancel arch is very curious, as it is carried on corbels several feet further westward than the screen. A staircase to the old rood-loft remains, and determines the correct position of the present divisional line. Some good brass candelabra remain, that to the west bearing the date of 1707 with the name of Hugh Fortescue, and it is a good specimen. The church is mainly perpendicular, like most of the churches in this district, but the south door and nave arcades are of the decorated period. The belfry stage and parapet of the tower deserve attention, a canopy being introduced on each face of the latter in a most clever way, while the buttresses throughout the church have an unusual treatment of a splay on plan, which in the angle ones is peculiarly happy and appropriate. After the stay of an hour Shepton Mallet was next visited, and here the visitors were delighted by the quite continental character of the market-place, with its permanent stalls roofed with tiles and 16th Century market cross, and with the fine western tower of the church crowning the picturesque group of old tiled houses in the market-square. The cross has been rebuilt at a recent period, but it is an important example, built by Walter and Agness Buckland in 1500. It is hexagonal on plan, and forms a covered shelter for the market people. Its central pinnacled shaft is 51ft. high. The semi-Classical spirit of the design is interesting. The tower of the church seems to be the type copied by those who erected many of the churches of the surrounding parishes, though it in its turn is undoubtedly similar to the larger and finer specimens at Taunton. It is crowned by an incomplete spire like the towers of St. Mary, Redcliffe, and Yatton. This is covered with a leaded roof, and, as a whole is a fine composition. The only interest in the church, which was rebuilt or restored in 1827—the chancel undergoing the same process in 1851—is the magnificent wooden roof of the nave containing 350 panels, no two being similar. Unlike the roof at Crosscombe it is quite free of varnish, and is in good repair. The material is not chestnut, but oak. It is one of the very finest examples in the country. The stone pulpit is semi-Classical, but has been altered. Some good sketches were made here, and the flourishing town of "Shepun" as the natives call it, was left with regret by the whole party. A good view of the tower of Shepton, is given in Wicke's "Towers and Spires." The next halt was made two miles to the east, at Doulting, with its old barn and fine perpendicular church, which has an octagonal tower and spire at the crossing of the 13th century date. The oldest part of the church is perhaps the south transept, where an exceedingly good and rich roof is to be seen. The north door is of Norman character, having an arch of rare form for the period. The south porch, is a peculiarly florid structure of pleasing design, of Perpendicular character, and is no doubt a copy of the old one, but why so many perfect parts should have been devoted to the simple enrichment of the vicar's garden wall, we cannot conceive. The restoration is certainly a complete one, to say the least, and it was executed under the direction of Mr. Woodyer. The Barn is a most interesting example, having two transepts on either side, with massive buttresses, cusped lights, and carved finials. It belonged to the Abbots of Glastonbury, and was built in the early part of the 15th century. The cross in the churchyard is but of little interest. The building is well kept. North of the church is St. Aldhelm's Well, the source of the river Sheppy, which waters the valley to the right of the Mendip Hills and supplies the motive power of the weavers of Shepton. Continuing the journey further east, by a short drive West Cranmore was reached in time for a rural lunch in the churchyard at one o'clock. The church itself is in a very dirty condition, and contrasts in this respect strangely with East Cranmore church, passed on the road, where everything appeared so prim. This latter was rebuilt by Mr. T. H. Wyatt in 1846. West Cranmore church has but little of interest excepting the western tower, which to all intents is a small copy of that at Shepton Mallet. There is an interesting old 17th century bier in the church, and about the worst specimen of stained glass which we have ever seen in the east window. The churchyard cross deserves a sketch. Nunney after an hour's drive was reached, and here a flag was flying on the church tower, for the village was *en fête*, it being the annual field day of the village school. The church possesses but little interest beyond the rich chancel screen of Tudor times; but this was taken from a chantry chapel originally formed in the north transept, where the organ now stands, behind which some fine effigies and tombs of the Delameres are huddled together in anything but a proper way. The chancel has been rebuilt, and has two hagioscopes—one on either side—with an iron grille to each. Formerly a similar "squint" existed from the chantry chapel above referred to. The Castle of Nunney is one of the few found in Somersetshire, which was always a peaceful county. It is now simply a very picturesque ruin in a romantic position, with its own moat of stagnant green, and the stream of the Sheppy to the right, beyond which the tower of the church completes the picture. It was founded by Sir John Delamere in 1373, temp. Edward III., and finished by his nephews in the following reign. It is oblong on plan, with a cylindrical tower of bold proportions at each angle. The central portion was divided into four stages by wooden floors, but these, with the roof and private chapel formerly in the S.E. tower, have all disappeared. The marks of the siege in 1645 in Fairfax's campaign, when it was taken, remain, and bear witness to the fierceness of the attack necessary to effect a victory over so perfect a stronghold. Leaving Nunney, the last visit of the day's programme was Mells, which lies some 3½ miles west of Frome. Here the church is splendidly situated, midst old thatched almshouses and cottages in stone, and the landscape from the hill on the other side of the valley in which the village of Mells stands, is a sight well worth seeing. The church is an unrestored example of rich Perpendicular style, having a western tower of fine proportions, 100ft. high and 25ft. square on plan. It has a south porch of much beauty, with a room over and a gracefully-curved coping to the gable which is unusual, and so is the termination of the hood mould to the door. The vestry is semi-octagonal, and has a library room over; it was built by the Drapers' Company and is of Perpendicular date. The east window is a good specimen of Late Decorated, and is filled with local glass. The sanctus bell remains in the old sanctus bell-turret, but is now never used. The font is Norman, and the beautiful oak pewing of Charles the First's time throughout the entire church is as rare as it is good. We most strongly hope that the proposal which is said to have been made by the vicar to remove this pewing, will never be carried into effect; such a procedure would amount to nothing short of vandalism. The seats could easily be repaired, and possibly lowered slightly, though really the difference in height should be rather made in raising the altar, which is now miserably low and poor. The screen whch divides the chancel from the north aisle is a very good specimen, and so is the quite modern tomb beyond, where the carving is exceptionally good. The Manor-house, now used as a rectory, is an interesting building of stone, originally built in the form of an H on plan. It is in the Tudor style, but very plain. It is here that the celebrated John Horner is said to have

"Sat in the Corner,
Eating a Christmas pie."

The plum which the good boy found is recorded as having been £10,000. Mells belonged to Glastonbury, and at the dissolution was pur- by John Horner, to whose estate the living and park still belongs. After a reception of light refreshments in the old hall of the Manor-house where the "very corner" was seen, the excursionists were chartered some distance on the return journey by the vicar, the Rev. John Horner, through Mells-park, in which the present residence of the squire is situated. The Swan Hotel, at Wells, the excursionists' headquarters, was reached rather before nine, after a long but most instructive and enjoyable day. The weather was everything to be desired. Mr. James Fowler, of Louth, conducted the party, whose numbers are little less than forty. M. B. A.

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HOW TO GARNISH A COUNCIL HOUSE.

THE *Owl*, a Birmingham paper, thus prescribes for the ornamentation of public buildings—whether with any reference to the new Council House which has recently been completed in that town at a cost of many thousands of pounds we cannot say:—"First catch your Council. If there be no artists in its body, it will be the better for your purpose. Next purchase a photograph of the Paris Pantheon. Cut away the best figures from the tympanum and galvanise the residue into whatever contortions may best suit your fancy. Retain the figure of fame, as in the original, but be careful to tuck the breasts well up under the chin, and make the lower limbs in-kneed. This will add piquancy to the idea of Mother Turnerelli offering wreaths to coy and stony statesmen. See the whole of your sculpture is of the attenuated skinned-rabbit school; having all the limbs well rapped up. By these means you will avoid the robust forms, spirited action, and knowledge of anatomy necessary to flavour Italian art. This done, call upon any old established coffin-furniture maker, and he will supply you with a stock pattern pot and scroll. These you can repeat for several hundred feet round the top of your building; and if the vendor be a very old-established man, he will also supply you with a selection of venerable shields and scrolls, with which to garnish your panels, thus securing the seductive harmony of engine-turning, so dear to the Brummagem intellect. Should you wish to make a special feature of your portico, take a walk in the Black Country. You will find there, upon the chimney shelf of almost any collier's hut, a crock ornament representing a French poodle, made to do duty as a spill box. Follow this work of art studiously; but be especially careful to retain the same attitude, as the fore legs, being elongated in order to accommodate the length of a spill, would give the animal the outline of a giraffe if represented passant. For your capitals, large and small, select from the works of M. Viollet-le-Duc examples at work at the cathedrals of Chartres Rouen, Laon, &c. These ornaments, being French Gothic in style, give a spice of originality to Italian work. The whole being complete, serve up with a statement of cost such as would have secured the secured the services of the best art-workman in England—a bill over which Aguecheek might sigh once more, 'Would that I had followed the Arts!' "

A CHANNEL BRIDGE.

THE Channel tunnel, as readers of our earlier volumes will know, has always been met with a counter proposition—viz., the construction of a bridge, and we need not mention that considerable difference of opinion exists as to the relative advantages of the two schemes. A Frenchman, M. V. de Sainte Anne, conceived the design of a viaduct; but while the borings for the tunnel experiment were being made he contented himself with developing his scheme. He thinks now that there is no longer any reason for reserve on his part, since what has been done towards constructing the tunnel seems rather to have demonstrated, if not the impossibility, at least the great difficulty of carrying out that scheme. From a financial point of view he maintains that his scheme must necessarily have the preference, for he estimates that its execution will not cost more than three hundred million francs, whereas the tunnel could not be constructed for less than five hundred million francs. M. de Sainte Anne, moreover, affirms that his viaduct could be constructed in a much shorter space of time than the tunnel. The viaduct is to span the Channel from cape Grisnez to Folkestone. According to the Admiralty soundings the greatest depth of water to be found on the passage is 55 metres, and this only for a distance of some four kilometres, about half way between the Varne Rock and the French coast. This Varne Rock and its neighbour, the Calbart Reef, are destined to play an important part in the scheme. The former, situated at 15 kilometres from Folkestone, and 20 kilometres from Cape Grisnez, is some 4 kilometres broad, covered with no more than from 2 to 15 metres of water. Being of solid rock, and in a direct line with the projected viaduct, it offers itself as a natural half-way resting-place. This rock has till now constituted one of the greatest dangers to the navigation of the Channel. M. de Sainte Anne, however, proposes not only to turn it to account by using it as the foundation for a portion of the viaduct, but also, in conjunction with the Calbart Reef, for the construction of a free port in which vessels of the greatest tonnage will be able to seek shelter from the storms so frequent in the Strait which separates England from France. Both for the construction of this port and for reducing the depth of the water to 20 metres in those places where he will be obliged to construct his columns, M. de Saint Anne proposes to adopt the method employed in the construction of the Cherbourg breakwater, which consists in dropping huge masses of rock into the sea, and in consolidating them by means of Roman cement. On the foundations thus established it is intended to raise solid masses of masonry to some 40 metres above the level of the sea. This is, of course, a gigantic work, the immensity of which will be seen at a glance when it is remembered that M. de Sainte Anne does not contemplate attempting in his viaduct any span exceeding 200 metres. The distance from Folkestone to Cape Grisnez being thirty-five kilometres, it will therefore be necessary to construct at the very least 175 immense blocks of masonry, on which to place the superstructure. The details of the scheme are not yet decided upon. As to the superstructure itself, M. de Sainte Anne proposes to employ three systems. On the Varne Rock and at the two extremities where the water is shallow and the exigencies of navigation permit, he proposes to construct solid stone arches, which will have nothing to fear from the fiercest tempest. This massive masonry is to be followed by the girder-bridge system, such as is employed in the Charing-cross railway bridge. But to span the deep water he has recourse to the tubular bridge system as applied by Robert Stephenson in the erection of the Menai-bridge, and quite recently by the Americans on a much grander scale for the bridge between New York and Brooklyn. With these three systems combined, the originator of this gigantic scheme believes that he is not only certain to succeed in crossing the Channel, but also in satisfying the demands of every government concerning the precautions to be taken to prevent the navigation of the English Channel being rendered even more dangerous than it is at present. M. de Sainte Anne promises, however, to commence operations without delay. He informs us that he will not require more than six or seven months for the scientific experiments and the thorough elaboration of his project, and that a sum of one million francs will suffice to pay the preliminary expenses. To raise these funds he has already laid his project before the Chambers of Commerce of France and Belgium, from 84 of which he has already received adhesions. M. de Sainte Anne wishing to give England the option of participating in the honour attached to the achievement of his project, intends shortly to visit this country in order to lay the matter before the Government, and to submit his plan to the technical societies.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Birmingham.—Midland Institute (Archæological Section).—The two days' excursion of this Society, yesterday and to-day, seems likely to be one of considerable interest. The places to be visited are Peterborough and Stamford. At Peterborough the Dean has kindly promised to join the party. Stamford is full of archæological interest, the six churches alone forming no ordinary collection of architectural beauties. The Mayor of Stamford has undertaken to exhibit to the visitors the ancient regalia of the borough, and other objects of antiquarian interest. Later, Burghley House, built by the Lord Burghley, treasurer to Queen Elizabeth, and now the seat of the Marquis of Exeter, will be visited; and as the collection of pictures—some 500 in number—includes some of the best specimens of the old masters, this, in addition to the grounds and park in which the mansion stands, will more than suffice to occupy the time at disposal.

Kent Archæological Society.—On Wednesday and Thursday, the 30th and 31st ult., the annual excursion began at Ham-street station at ten o'clock in the morning. A drive of about twenty-five miles, with frequent halts, to inspect churches and other buildings, was made. Papers and speeches were read at night at New Romney. The second day's excursion was from Appledore station to Appledore again. The annual meeting took place at the first halt on Wednesday, in the drawing-room of the new Orleston Rectory. Earl Amherst took the chair, and the Rev. W. A. S. Robertson, the honorary secretary, read the annual report and managed the form of business. Sir Walter Stirling's speech on the report called attention to the number of excursionists—about 200. A paper by the Bishop of Dover dealt with the history of Romney Marsh from Roman times. Nine churches altogether were visited in the two days. The temporary museum at New Romney was brought together in the Assembly Room, arranged by Mr. Walker, the mayor of the town, who also lent a large number of objects. The collection comprised early printed books, illuminated manuscripts, costumes, archives, regalia, tapestry, needlework, brasses, and Mr. James Neale's *fac similes* of the recently discovered Canterbury paintings. The papers on the origin of the name of Romney, on the town and port, and on the municipal records, carried on the evening till it was too late to read the paper prepared by Mr. Scott Robertson on the Lost Churches of New Romney.

PARLIAMENTARY NOTES.

Water Supply of London.—On Wednesday, in the House of Commons, Mr. Fawcett moved that the water supply of London, was a subject which ought, without further delay, to be dealt with by the Government. The hon. member urged that, as water affected health, the moral condition of the community, and the safety of life and property, it was the duty of the Legislature to see that its quality was good, the supply and the mode of supply sufficient and efficient, and the price reasonable. The water companies had failed in these particulars and the inteference of Parliament was urgently required. Mr. Sclater-Booth stated that the subject was receiving the attentive consideration of the Government. Mr· Cross said that during the recess the Government would consider by what means the powers now possessed by the water companies might be acquired by some authority to be appointed practically by the Government. The right hon. gentleman also declared that the Government would not recognise any speculative claims on the part of the companies. The resolution was ultimately withdrawn.

Building Intelligence.

Altcar.—The new Church of St. Michael, which has just been erected at Altcar, was consecrated on Wednesday. The new building is erected a little to the north of the former one, the churchyard being enlarged. As there is a tradition that previous to the erection of the 18th century building of brick an ancient church existed on this site, constructed in the timber "black and white" style so prevalent in Lancashire, it was thought desirable to follow this ancient precedent in the new building. It has accordingly been erected of solid oak framing, filled in with brick nogging, and cemented between the timbers both externally and internally, the external face of cement being whitened. The fittings are entirely in oak. The floors are paved with red tiles. A reredos, composed of hand-painted tiles, has been designed, and inserted in the three panels under the east window, the centre representing our Lord and the two disciples at Emmaus, and the side ones containing the figures of St. Michael, militant and triumphant. By the sides are two panels painted by Messrs. Heaton, Butler, and Bayne, who also supplied the designs for tiles in reredos. The church is seated to accommodate 208 persons, and is heated by "Truswell's" hot-air system. Mr. Thomas Epsley, of Eccleshall, was the contractor; Mr. Allan Lloyd being the clerk of works, and the architect was Mr. John Douglas, Chester.

Calverhall.—The parish church of The Corra Village, Calverhall, Shropshire, was reopened on Wednesday week after restoration. The works include a new nave, a south aisle, and a tower, and the work has been performed by Messrs. W. Powell and Co., of Prees, from the plans of W. Eden Nessfield, Esq., London. The chancel and transepts, which formed part of the original edifice, and remain intact, are of the Gothic or Early Decorated type. The new nave and tower, replacing the previous nave, are in the 15th century Gothic or Perpendicular style of architecture, and at the west end of the nave is a noble window, bearing all the characteristics of the latter type. The roof is open and oak-timbered, with angels carved on the crossbeams. The seats are of oak, and will accommodate 150 people. The whole of the carved work was executed by Mr. Forsyth, of London.

Dartington.—Dartington Church, dedicated to St. Mary, some mile or two from Totnes, has been entirely taken down, and a new one is being erected some half-mile away from the old site.. Designs for the new edifice having been obtained from Mr. John Loughborough Pearson, F.S.A., the contract was taken by Mr. Jonathan Marshall, builder, of Plymouth, and is now well advanced. In taking down the old church much of the more perfect materials have been retained, the window tracery, the granite copings, the nave and chancel arcades, the roof and other parts, and all the old work is being re-used in the sacred edifice. This latter is in the Perpendicular style of Gothic architecture, and consists of naves, aisle, chancel, a north-east vestry, and a western tower. The walls are of local limestone; the dressings of Bath stone. In an exterior niche, over the eastern window will be a sculptured figure of the patron saint, the Virgin Mary. The principal entrance to the church is the south-west porch, which has a stone-groined roof. The carved work and the sculptures have been intrusted to Mr. Harry Hems, of Exeter. The works will, probably, be complete by the end of the year. Mr. J. Babb is the clerk of works in charge, as representative of Mr. Pearson.

Ellesmere.—The foundation-stone of the new Church of England Lower Middle Class

School, at Ellesmere, was laid on Tuesday week. The new school will be dedicated to St. Oswald. The work already done includes the foundations and portions of the substructure of the hall with its offices, the central building, and a portion of the southern side. It is intended to proceed with the superstructure of these buildings as soon as possible. The style will be a very simple treatment of Gothic; the material will be local red brick, with dressings of Cefn or other stone, covered with roofing of slate. The foundations of a portion of the building have been executed by Messrs. W. Bowdler and Co., of Shrewsbury, from the designs of the college architects, Mr. R. Herbert Carpenter, and Mr. B. Ingelow, of Carlton Chambers, London; Mr. Garland acting as clerk of works. The school will contain a chapel, schoolrooms, classrooms, master's house and offices, and is to be completed for a sum not exceeding £50,000. The first portion to be built will require £20,000. This sum will erect dormitories, classrooms, and master's rooms for 200 boys, with the hall, under-hall, kitchen, and offices for 500.

Erdington. — The foundation-stone of the first portion of St. Thomas's Priory, a new monastery in course of erection at Erdington, near Birmingham, for the Fathers of the Order of St. Benedict, was laid on Tuesday afternoon, the 5th inst., by the prior, the Rev. Hildebrand de Hemptinné. The new priory will be built of Kenilworth stone, on a site adjoining the beautiful Roman Catholic church of SS. Thomas and Edmund, with which there will be a communication by a cloister, and, when finished, will form a complete group of ecclesiastical buildings of the old Monastic type. The plans have been prepared by Mr. A. E. Dempster, architect and surveyor, of 19, Bennett-hill, Birmingham, under whose superintendence the work is being carried out by the contractor, Mr. J. Garlick, of Saltley Works.

Hockley Heath.—Last week the foundation-stone was laid of a new church, to be dedicated to St. Thomas, at Nuthurst, Hockley Heath, near Knowle. The structure comprises a nave, with south porch; chancel, with organ-chamber and choir vestry also on the south side, beneath which the heating chamber is situated; a tower, in the lower part of which is the clergy vestry, with separate entrance, rises, crowned with a belfry and spire at the angle of the nave and chancel on the north side. The building will be built chiefly of red brick, with graystone and moulded-brick dressings, the interior of the walls being lined with buff pressed bricks throughout. The nave roof will be covered with brown Broseley tiles, and divided internally into four bays, with principal timbers and raftering exposed, but plastered and coloured between. The roof of the chancel will also be open-timbered, the seating of red deal, stained and varnished. Accommodation will be provided for a total of 202 persons. The church is designed in an Early Gothic type, the side lights being lancet-shaped, but with cusped heads. A bold circular window fills the west gable, and a traceried centre window, with lancet-shaped side windows, occupies the front gable, which, with the tower and spire, will form a conspicuous feature from the road. Messrs. Barnsley and Son, of Birmingham, have taken the contract at the sum of £2,123. The architect is Mr. John Cotton, of 15, Temple-row, Birmingham.

Kilkeel.—The new Roman Catholic Church at Kilkeel, Co. Down, was consecrated on Sunday week. This church is 114ft. in length, and 96ft. in breadth across the transepts, and 33ft. across the nave, while the height to the apex of the roof is 44ft. The tower, when finished, will be 125ft. in height. The walls are built of finely-chiselled granite, and the dressings are of the material. The building is Gothic in style and has been erected from the design of Mr. John O'Neill, and subsequently under the superintendence of Messrs. O'Neill and Byrne. The contractor was Mr. M'Culloch, of Armagh.

Metropolitan Board of Works.—At this Board, on Friday, contracts were signed with Messrs. Aspinall and Son for paving and other works in connection with the Angel improvement at Islington, and with Mr. Turner for reforming, maintaining, cleansing, and watering carriageways on the Victoria Embankment. Drawings submitted by the Lewisham and Plumstead District Boards of a bridge proposed to be constructed over the river Quaggy were approved, and it was decided to contribute one-half of the cost, amounting to £300 of the same. It was agreed to contribute £2,550, being half the estimated aggregate cost of the construction of a new bridge over the river Lea, at Temple Mills, and of improvements to the two bridges passing over the Hackney Cut. It was also decided to contribute one-half the cost of improvements in King's-road, Chelsea; North End-road, Fulham; Glenthorne-road, Hammersmith; and Bermondsey-street. The Works Committee reported on a letter from Mr P. de Keyser, Royal Hotel, Blackfriars, stating that he is anxious for the removal of the hoarding so long maintained in front of his premises, and will be happy to sign any request for that purpose; it was decided that, in the event of a satisfactory arrangement being come to with Mr. de Keyser's solicitor, the necessary works be executed by Mr. Webster.

Painswick.—Painswick parish church was re-opened on Wednesday week after restoration. An unsightly old gallery has been removed; the high-backed pews have been replaced by benches, the floors have been relaid with Minton's tiles, the organ which stood in the gallery now removed has been placed in the Lady chapel; the tower has been raised a stage and a new approach has been made; the roof has been releaded, and other works of reparation carried out. The total cost has been about £1,300, and another £300 is required to supply a warming apparatus and other necessaries. Messrs. Waller and Sons, of Gloucester were the architects, and Messrs. Gyde and Cox, of Pitchcombe, were the contractors.

Tewkesbury Abbey.—The time for the re-opening of this noble church has been fixed for September 23rd, and in addition to the opening services on that day it is proposed to hold special services during the seven following days. Arrangements are being entered into with the railway companies with a view to the convenience of visitors from a distance, and particulars will shortly be published as to hotel accommodation, private lodging, luncheons, and reading and writing rooms, and other matters whereby the comfort of those who may be drawn to the old town, may be insured. We are asked to say that funds are urgently needed to complete the restoration work.

CHIPS.

A new church and vicarage house are in course of erection in Heythrop-park, Oxfordshire, for Albert Brassey, Esq., at a cost of about £10,000. Mr. A. W. Blomfield, M.A., of Montague-street, London, is the architect, and the work has been intrusted to Mr. Alfred Groves, Milton-under-Wychwood, Oxon.

A new public school has been opened at Pollokshields. The school will accommodate 800 scholars—boys and girls—and the cost is ascertained to be about £6,000. The buildings have been erected from the plans of Messrs. H. and D. Barclay, of 136, Wellington-street, Glasgow.

On Wednesday week the Archbishop of York consecrated, at Sproxton, near Helmsley, a new church dedicated to St. Chad. The church is built from the designs of the late Sir Gilbert Scott, who utilised much of the old material of a pre-existing church. The church consists of nave and chancel simply, the line of demarcation between the two being one single raised step. The church will accommodate nearly one hundred worshippers. The total cost, it is anticipated, will be about £800.

The Rev. George Lambe, of Plymouth, who possesses considerable property in the neighbourhood of St. Austell, has offered to supply the whole of the granite for the building of Truro cathedral, and Mr. Pearson, the architect, is said to have approved of the stone. The gift will be worth some thousands of pounds.

Sawley Church, York, was consecrated on Wednesday week. The church, which is dedicated to St. Michael and All Angels, has been rebuilt upon its old site, with slight extensions, so as not to interfere with any interments. It consists of chancel, nave, vestry on the north side, and porch on the south. The new church is of the Early Decorated style, built of local stone, covered with green slates, with a half-timbered front, the nave fittings are in pine, the pulpit and chancel fittings are of oak. The reredos and stonework of the pulpit are of Studley limestone. The total cost of the church has been a little over £2,000. Mr. Birchall, of Leeds, has been the architect, and Mr. Grainge, of Otley, the contractor.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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J. W. B. (We should say roughly that a rood 40 perches) of common masonry of the thickness you mention would require nearly 3,000 bushels of lime. Rubble masonry requires per cubic yard about 9 cubic feet of mortar. "Puzzuolano" is a material used for conferring hydraulic properties on lime. The natural puzzuolano is a substance of volcanic origin, and is found at Pozzuoli, in Italy. The artificial P. is made from earths containing a large percentage of clay and calcined.)

Correspondence.

ORNAMENTATION OF NAVE COLUMNS AT WALTHAM AND DURHAM, &c.

To the Editor of the Building News.

Sir,—Following up the letter of "J. H. M." in your issue of August 8th, permit me to mention the Church of St. Lawrence, Pittington, a village about four miles from the city of Durham, where the north arcade of the nave has columns alternately octagonal and circular. The former are ornamented by vertical rolls and flutes cut into the shafts, and the latter by spiral cable mouldings projecting from them. The whole arcade (of six arches) is on a small scale, the columns 8ft. high and 8ft. apart. It is apparent that the idea was taken from the neighbouring cathedral, but it is worked out with the difference and peculiarity that the spirals project from the columns instead of being sunk into them, as at Durham, &c.—I am, &c., J. Oswald.

Newcastle-on-Tyne, August 12.

GLOUCESTER LUNATIC ASYLUM COMPETITION.

Sir,—We understand that the premiums have been awarded:—

1st to "Experience."
2nd to "By Sunshine all Day."

The competition appears to have hinged on the general arrangement of the main corridor of communication, the premiated designs being both planned with V-shaped corridors, to which the blocks are attached. The advantages of this arrangement appear very slight.

"Experience" has violated the "Suggestions and Instructions" issued by the Commissioners in Lunacy (and to which document competitors were specially directed by the "Instructions to Competitors" issued by the Asylum Committee) in the matter of "Entrances."

The Commissioners say "Roads of approach or public entrances on the SOUTH side of the asylum should as far as possible be avoided. The general entrance, the porter's room, the reception and visitors' rooms, the committee-room, the clerk and steward's office . . . . should be placed on the NORTH side of the building," the object being that the patients shall not be excited by outside influences. This is altogether ignored by "Experience," who has placed the whole of the above-named offices in the centre of the SOUTH front.

The "Infirmary" block is planned on the old "Gallery" plan, by which the patients in single rooms are subject to disturbance from the noise and traffic going on in the ward corridor.

The "Epileptic" and "Chronic" day-rooms have no end lights, hence one of the advantages to be derived from the "echelon" arrangement, viz., that patients shall get an extended view, and sunlight early and late, is nullified.

The single rooms are placed in the noisiest part of the block, viz., in passage (which is very narrow) leading from day-room to convenience court and airing yard, and over neither of which has the attendant—from his room—any control.

Apparently the attractive motto, "Sunshine all Day" (query, how would they have been off this year?) has had much to do in securing its author second place; the plan is full of grave defects.

The general treatment of the "Infirmary" block is similar to that of "Experience." The "Epileptic" and "Chronic" ground-floor plans are open to the objections that they have no "through" ventilation; one day-room has light only from the south; the wards approached one from the other; the attendants' rooms have no control over the single rooms, yard-entrances, or convenience-courts, and the sculleries have no external light or ventilation, and would, of course, be unhealthy to a degree.

From these remarks I think it will be seen that the premiums have not been awarded to perfect plans.

Any further comments would be superfluous from AN UNSUCCESSFUL COMPETITOR.

Gloucester, Aug. 13.

ARCHITECTURAL CADGERS.

SIR,—As a matter of interest to the profession in general and competing architects in particular, and with a faint hope that some good may result from publication, I inclose you copies of some letters (suppressing names) recently received in answer to an advertisement which appeared in your paper inviting applications from architects who would be willing to compete for a small mission church.

No wonder building committees and others hold the whole body of architects in light estimation (as not without reason is sometimes urged) if they are accustomed to be addressed in this way by individual members of the profession and those claiming to belong to its representative institution.

Observe, Sir, in the first letter subjoined, the delightful expedient that a member of the Institute has recourse to in order to steal a march upon and underbid his professional brethren in respect of fees, without infringing (as he seems to think) those rules of practice which he holds, evidently, in such veneration and respect; and mark the effusive liberality of the various writers when an opportunity such as this ("the cause") as one calls it, comes under their notice.

I inclose my card.—I am, &c.,

7th August. W. H. P.

[COPIES OF LETTERS REFERRED TO.]

No. 1.

REVEREND SIR,—I shall be pleased to compete for the Mission Church you purpose building.

As a member of the Institute, I am debarred from accepting a less commission than 5 per cent.; but I shall be happy, in the event of you placing the work in my hands, of returning (*sic*) half the commission as a donation to the funds.—I am, yours obediently, . . .

No. 2.

DEAR SIR,—I shall be very happy to give my services as architect to your Mission Church free of all charge, and to prepare you plans and superintend the works from beginning to end if you will accept same, and it will save you putting the matter out to competition.

I am sure you have no money to spare for the services of an architect from what I know of mission work. Please accept this offer in the good spirit it is offered by me.

I have had great experience in church and other buildings, and have erected mission churches before.

I might mention I am Gold Medallist in Architecture at the Royal Academy of Arts, London.—I am, dear Sir, yours sincerely, . . .

No. 3.

DEAR SIR,—If you will kindly favour me with particulars of your requirements I shall be pleased to submit a design for your Mission Church in competition with others, as advertised in the *Builder*.

Feeling an interest in mission work generally, I will make this further offer, viz., that I will submit a plan for your approval, and should you feel disposed to carry it out, I will make a present of the design to the cause. You might then employ some *reliable* builder to execute the work *without supervision*, or I would offer my services as architect at a commission of 2½ per cent. (half the usual charge), travelling expenses to be charged extra.

Should you disapprove my scheme, you might return the plans to me, and you would be no worse off than before.

As you have virtually advertised a competition, I do not press my offer, but leave it entirely to your discretion. I make the offer, however, in all good faith (though a dissenter), and assure you it will give me very great pleasure to provide the plans and all necessary working drawings and specification entirely free of charge.

Trusting, as a fellow Christian, you will not think it impertinent of a stranger—yet would-be friend—to make such a proposal,—I am, Sir, yours faithfully, . . .

No. 4.

DEAR SIR,—Having seen from the BUILDING NEWS that you are desirous of receiving competition drawings for a Mission Church, and knowing what I do of the unsatisfactory result to all parties concerned of this method of obtaining designs, I thought there would be no harm in offering my professional services.

I am a young, though practical and experienced, architect, partner in a rising West-End firm, and we are now carrying out several works of the nature you seem to require, and which, being of a charitable one, we are erecting at the reduced commission of 2½ per cent. on the total outlay.

If, therefore, you should feel disposed to do me the favour of accepting my offer, I should be happy to get out from 3 to 6 designs for you to select from, and everything coming under our supervision receives our personal and greatest attention.

I may mention that, amongst other clergymen and Dissenting ministers, we are well known to the following, though I should not like them to be written to until you should have decided upon what course to take, and have received your favourable acceptance of our offer, the competition being countermanded, which could easily be done.

Trusting you will excuse this letter, and apologising for it from the fact that work must be sought,—I remain, dear Sir, faithfully yours, . . .

(List of references following.)

THE NEW ROAD AND PROMENADE, RAMSGATE.

SIR,—Though our letter of the 28th ult. appears to have set Mr. V. Green right on several points, the letter which appears in your last issue over his name still requires notice from those interested in the awards of competitions. We would, therefore, direct your attention to the fact that Mr. Green seems to ignore his competition drawings all through the discussion, and for some reason or other constantly falls back upon his model, which is entirely outside the question, as it is obvious that that we or any other competitor might have any number of models or alternative schemes in reserve, if we wished to indulge in a similar absence of the spirit of fair play; and evinced the same desire of proving that whatever scheme may be ultimately adopted is in reality based upon some proposition made by us. He, however, now states that the matter has been referred to the Board of Trade for decision, and they have resolved that the New-road shall not extend beyond the base line of the cliff along the Military-road, rendering the question of columns a matter of small consideration. We agree with him that it does so if the columns were to be erected as proposed by him, where the stone posts now stand at the edge of the Military road. But such decision is strictly consistent with our design, as the bases of our columns would be fixed in a uniform curved line, following the general direction of the base of the cliff, for a portion of its length, avoiding all interference with the Military Road; and as our plans show, enabling us to secure a good read with the least destruction of property, there being no necessity to destroy any houses to the west of Farley Place. Mr. Green, in his anxiety to parade Mr. Forbes and the railway company before your readers, appears to forget that the competition was invited, not by the company and in their interest, but by the Corporation of Ramsgate, *presumably* in the interests of the town, and at the expense of the ratepayers. We, therefore, in common with your other correspondents, cannot conceive why the premiums were awarded to schemes of such an expensive character, to the exclusion of others which meet the requirements of the town to a greater extent, and at from ½ to ¾ths of the outlay. One explanation is, that Mr. Abernethy could not possibly have examined and reported upon the sixty-four sets of designs and estimates, &c., with sufficient care in the limited period of one week. And for our part, doubtless also with other competitors, if we had known that an engineer interested in the railway company was to be selected to adjudicate upon the designs, we should not have taken part in the competition.

As regards Mr. Green's suggestive remark concerning the chairman of the local board, we do not see what that has to do with the present controversy, as it is a matter which concerns the town, and not the competitors. And nothwithstanding Mr. Green's remarks as to our doubtful minds, we may be permitted to express yet another doubt by considering that the Improvement Commissioners do not yet appear to have arrived at any definite result, as they have not yet intimated their decision or returned the drawings.—We are, &c.,

VIA MELIOR, ITER BREVIUS.

London, August 13th, 1879.

[We can insert no more letters on this subject.—ED. B. N.]

W.C.'s IN BATH-ROOMS.

SIR,—I have read the letter from Messrs. Keen and Son, at page 171. We are led to understand that "if the w.c. is a common one" it cannot be fitted up to give satisfaction. Now *I* do not see any difficulty in the matter. Messrs. Keen and Son say they are going to fit up one of their w.c.'s—an *uncommon* one, I suppose—at the Sanitary Congress; but as the heading of their letter is "W.C.'s in Bath-Rooms" this, it seems to me, refers more to the *arrangement of the pipes*, hence I would suggest that, for the information of all interested, Messrs. Keen and Son need not hide their light under a bushel until the Sanitary Congress meets, but rather let them *at once* in your columns give us a drawing showing how to fit up, connect, and ventilate the soil and waste pipes properly with w.c. in the bath-room. If they can show anything in advance of what has already appeared in your pages they will deserve credit for it.—I am, &c.,

W. P. BUCHAN, Sanitary Engineer.

Glasgow, August 9th.

FARM PLANS AT KILBURN.

SIR,—With many others I was much disappointed at Kilburn by the closing of the shed in which these plans were placed during the early days of the show, when there was little crush of people and anyone could have examined them at leisure.

My object in writing now is to suggest that some attempt should be made to have these plans down in the farming districts where farmers and surveyors can get a look at them, as there must surely be some merit in them. Could not the R.A.S. be prevailed upon to allow them to be exhibited, say, in the county town museums of the great farming counties Shropshire, Lincolnshire, &c., or some such public building? There was so much stock to be seen at Kilburn, and so much mud to be travelled through, that few had an opportunity of studying the plans after they were unlocked.—I am, &c.,

PROGRESS.

CHIPS.

The parish church of Muckton, near Louth, was recently reopened, after restoration, under the superintendence of Mr. James Fowler, of Louth. Mr. Maxey was the contractor.

In order to afford a new water supply for the watering-place of Littlehampton, two wells and a series of adits and driftings are being excavated for the town authorities by Mr. James Dixon, contractor, of Swansea. Both wells are of 6ft. diameter, and have been carried down of this size for 60ft. At 20ft. deeper the tunnels, each 6ft. by 8ft. 6in. will probably be formed, and 9in. bores continued till a sufficient supply is obtained.

A new schoolroom has just been opened at Miller's Dale, near Buxton. A Sheffield journal says it has been built from the designs of the Rev. S. Andrew, vicar of Tideswell; the style is Early Perpendicular, and the cost has been £500.

Intercommunication.

QUESTIONS.

[5863.]—**Baths.**—I have some plunge and private baths to construct. Would any of your readers inform me of the best means of making the plunge baths watertight, and also the cheapest and best means of supplying hot and cold water to plunge and private baths? References to good baths in progress or in existence would oblige.—Arkeo.

[5864.]—**Partitions.**—Could some reader of the Building News give information as to partitions? What I want to know is, is there any light material known which could be substituted for lath-and-plaster partitions, which are very objectionable in many respects, 1st, on account of sound, 2nd, on account of mice getting into them. Is there any solid *light material* fit for the purpose that will take plaster finish?—G. P. B., Dublin.

[5865.]—**Mouldings.**—I should be glad if any of my fellow readers of the Building News would inform me of a good book on ancient and modern mouldings, suitable for drawing and dining-room ceilings, &c.—C. E.

[5866.]—**The Velocity of Sewers and Friction of Bends.**—Will any reader kindly exemplify the formulæ for the velocity of sewers and friction of bends as used in Latham's "Sanitary Engineer"?—V. S.

[5867.]—**Water-Colour Painting.**—Can any reader recommend a rudimentary book on this subject, one commencing with the laying on of flat washes, and with a few easy landscapes in it, with directions what colours to mix to produce the tints of the copies?—A Dummy.

[5868.]—**Sketching Tour in the Isle of Wight.**—I am about to spend my holidays in the Isle of Wight. Will anybody tell me what sketching there is worth doing there?—Peter.

REPLIES.

[5787.]—**Strains on Collar Beam Roofs.**—"B. S." ignores the original ground he took up—namely, that a collar in the roof without a tie-beam mentioned by "S." was not as I said it was in tension when replying to "S.," and such has been proved to be in tension, and therefore "B. S." was wrong on that point. I asked "B. S." to calculate his thrusts under stated conditions, and he has failed to comply. Now will he be good enough, if he can, in addition, to give us an example as to how he finds the horizontal pressure required if applied at the top to overturn a given length of wall of a given thickness and height, and if he should make any mistake I will, if possible, put him right, when he will at any rate have gained something out of the discussion. I can state that some of "B. S.'s" information in his last letter, with respect to thrusts, &c., are mechanically erroneous. Will he, therefore, show also how or by what means he discovers or knows what thrusts his rafters exert? He can learn from my first paper, if he is not already aware, how to find them; but should not accuse me of not knowing what I was writing about, as "S." did directly I had instructed him. As to what "B. S." says about a roof which pushed out the walls, there would no doubt be many such failures if mere practical men from the shops (which "B. S." gives us to understand are the cradles of knowledge), were to be intrusted with much construction. I have known an instance of a first-rate foreman of joiners in a large shop being in fear lest the walls of his shop should fall through the jarring of the machinery, and I was astonished to discover that he did not know even the names nor the functions of the timbers in the roof trusses over his own shop, he not being an experienced carpenter but a joiner only, so far as practice was concerned. I must inform "B. S." that his example from Vitruvius being an obsolete kind of roof, and with principals and purlins, &c., does not come within the meaning of the original question (5787), not being "an ordinary span roof." Has "B. S." yet read the twentieth book of Euclid? I read the same some 15 years since in a week, and it tended to clear my head, and I could conscientiously recommend it.—Henry Ambrose

[5803.]—**Proportion in Church Architecture.**—In fulfilment of my promise I now submit a "scale of harmonic angles." I wish also to correct the angle given for outer corner of inner buttresses—it should be one-ninth. Top of pinnacles one-twelfth above apex of gable. In testing proportions for the colonnade of a Hexastyle Grecian Doric Temple it will be found that an angle of two-sevenths may be used to determine height of lower edge of architrave. The intercolumniations nearest the corners being one-seventh, the next may be determined by the angle of three-twentieths, while the centre opening will require to be at an angle of one-sixth, seeing that if the columns were at equal distances apart, the centre opening would appear to be the least. Angles for columns taken to top of shaft below annulet. Ditto for spaces to the same height.

ANGLES.

1	$\frac{8}{9}$	$\frac{4}{5}$	$\frac{3}{4}$	$\frac{2}{3}$	$\frac{4}{7}$	$\frac{8}{15}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{4}{9}$	$\frac{2}{5}$	$\frac{3}{8}$	$\frac{1}{3}$	$\frac{2}{7}$	$\frac{4}{15}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{2}{9}$	$\frac{1}{5}$	$\frac{3}{16}$	$\frac{1}{6}$	$\frac{1}{7}$	$\frac{2}{15}$	$\frac{1}{8}$

—G. M.

[5856.]—**Styles of Architecture**—"Paddington" had better consult Fergusson's "Handbook of Modern Architecture" for the mixed styles, such as the Elizabethan, Jacobean, &c. The fact is there is no reliable authority yet that treats exclusively of these periods—the history has yet to be written. The best advice I can give is to study examples of each period—not difficult to do, as there are numerous buildings to be found in the Elizabethan and Jacobean styles little tampered with. I would suggest the counties of Wilts, Lincoln, Suffolk, Kent, and Essex for examples of the former, whereas Jacobean and Queen Anne may be well studied in every county where old brick buildings of the last and preceding century abound.—G. H. G.

[5857.]—**Oil Paint Blistering.**—The blistering of oil paint, alluded to by "R. Q. H.," is primarily due to the expansion of the linseed oil in the paint during oxidation. This expansion is caused by the absorption of oxygen from the atmosphere, and is accompanied by an increase in the weight of the oil. In an experiment made with about 1,000 tons of boiled linseed oil I found the increase of weight to be about 11 per cent. At the same time volatile products are given off in considerable quantity, so that the total amount of oxygen absorbed must be considerably above 11 per cent. Owing to this expansion of the oil, the film of paint is in a continual state of tension, and would inevitably blister or wrinkle were it not restrained from doing so by its adhesion to the substance to which it has been applied. There are two chief causes which diminish this adhesion in the case of wood, to which I presume "R. Q. H." chiefly alludes. The first is that wood, especially if at all new, often contains a considerable amount of moisture, even when apparently dry. Paint applied to such a surface soon forms an impermeable film, with but little adhesion to the wood, and a very slight increase of temperature is then sufficient to evaporate the moisture contained in the wood, causing a pressure sufficient to raise the paint. Where the wood has been previously heated for the removal of old paint and the fresh coat is immediately applied, blistering rarely occurs. The second cause of blistering is the defective composition of the "priming," or first coat of paint. Some painters seem to think anything good enough for a first coat, and are especially desirous that it should dry quickly. It is a well-known fact that some inferior kinds of linseed oil have a tendency to become "fatty" or non-drying, especially in the summer. Such oils, if used for priming, must produce very bad results. In order to hasten the drying of the first coat of paint an excess of driers is frequently added. These driers usually consist of litharge, to which red lead is often added. Now linseed oil forms with an excess of litharge a compound which is of the consistence of soap at an ordinary temperature, but becomes soft at a heat such as may be produced by the sun shining upon it. If the priming softens, the tendency of the upper film to expand overcomes the adhesion, and the paint blisters or wrinkles. I have found by numerous experiments that good paint will not blister at all if laid on a film of oxidised linseed oil without dryers. Although the above remarks do not explain the difference between the painting of now and of 40 years ago, perhaps "R. Q. H." will find that the haste to finish off houses which characterises modern building operations induces painters to paint on damp wood, or to use an excess of driers in the first coat.—Walter T. Reid.

[5858]—**Brewery Floor.**—Captain Douglas Galton, C.B., F.R.S., Director of Public Works and Buildings, at the meeting of the Royal Institute of British Architects, held on Monday, Jan. 12, 1874, recommended that the "basement of a house should be entirely cut off from the surrounding soil by a continuous bed of asphalte laid over the whole surface covered by the house, and a damp-proof course should be laid below the level of the floor." The following also is taken from "the appendix to the report of the commissioners on the fine arts":—"In 1839 I superintended the construction of a house of 3 stories on the Lac d'Enghien. The foundation of the building is constantly in water, about 9½in. below the level of the ground floor. The entire horizontal surface of the external and internal walls was covered at the level of the internal ground floor with a layer of Seyssel asphalte, half an inch thick, over which coarse sand was spread. Since the above date no trace of damp has shown itself round the walls of the lower story, which are for the most part painted in oil of a grey stone colour. It is well known that the least moisture produces round spots, darker or lighter, on walls so painted; yet the pavement of the floor, resting on the soil itself, is only about 2½in. above the external surface of the wall, and only 19½in. at the utmost, above that of the sheet of water. The layer of asphalte having been broken and removed for the purpose of inserting the sills of two doors, spots indicating the presence of damp have been since remarked at the base of the door posts." "W. L. N." may write to Mr. Farrell, the secretary of Claridge's Asphalte Co., for further particulars. Their advertisement appears in your pages.—Brewers' Surveyor.

[5859.]—**Purlins.**—In reply to "S.," purlins set as he has shown them in Fig. 2 had best be considered under two separate heads. 1st. Suppose them to be thin and deep like flooring joists, then the rafters would tend to bend them laterally, which would not be the case if their top side were inclined to the pitch of the roof plane when they would oppose their full strength to the weight upon them. Supposing them to be nearly square in section, which is the best disposition of material, then it is also the best to incline the top side of the purlin to the pitch of the roof for three reasons—1st, because it is more convenient to notch them on to the backs of the principals, and in fact on the other system it would be nearly impossible to do so with any sense. 2ndly. It will make better notching for the rafters and operate as in the case with thinner purlins, and, 3rdly, a purlin nearly square, and with its top side inclined to the roof pitch would generally have its highest and lowest arrises nearly or quite vertical the one to the other, and in such a position would offer much greater resistance to vertical pressure and also to horizontal pressure than would be the case if the top side were level. In the majority of cases I should consider the pressure would be vertical and due to the tendency of the rafters to sag except at the ridge and walls.—Henry Ambrose.

[5859.]—**Purlins.**—The principal reason, I take it, why purlins are generally placed at right angles to the rafters is that carpenters prefer to frame their pieces on the square. Mechanically, I can see no great advantage in the plan as regards strength; indeed, I think the plan of placing them vertically as in Fig. 2 is more in accordance with the actual conditions of the roof load, which, of course, acts vertically. I can conceive of no other reason to give "S." than the above.—G. H. G.

[5862.]—**A Contractor in a Fix.**—I have read "Country Builder's" dilemma, and can give him my experience. He should have made the architect give him a written order for the alteration to the labour on reveals and quoins before he commenced the work, and, in fact, for all extra work. In the absence of this the architect may turn round and say that his intentions only have been carried out, and that you acquiesced in the alteration. If, however, the architect is a gentleman — a man of honour (and the initials "A.R.I.B.A." have nothing to do with this), he would at once accede to the measuring up of all "extras." You can, of course, demand it if the contract agreement is not against you.—G. H. G.

WATER SUPPLY AND SANITARY MATTERS.

Bury.—Local Government Board Inquiry.—The Town Council of the borough of Bury having made application to be allowed to borrow the sum of £40,000 for sewerage purposes, John Thornhill Harrison, Esq., C.E., attended at the Council Chamber in Bury on Friday, the 25th July, to investigate the matter. Mr. F. Bull, town-clerk, opened the inquiry, pointing out the present powers and liabilities of the Town Council with respect to borrowed moneys, stating that all sewers must be constructed from moneys raised by the sewer-rate, which at the present time was 6d. in the pound; and upon the present rateable value, £214,651, would produce a sum sufficient, after paying for repairs of sewers, to repay principal with interest of the sum proposed to be borrowed, paying off the whole in thirty years. Mr. J. Cartwright, C.E.; the borough surveyor, explained the plans, copies of which had been deposited with the Local Government Board, and described the scheme upon which the present application had been made as consisting of two divisions—first, sewers for new streets; second, sewers for the interception of the sewage, the latter consisting of two—viz., the Roach Sewer and the Irwell Sewer. When completed the intercepting sewers would be capable of conveying the whole of the sewage of the borough to one point. In the former division were contained some 10¼ miles of pipe-sewers, the estimated cost of which was £11,830, being after the rate of £651 6s. per mile, to which must be added a further sum of £3,872 10s. for manholes, ventilators and street gullies, making together a sum of £15,702 10s. In the second division were included over fifty miles of intercepting sewers, varying in size from 3′ × 2′ to 4′ × 2′ 8″, the estimated cost of which was £30,148 15s. The sewers are designed to convey the sewage of double the present population, together with a rainfall equal to ¼ of an inch in 24 hours; and the mean velocity of flow in the sewers would equal 4½ feet per second. Storm overflows would be provided at suitable points, which would convey heavy falls of rain direct into the river. At the proposed outfall there was land which, whilst situate within the borough, was, both as to situation, levels, nature of soil, &c., well fitted for sewage purification works. Mr. Harrison observed that however well the interception might have been devised, yet as no scheme had been determined as to the purification of the sewage on its arrival at the outfall, he did not think the Local Government Board would favourably consider the application. Mr. Cartwright pointed out that the town council had shown a scheme whereby the sewage of the borough could be intercepted and brought to one point; that there was suitable land at that point for the erection of works when the mode of purification should be determined; that the proposed new street sewers would, in any scheme of interception which might hereafter be adopted, empty their sewage into the same, therefore the Local Government Board might be induced to sanction the loan of £15,000 in order to carry out the sewers in the first division. The inspector again intimated that the Local Government Board would not be favourable to grant money for the extension of sewers unless the council gave proof of their intention to proceed with some method of purification. Mr. Harrison, in company with the borough surveyor, then proceeded to view the proprosed outfall, and expressed his approval of the site.

Chelmsford.—On Thursday, the 17th inst., Mr. Samuel J. Smith, C.E., one of the inspectors of the Local Government Board, held an inquiry at Chelmsford Corn Exchange into an application from the Board of Health for permission to borrow £20,000 to carry out the proposed new works for the disposal of the sewage of the parish of Chelmsford and a part of Widford. There was also before the inspector an application from the Rural Sanitary Authority for permission to borrow the several sums of £5,500, £3,800, and £450, for the sewerage of Springfield, Great Baddon, and that portion of Widford which is not included in the Chelmsford urban district. The circumstances of the proposed sewerage scheme, the character of the works, and the estimated expenditure in carrying them out were explained by Mr. F. Chancellor, Mr. Dixon, and Mr. Chas. Pertwee on behalf of the Board. There was no opposition to the main scheme, but considerable discussion occurred as to points of detail, and at the close of the inquiry the inspector proceeded to examine the district.

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The new railway bridge, works, and station at Sunderland, constructed at a cost of half a million by the North Eastern Railway Company, were opened for use on Monday week.

LEGAL INTELLIGENCE.

Architects' Charges.—Varley *v.* Ormandy.—This case was tried at the last Lancaster assizes by Mr. Justice Bowen, and on application of counsel for the defendant the case was heard by his lordship without a jury. It was an action brought to obtain payment for plans, specifications, working detail drawings, tracings, and quantities prepared for the erection of a vicarage at Accrington. The charges made were 2½ per cent. for preliminary sketches, general drawings, and specifications, 1¼ per cent. for detail working drawings, and 2½ per cent. for quantities. The work was done in 1872, and a grant was obtained from the Ecclesiastical Commissioners for £900, and also a grant of £100 from the Manchester Diocesan Society, and a further sum of £600 was obtained by subscriptions. After the grants were made the defendant put off the erection of the vicarage from year to year, and when this action was brought he pleaded a special agreement, and also the statute of limitation. His lordship, in giving judgment, said that the two first items should be paid, with costs, and an arrangement made that the quantities should be paid for when the vicarage was erected.

Road Locomotives. — On August 6th, at the Petty Sessions of Termonfeckin, Co. Louth, before Captain Keogh, R.M., Richard T. Montgomery, Esq., J.P., John Neville, Esq., C.E., M.R.I.A., the County Surveyor of Louth, summoned Mr. William Butterby, of Clonmore, for breaking down several gullets, &c., on the road from Port to Clogherhead, on the 15th, 16th, 17th, and 18th of July last. The summons was brought under the 28th and 29th Victoria, cap. 83, section 9, which provides that, "All compensation for damage done by any locomotive to any bridge, gullet, or arch, or any of the walls, buttresses, or supports thereof, on any road made or repaired by Grand Jury Presentment in any county in Ireland, shall be recoverable in the name of the County Surveyor thereof, for and on behalf of the county, from the party liable to pay the same; such compensation, if not exceeding ten pounds, to be recovered in a summary way, by summons at Petty Sessions, and if over ten pounds, to be recovered by process in the Civil Bill Court." The County Surveyor's assistant Mr. Henry, proved his case, and the Court gave a decree for £9 10s., the amount claimed, and £1 costs. The magistrates suggested that they were desirous that he should lodge an appeal, and have the case argued in the superior courts, but he declined doing so, and paid the amount.

Who Should Pay Sub-contractor for Extras?—At Hull County-court, on the 7th inst., before Mr. F. A. Bedwell, judge, the case of Wilkinson *v.* Brocklesby was heard. The claim was for £45 3s. 11d. for extras on a contract. The defendant was the architect for the erection of a building in the Commercial-road, Hull, and plaintiff took a sub-contract for gas-fittings. During the progress of the work several extras were incurred, and as defendant had repeatedly given orders, the bill was sent in to him. He now denied his liability, saying that the chief contractor, Mr. Wilkinson, should have paid the difference. Wilkinson was called, and acknowledged his indebtedness, saying that he had paid £31, and that the charges were excessive. His Honour gave plaintiff a verdict for £8 beyond the sum paid into court.

CHIPS.

The new clock-tower at Sir Henry Peek's residence, at Rousdon, was opened on Monday, the 4th inst. There are ten bells in the tower, which chime the quarters and play a selection of tunes at intervals during the day. Messrs. Gillett and Bland, of Croydon, are the makers of the clock and bells.

At the meeting of the directors of the Dublin South City Markets Company, on Thursday in last week, a report was read showing that steady work is being made with the erection of these buildings. The contract is being carried out by Mr. John Hall Thorp, of Leeds, who took it at £61,500, and a separate contract has been made with Messrs. Johnson and Co., of Keymer Junction, Sussex, for terra-cotta work at £2,034. Of the ring of houses surrounding the central hall, those fronting Exchequer-street are to be opened on May 1st, 1880, those next George-street, which are of the highest class, on July 1st, 1880, and the entire structure, including market hall, shops, and cellars, is to be completed by the 1st of March, 1881.

On Friday, the 8th August, a Temperance Hotel was opened at Bradford-on-Avon. The hotel is a new building of handsome design, standing in the leading thoroughfare of the town. It has been erected at the entire expense of the Rev. J. C. Thring, of Chantry House, from designs of the architect, Mr. Charles S. Adye, Town-hall Chambers, Bradford-on-Avon, and the whole of the works have been carried out by Messrs. F. and W. Long, of the same place, builders.

Our Office Table.

The Trustees of the British Museum have, it is said, obtained a successor to Mr. Hormuzd Rassam in the work of Assyrian exploration. Lieutenant Kitchener, R.E., whose name has for many years been closely connected with the work of the Palestine Exploration Fund, has accepted the post, and will as soon as official duties permit start for Mosul. Lieutenant Kitchener has only just returned from Cyprus, where he had been sent to arrange for the ordnance survey of that island. The explorations on the site of Carcherish and Northern Mesopotamia have been intrusted to the charge of Mr. Henderson, the British Consul at Aleppo. Mr. Henderson is the successor of Mr. Skene, to whom we owe the discovery of the sculptures and Hamathite inscriptions at Jeratohis. The British Museum has also obtained a firman for explorations in Armenia and the district of Lake Van, but no arrangements for working the same have as yet been made.

On Saturday last, Captain Douglas Galton distributed certificates to the successful students of the Crystal Palace School of Practical Engineering. Captain Galton, in the course of his address to the students, said that the question of English technical education was most important. Great improvements had been made by Continental nations lately in the manufacture of machinery, and had been due mainly to the care with which they fostered technical education. The question how far we should be able to hold our own in the struggle for industrial ascendency largely depended on our success in the same educational work. The artisan necessarily looked to precision, but the mechanical and civil engineer was under the further necessity of applying the knowledge of physical science to the conveniences of daily life. The course laid down at the school showed the vastness of the field of knowledge open to the practical engineer. Professor Huxley had said that success in life depended on industry and a good stomach; but to those two conditions he would add, in the case of engineers, a third—namely, the habit of observation. In their profession no fact was too small to be important. An engineer's education was always progressive, in consequence of our daily increasing knowledge of physical science, but whatever the extent to which it ought to be carried, it should always be exact. No one had done more to make practical engineering exact than Sir Joseph Whitworth. Errors and inaccuracies of construction which had formerly been regarded as trivial had been shown by him to be matters of primary importance in machinery; and, indeed, in respect of careful and minute experiment, the productions of his works approached as nearly as possible to mathematical and theoretical correctness.

An Art Treasures Exhibition—the object of which is to obtain funds for the erection of a building for the School of Art in Chester, a site having been promised by the Duke of Westminster—was opened on Monday night by Mr. Gladstone. In the course of his speech he said that as long as America suffered from the present fever of Protection the English manufacturer would not have a great deal to fear from rivalry in that direction; but when America learnt to trust entirely to her own splendid natural resources, to the great genius of her people, and to her marvellous proficiency in the adoption of labour-saving appliances, in which she was at the head of the world, then America would be a formidable competitor of England. What England suffered from was not so much competition as the limitation of foreign markets protected by hostile tariffs. The British producer must endeavour to make his work true—not professing to be better than it was. The English were not defective in the matter of beauty and taste, but in the quality or habit which connected the sense of beauty with the production of works of utility. We wanted to make the English workman understand that by learning to appreciate beauty in industrial productions he was improving his mind and increasing the value of his labour.

There is at present on exhibition in New York a section of an immense tree which has been brought from California. The *New York Herald* says:—"This wonderful specimen of nature's handiwork was discovered in 1874. It was growing in a grove near Tule River, Tulare county, California, about 75 miles from Visalia. Its top had been broken off, probably at some remote period, and when discovered it was still 240ft. high. The body of the tree where it was broken was 12ft. in diameter, and had two limbs measuring respectively, 9ft. and 10ft. in diameter. The trunk measured below 111ft. This ancient monarch of the forest is called 'Old Moses,' after a mountain near which it stood. It is supposed to be 4,840 years old, and it is the largest tree that has ever been discovered. The section on exhibition is 75ft. in circumference, and 25ft. across. It is capable of holding 150 people in its interior. The interior, as it is now fitted up, is arranged like a drawing-room. A carpet has been laid down; there is a piano, sofa, tables and chairs, with scenes from California hung around, and people move about quite freely."

The problem of cooling houses in summer is one that has often been discussed without leading, unless in a few isolated cases, to any practical results; the means that have been usually proposed—ice or compressed air—being too expensive and too difficult of application to commend themselves to common use. The idea of relying upon the earth as a great reservoir of uniform temperature does not seem to have been much considered. In a late number of the (American) *Medical Record*, however, is an article describing a contrivance invented by Mr. J. Wilkinson, of Baltimore, which, according to the *American Architect*, puts the uniformity of the earth's temperature to a very practical use. The room to which he has practically applied it is used as a dairy, in which a nearly uniform temperature is very desirable. A site was taken on a declivity, apparently. The floor of the room was sunk 6ft. or 7ft. below the surface, and a 6in. air-pipe 100ft. long was carried underground to near the bottom of it, with a pitch of about 7ft. in its length, opening to the air at the upper end. A similar pipe of like pitch was carried down from the bottom of the room and opened to the air at a point in the ground at a lower level. There was then a continuous conduit of 200ft. long and 14ft. fall, passing undergound from a higher to a lower level and expanding in the middle into a chamber. By keeping the pipe for the most part some 5ft. below the surface it was surrounded by earth whose temperature in summer and winter did not vary much from 50°. In warm weather the cold air in the pipe poured out at the lower end, and the outer air entering at the upper end was cooled in its turn and followed down, producing a cool draught through the room. In cold weather the air in the pipe was warmer than the air outside, and an upward draught was produced, escaping above and warming the air of the room. By this contrivance, it is said, a uniform temperature of about 60° was maintained in the dairy the year round.

The 22nd annual report of the trustees of the National Portrait Gallery has been published. It mentions that during the year numerous donations have been received, and gives a list of historical portraits to the number of 68 which have been transferred from the British Museum. The purchases made were stated in the previous report to amount to 329, and a list now published brings up the number to 345. Since 1873, when original letters as specimens of handwriting in connection with portraiture were first exhibited in the gallery, a considerable number of very valuable autographs have been received. The report remarks that, although many of them possess great historical as well as literary interest, they are exclusively donations, as the trustees do not consider themselves warranted to appropriate any part of the fund annually placed at their disposal for the purchase of any object beyond direct portraiture, either painting, sculpture, drawing, or engraving. The number of visitors to the gallery last year was 72,105. Being now in possession of more ample space, and prompted by a desire to render the collection more generally available, the trustees have resolved to open the gallery to the public without restriction every day in the week excepting one. Friday has, therefore, been set apart for the purpose of cleaning and occasional alterations, and on that day no one is admitted. Artists will be allowed, subject to the rules already laid down, to copy on Tuesdays, Wednesdays, and Thursdays, between the hours of 10 and 2.

The so-called *ténevières*, or artificial islets or lake stations, of the Swiss lakes, and especially of the Stone age, form the subject of a recent paper by Prof. Forel in the *Archives des Sciences*. These islets are submerged under one or two metres of water, but have emerged in several lakes through sinking of the water-level. They rise considerably above the sandy bottom, and are found to consist of stones of various size. M. Forel is of opinion (and he gives his reasons) that the *ténevière* is not, as M. Deson has supposed, an intentional construction, made with a determinate object, but an accidental product resulting from the fortuitous action of the elements on the residues of human life and industry.

There is much tribulation in certain quarters as to the future fate of Exeter Hall. The Middlesex magistrates and the Metropolitan Board of Works insist that proper means of safe exit shall be provided, at an expense of £1,000, before any further licence for musical performances shall be granted. The proprietors have no funds for such necessary alterations, and have been receiving only a dividend fluctuating between 2 and 2½ per cent. An offer has been made to purchase the property with a view of converting it into hotel or club chambers for £25,000, which would yield £45 per £50 share. With a view of preventing this sale, Mr. Samuel Morley and other Nonconformists are buying up shares at a fixed price of £22 10s. ;—not a bad speculation, looking at the offer that has been made, and attention has been called to the fact in a circular issued by the directors. After stating that the chief musical tenants—the Sacred Harmonic Society—have given notice to leave, they say it is further to be observed that the hall is less used by the religious societies than is generally supposed.

Some workmen engaged on Tuesday in making excavations on the property of Mr. Richard Twining, near Tooting, for the foundation of some new buildings, at a depth of 20ft. one of them struck his spade against something brittle. On an examination being made, some antique Roman and Etruscan ware was unearthed, and the following articles found:—A quantity of glass, with etching in gold, representing two figures of the early Christian age; some specimens of glass vases, of great iridescence; a Roman glass bowl, broken in 15 pieces, in white, yellow, blue, ruby, and other colours; a vase of antique Roman manufacture, in four pieces; a lance, battle-axe, and dagger; also some bronze weapons in fragments, and a silver cup, the whole of these being fused together apparently by fire. Alongside these treasures was found an immense square copper box, the lid lying next the articles named, and the other portion broken in halves, the treasures having evidently been once inclosed in it. The whole of the valuables were removed to Mr. Twining's residence.

The opening of the first fine art exhibition in South London took place yesterday, having been deferred in consequence of the number of important works sent in, the collection being more than twice as large as was expected. The chief portraits are lent by Sir Charles Dilke, M.P., and include one of Mr. J. S. Mill by Watts, one of Professor Fawcett by Madox Brown, and one of Gambetta by Le Gros. Mr. P. A. Taylor, M.P., has lent a large number of valuable works, including some by Goodwin, Webb, Stansfield, Moore, &c. Mr. Woolner, R.A., also lends a large number, including Turners, Cotmans, Reynolds, and Nasmyths. There are also pictures by Guido, Spagnoletti, Hogarth, and Sir F. Leighton, the President of the Royal Academy. The exhibition will be open free on and after to-day from 2 till 5 and from 7 till 10 p.m., and on Sundays from 6 to 10 p.m. It is in the rooms of the Working Men's College and Free Library, 143, Upper Kennington-lane, near Vauxhall-bridge.

The clerk to the Bethnal Green Guardians was recently instructed to inquire of architects on what terms they would prepare plans and specifications and superintend the works in connection with new schools at Leytonstone. At the last meeting of the guardians the replies were read, and considerable discussion ensued upon each letter. The names and estimates received were as follows:—Knightly, 5 per cent. on the outlay, and offering to dispense with the clerk of the works; Vachell, 5 per cent.; Snell, 5 per cent.; Hill and Fletcher, 5 per cent.; A. and C. Harston, 5 per cent.; Lee and Smith, 5 per cent.; Stone, 5 per cent.; Jackson, 5 per cent. on the first £1,000, and 3½ per cent. afterwards; Ingram, 2½ per cent.; Wilson and Aldwinckle, 2½ per cent. A lengthy debate followed, Mr. Milbourn endeavouring to have the names proposed, seconded, and voted upon *seriatim*; but the feeling of the guardians was against this, the chairman remarking that it would save a great deal of ill-feeling if the names were simply read out and immediately voted upon. Mr. Milbourn said the course suggested by the chairman was the usual one when officers were elected, but not when it was a question of tender. He further described the course as a "fluke" and a "dodge," which gave rise to a somewhat animated discussion. Ultimately, upon being put to the meeting, the resolution as suggested by the chairman was carried by a large majority over Mr. Milbourn's amendment; and upon a division being claimed, the numbers were 14 for and 6 against. The several names were then read, and, after being reduced to three, the numbers were respectively — Harston, 12; Knightly, 7; Wilson, 8, on the first vote. The second showed Harston, 11; Knightly, 1; Wilson, 10; and the final resting alone with Messrs. Harston and Wilson, decided the former to be the chosen, 13 votes being recorded for Harston and 9 for Mr. Wilson, whereupon Mr. Milbourn remarked, "There go a few hundreds of the ratepayers' money."

◆

Holloway's Pills in occasional doses during hot weather are the best correctives of the frequent bilious attacks to which some persons are very liable. Safe and effective as aperients—these Pills are no less valuable as alteratives to relieve oppressed organs and throw increased work on those which are torpid.—[Advt.]

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Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of Fevers, Biliousness, Smallpox, Skin Diseases, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[Advt.]

CHIPS.

On Wednesday week the memorial stones of a new schoolroom and manse for the minister of the Congregational church, Sandown, Isle of Wight, were laid. The schoolroom will hold about 200 scholars, and include three class-rooms. The architect is Mr. James Newman, and the builder Mr. J. White. The cost of the structure will be £1,850.

A new organ, built by Messrs. Hill, of London, was opened on Sunday week at Angmering Church, Sussex. A chamber has been built adjoining the chancel to receive it.

At Billinghurst, Sussex, Messrs. J. and D. Wadey, builders, of Five Oaks, have just completed the enlargement of Tedfold House, the seat of Mr. C. W. Schroter, to twice its original size. Somers estate, in the same parish, has recently changed hands; the old house has been razed to the ground, and a larger mansion is in course of erection on the same site for the present owner, Mr. H. Gough. Messrs. Braid and Co., of Chelsea, are the contractors.

The board of the Derry Central Railway Company have entered into a contract for the erection of stations with Messrs. Dixon and Co., Belfast, and they are to be completed by November. The whole of the line has been brought to formation level with the exception of less than two miles. Thirty-seven bridges have been built, but the chief one in progress is that over the river Bann, of which the foundations are all in, the masonry nearly completed, and the ironwork in course of erection. The engineer to the company, Mr. Barton, of Dundalk, expects in a few months to have the line ready for opening.

Dr. Tristram, the Chancellor of the Diocese of London, granted a Faculty on Monday for the erection of a mortuary and *post-mortem* room on the old burial-ground between Mount-street and South-street, Grosvenor-square. The Chancellor, in overruling the opposition to the granting of a Faculty, said that a mortuary such as that proposed would be beneficial in preventing the spread of contagious diseases.

The premises of the Bank of Australasia, at Masterton, in the northern island of New Zealand, were totally destroyed by fire in March last. The strong-room was fitted with a door supplied by Messrs. Chubb and Son, the excellence of which saved the bank from considerable loss and serious inconvenience, and has once more proved the fire-resisting qualities of the strong-room doors manufactured by Messrs. Chubb.

A Local Government Board inquiry was held at Great Yarmouth on Thursday, the 7th inst., by Major Tulloch, with reference to an application for a loan of £420 for paving and channelling works to the roads. The town surveyor explained the plans, to which no opposition was raised by ratepayers.

◆

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N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION.

TENDERS.

Arundel.—In the list published on p. 174, by an oversight, it was omitted to state that quantities were prepared by Mr. Henry Smith, of 8, John-street, Adelphi.

Blackburn.—For the erection of a school to accommodate 750 children in Moss-street, for the Blackburn School Board. Mr. William S. Varley, architect, Blackburn. Quantities supplied :—

Stones and Son, Blackburn ...	£6,198	0	0
Duckworth, H. and A., Blackburn	6,190	0	0
Bailey, Blackburn	6,155	2	0
Field and Sons, Blackburn ...	6,071	10	0
Fecitt, Blackburn	6,055	0	0
Byrom, Blackburn	6,053	0	0
Cronsham, J. W., Blackburn ...	6,000	0	0
Ramsbottom and Son, Accrington	6,000	0	0
Dent and Marshall, Blackburn ...	5,949	10	0
Clegg, Accrington	5,919	10	0
Whittaker, Blackburn	5,900	0	0
Abbott, Blackburn	5,887	10	0
Chew, Blackburn	5,809	0	0
Smith, G. and J., Burnley	5,765	0	0
Higson and Sons, Blackburn ...	5,680	0	0
Lewis and Son, Blackburn ...	5,669	0	0
Hindle, Blackburn	5,664	0	0
Holt and Kenyon, Blackburn* ...	5,327	0	0

* Accepted.

For heating the school with hot water :—

Baldwin's executors ... £270 and	£255	0	0
Barton and Son	255	0	0
Mercer, Bros. (accepted)	247	10	0

Brentford.—For the erection of pair of semi-detached cottages in the Glenhurst-road, Brentford, for F. J. Evans, Esq. Messrs. Smithies and Gladman, architects :—

Falkner	£784	0	0
Nye	705	0	0
Taylor	644	0	0
Brunsden	600	0	0
Beauchamp	597	0	0

Bushey.—For new church, near Watford, Herts. Messrs. Coe and Robinson, architects. Quantities supplied :—

Stone building :—

Waterman, Bros.	£7,193	0	0
Dove, Bros.	6,795	0	0
Wall and Hook	6,782	0	0
Chappill	6,734	0	0
Shephard	6,575	0	0
Andrews and Sons	6,334	0	0

Second tenders. Brick building :—

Mr. Syme, architect, Watford. Quantities not supplied.

Andrews and Sons	£5 225	0	0
Waterman, Bros. (accepted) ...	5,220	0	0

Chiswick.—For seven houses, Chiswick. Mr. T. Roger Smith, architect :—

Downs, W. B. and Co. (accepted).

Cubitt Town.—For the erection of a mission hall in Glengall-road, Manchester-road, Cubitt Town, E. Mr. H. H. Bridgman, A.R.I.B.A., architect, 42, Poultry, E.C. Quantities by Mr. F. Thomson, surveyor, 20, York-buildings, Adelphi, W.C. :—

Amended tender :—

Hunt, J. R. (accepted)	£826	17	1

Findon, Sussex.—For the erection of a house at Muntham-court, near Findon, for the Marchioness Dowager of Bath. Mr. C. N. Beazley, of London, architect :—

Knapp, of London	£752	0	0
Stanbridge, of Broadwater	640	0	0
Terry, Storrington	619	0	0

Hadley.—For the erection of a villa residence in Woodville-road, Hadley-by-Barnet, for J. B. Poole, Esq. Mr. H. H. Bridgman, A.R.I.B.A., architect, 42, Poultry, E.C. Quantities by Mr. F. Thomson, surveyor, 20, York-buildings, Adelphi, W.C. :—

Burman, H.	£2,740	0	0
Castle, W. and H.	2,627	0	0
Manley, M.	2,499	0	0
Scrivener and Co.	2,440	0	0
Frost and Co....	2,419	10	0
Toms, E.	2,390	0	0
Staines and Son	2,384	0	0
Sims, A	2,365	0	0
Niblett, W. T.	2,330	0	0
Moreland and Nixon	2,300	0	0
Kirk and Randall	2,292	0	0
Niblett, E.	2,280	0	0
Gould and Brand	2,275	0	0
Hunt, J. R.	2,230	0	0
Chinnock	2,200	0	0
Somerville and Hill	2,197	0	0
Richardson, Bros	2,175	0	0
Taylor, W. P. (accepted)	2,089	17	3

Kentish Town.—For extensions to the Camden Turkish Baths, 11a, Kentish Town-road, N.W. Mr. H. H. Bridgman, A.R.I.B.A., architect, 42, Poultry, E.C. :—

Hunt, J. R. (accepted), by schedule.

London.—For alterations to the Assembly House, Kentish Town, for W. Harwood, Esq. Mr. Edward Brown, architect, 5, Church-street, Spitalfields :—

Smeed, R. J. (accepted).

London.—For alterations to the "Bricklayers' Arms," Collingwood-street, Bethnal-green, for Mr. J. Stockton. Mr. Edward Brown, architect :—

Impey, W. (accepted).

London.—For alterations to the "Plasterers' Arms," Seymour-street, Euston-road, for Mr. F. Johnson. Mr. Edward Brown, architect :—

Impey, W. (accepted).

London.—For two warehouses, Bucknell-street, Oxford-street. Mr. W. S. Trehearne, architect :—

Downs, W. B. and Co. (accepted)

Prittlewell Cemetery.—In our last issue this should have read, "Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove."

Tickhill.—For the restoration of St. Mary's Church Tickhill. Mr. J. M. Teale, architect, Doncaster :—

Smith and Co., Worksop	£1,200	0	0
Denison, W., Normanton	747	3	0
Langley, Bolsover	725	0	0
Amlay, W., Doncaster	711	7	0
Tomlinson and Sons, Sheffield ...	700	0	0
Ranson and Co., Tickhill*... ...	700	0	0
Howitt, Doncaster	694	0	0
Jackson and Son, Whitwell ...	694	0	0
Chadwick and Co., Masborough ...	627	0	0
Dennison, W., York	576	0	0

Tiverton.—For alterations and additions to Eastfield, Tiverton, for T. O. Lazenby, Esq. Mr. E. W. Barnes, architect, Bristol. Quantities by Mr. Arthur Deau, Bristol :—

Church, Bristol	£2,594	0	0
Baker and Sons, Bristol	2,485	0	0
Gratten, Tiverton	2,200	0	0
Stephens and Bastow, Bristol* ...	2,199	0	0
Barrow, Tiverton	2,099	0	0
Denning, Tiverton	2,038	0	0
Stock, Bristol	1,840	0	0
Phillips, Bristol	1,630	0	0

Walsall.—For alterations and additions to the Agricultural Hall, Walsall. Mr. Samuel Loxton, architect, The Bridge, Walsall. Quantities by the architect :—

Davis, James, and Son, Malvern...	£2,745	0	0
Wistance, William, Walsall ...	2,500	0	0
Bethell, Enoch, Malvern	2,500	0	0
Evans, David, Wolverhampton ...	2,178	15	0
Pilshaw, H. G., Walsall	2,176	0	0
Wiley, William, Wolverhampton	2,126	18	0
Trow and Sons, Wednesbury ...	2,100	0	0
Crutchley, T. C., Walsall	1,923	0	0
Pritchard and Feltham, Birmghm.	1,897	0	0
Jones and Sons, Sedgley	1,885	0	0
Millward, executors of, Dudley*...	1,698	15	6

* Accepted.

Walthamstow.—For the erection of 13 houses in Albert-road, Walthamstow, for Mr. N. Argent. Mr. Edward Brown, architect, 5, Church-street, Spitalfields :—

Perry and Co....	£5,460	0	0
Outhwaite and Son	5,243	0	0
Hearle and Son	5,085	0	0
Marr, R.	4,978	0	0
Gann, G.	4,841	0	0
Salt, S....	4,600	0	0
Good, E. (accepted)	4,138	0	0

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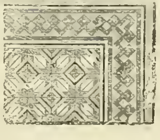

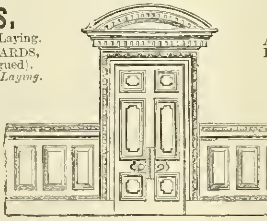

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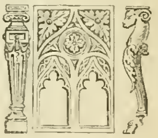

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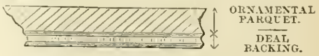

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SURVEYOR of WORKS.—WANTED, by the Burgh of Dumfries, a SURVEYOR of WORKS to act for the Town Council, Police, and Gas Commissions and various Local Authorities of the Burgh. The appointment will be during pleasure of the Council. Salary, £150 per annum. The duties may be ascertained from, and applications with certificates lodged with, WILLIAM MARTIN, Town Clerk, Dumfries, on or before 1st September next. The Council are not to be bound to appoint any of the applicants.

Dumfries, Aug. 8th, 1879.

TO ARCHITECTS.—An Assistant of good practical experience is open to an ENGAGEMENT.—Address, X. Y., 49, Bolsover-street, Portland-road, W.

FIGURE PAINTER. — A Young Decorative Figure Painter desires an ENGAGEMENT with a good firm of Glass Stainers or Interior Decorators. Terms moderate.—Address, W. 9., care of B Wheeler, Newspaper and Advertising Agent, Manchester.

ASSISTANT (Competent) would be glad of temporary or home work. Good references.—H. M., 39, Hill-street, Knightsbridge, S.W.

WANTED. — A WORKING SHOP FOREMAN; one who understands machinery preferred. —Address, stating wages and references, to J. L. GLASSCOCK, Builder, Bishops Stortford, Herts.

CLERK OF WORKS desires an ENGAGEMENT; just finishing new wings to an Asylum. Good references and testimonials from London and Country Architects.—Address, T. L., Manor House, Pottern, near Devizes, Wilts.

JUNIOR ASSISTANT seeks RE-ENGAGEMENT; neat and quick draughtsman, thoroughly conversant with his duties, and has good references.—SIGMA, 40, Gregory-street, Mansfield-road, Nottingham.

WANTED. — A SECOND-HAND CORRUGATED IRON BUILDING, 40ft. wide by 45 or 50ft. long; or two—one 22ft. and one 18ft wide by from 30 to 40ft. long.—Particulars to EATON and SON, Ironmongers, Swansea.

WANTED.—About 12 MASONS; only those accustomed to Soft Stone need apply.—JOHN YEARS and Co., Builders, 22, Craven-terrace, Hyde Park, W.

ARCHITECT'S ASSISTANT of 13 years' experience; well up in working and detail drawing, with practical knowledge in carrying out the same. Good references.—WELLS, 93, Lombard-street, West Derby-road, Liverpool.

WANTED, a BUILDER'S CLERK, well versed in Estimating and Prime Cost.—Apply, Builder, Post Office, Swindon.

ARCHITECT'S ASSISTANT, or ASSISTANT CLERK of WORKS (competent to take a small job), wants RE-ENGAGEMENT. Good references.—J., care of Mr. R. READ, The Chancellors, Fulham-road, Hammersmith.

JUNIOR ASSISTANT seeks RE-ENGAGEMENT; neat and quick draughtsman and writer, details, &c. from sketches; 5 years' experience; terms moderate.—A. B., 27, Marchmont-street, Russell-square, W.C.

ASSISTANT (Architect's) requires EMPLOYMENT temporary or permanent. Excellent references. Salary moderate.—J. C., 93, Clarendon-road, Notting Hill, W.

POCKET SEXTANTS, £1 15s. 0d.— PRISMATIC COMPASSES, 18s. 6d., ABNEY LEVELS, £1 5s. 0d.; Cases of INSTRUMENTS, £1 8s. 6d. The above prices include cases, and are all made by Elliott Bros., Strand, and in perfect adjustment, same as used at the Royal Military Academy. Forwarded carriage free on receipt of P.O.O.

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WILLIAM J. VIAN, *Secretary.*

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 22, 1879.

THE ARCHITECTURAL CAPABILITIES OF LONDON.

IN the street improvements carried out and contemplated by the Metropolitan Board of Works it really seems that very little regard has been paid to architectural effect. For instance, the improvements of the streets in the neighbourhood of the National Gallery seriously threatened, by cutting off the steps of the portico of St. Martin's Church, to injure that fine specimen of the architecture of the Revival. The Board, however, in this case wisely abandoned their intention of interfering with Gibbs' celebrated structure in deference to public opinion, and it is quite certain that other proposed alterations might be made with little or no increased cost which might add to rather than detract from the appearance of the metropolis. The subject was taken up partly some time ago in a paper read before the Institute by Mr. T. Morris, suggesting certain routes, such as a direct street from Piccadilly to Somerset House, one of easy curvature from the top of the Haymarket to St. Martin's-street, and other roadways in a north and south direction—a report of which appeared at the time in the BUILDING NEWS. Worthy of consideration as these suggestions were, they overlooked the question of cost. What we wish to call attention to here is the advantage of securing architectural improvement as well as directness of route. We are sure that if the Board were to exercise a little more watchfulness over the principal sites and centres of traffic, the disagreeable angles and junctions which mar all their new streets might be avoided, and certainly more agreeable lines of thoroughfare secured. The lines fixed upon by Mr. Vulliamy and Sir Joseph Bazalgette are, without doubt, those which practically commend themselves with respect to cost of purchase and directness of route. We do not doubt this for a moment; but another, and, to our minds, equally practical question is, How can they be brought to combine with existing streets and buildings, and harmonise with important sites in the most desirable manner, and to leave on either side building plots of sufficient depth and value to induce the erection of buildings of utility or architectural importance? From a survey of some of the recent lines of road made, we do not hesitate to say these considerations have been totally ignored, as, for instance, in the route proposed westward into Piccadilly-circus, and the one running east and west from Hart-street, Bloomsbury, to Clerkenwell, which last has been already carried out. In both these the routes cut awkwardly across several blocks of old houses, and we find no provision made for displaced properties. We notice, for instance, in the last-named new thoroughfare some very small plots of land, too shallow for any but an inferior class of tenement property, while the junction with Red Lion-square has been missed or left to take care of itself. A very slight deviation southward at the last point would have made the square a feature in the thoroughfare. Instead of thus utilising the area, a block of old houses intervenes on the north side, and a focus or centre around which a neighbourhood of really architectural erections could have been formed, has been thrown away. We simply urge in short that our public structures and squares be made, where practicable, the intersections of our new streets, capable of being developed into centres of attraction and commercial activity. Many of the finest public buildings of London are hidden, instead of being brought into view. Take the British Museum, the Bank, St. Stephen's, Walbrook, as a few instances of the sacrifice of important buildings. At the eastern *embouchure* of Queen Victoria-street the vacant space on the west side of the Mansion House has long been an eyesore. The Blackfriar's end of the same street, which has been lauded to the skies by some as such a model thoroughfare, exhibits the same wasteful disregard of property and effect; the whole seems an aimless chance-medley unworthy of the metropolis. We could go on multiplying instances where new thoroughfares have been made and old ones reformed without any further object beyond the pulling down and widening of a few yards. The proposed street leading into Piccadilly-circus, whenever that scheme is carried out, ought to furnish an opportunity for improved architectural planning. Another equally valuable chance will be the reconstruction of the block of building between Essex-street and old Temple Bar, which now appears to protrude beyond the line of the Strand. When St. Clement's church was built the houses on the south side were set back to a curved line, but the alteration was too piecemeal. Now the principal façade of the Law Courts will front this part of the Strand, it becomes of the utmost consequence to the future architectural effect of this thoroughfare that a considerable widening should be made here. The dilapidated block of houses between St. Mary-le-Strand and St. Clement's would, if removed, contribute to the effect of the whole, and enable the Board, by the valuable frontages, to recover for the lost property. Financial considerations are, of necessity, to be studied in all street improvements; but the Board, by dealing in a large and liberal spirit, will find that the money they spend to clear away objectionable dwellings and to widen, will be returned almost immediately by the improved ground-rents created. What we desire to point out is, that the prospective capabilities and architectural elements of a new road or street, after all, are, economically, worth serious consideration; that there are a dozen sites in London which might be doubled in value, if only the public authorities were to clear them of incumbrances, and provide plots of sufficient area and depth to make them worth the attention of capitalists. Ludgate-circus is one deplorable instance of mismanaged improvement. The corner plots on which the quadrants are built are so reduced in size and depth as to become valueless for buildings of an important kind, hence their present forlorn appearance. Here was a grand site for a central junction, now all but spoilt, and consigned to huge posters and flaming placards.

We have hinted that in some of the new streets the property is cut through at an angle too acute for buildings of any pretence to architecture. Now, this is a very easy thing to avoid in most cases, simply by diverting the branches more nearly at right angles, or by forming a square or circus. A triangular plot can only be utilised for a public-house; no other kind of building would answer upon it. Of course architecture is out of the question, as the angle can be only canted or rounded, and the whole superstructure supported on a few spindling columns. When the corner is emphasised by a cupola we have something like a combination of the sublime and ridiculous. It would be a consideration worth the attention of the Metropolitan Board, to avoid these angular plots by rearranging the properties in the vicinity. In all cases the angle plot is the eyesore of the neighbourhood, and it would be thoroughly carrying out the functions of a public board if these sites were re-arranged upon the square, and planned for buildings of some importance. It is also far better to plan a line of frontages with some regard to the public buildings and squares on the way, than to draw a straight line between two points. Pope in his "Essay on Criticism," well says—

> "He gains all points who pleasingly confounds,
> Surprises, varies, and conceals the bounds."

The architectural artist knows the full value of this precept, and if the projectors of our new streets were to study the most convenient points of junction, instead of laying so much stress upon straight and direct routes between points of nondescript interest, something might still be done to redeem our yet uncommenced improvements from the charge of aimless extravagance. If by a slight diversion we can open up to view one or two public buildings now buried in brick and mortar, relieve a few great centres of business, and add to the value of our building sites, there seems little reason, except the incompetence of those whose business it is to help us in the matter, why it should not be done.

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THE NATIONAL WATER SUPPLY EXHIBITION AT THE ALEXANDRA PALACE.

AN exhibition having a special interest just now was formally opened last Thursday by the Lord Mayor at the Alexandra Palace. We heartily commend the object the promoters have in view in bringing together in a building devoted to popular purposes appliances and data on so important a question as the national water supply, as it is undoubtedly one that concerns the north as well as the south of London. Although the exhibition now on view in the main vestibule of the Palace is only the nucleus of what is contemplated, it still affords something like a criterion of the progress that has been made during the last few years in increasing our knowledge of the available resources at command. The reports of Government Commissions, the Society of Arts' suggestions, and the labours of Mr. G. J. Symons upon the rainfall of the various districts in the United Kingdom have accumulated a mass of information of the greatest value towards determining the problem. All that seems needful now is a careful analysis and classification of the data and materials collected, and a scientific commission to inquire into the watershed areas of the country. The lack of arrangement and want of order apparent in the objects already brought together at Muswell Hill show clearly enough that some method is required. Charts and paper schemes are numerous. Of course apparatus for water analysis makes a feature in the exhibition, and we see a large case devoted to apparatus and processes. Messrs. Wanklyn and Chapman exhibit their various apparatus and reagents in solution, ammonia process, &c. Thus we see the instruments and vessels used for the Nessler test, condensers, balances, &c. Such a section as this one might be made more instructive if the chief impurities of water were pointed out under the heads of mineral matter in suspension, mineral matter in solution, and organic matter. It might also be pointed out how much dissolved mineral matter is contained in river and surface waters and the effects of salts of soda, lime, and magnesia; the processes of Dr. Clark for softening water, &c. The drawings of sewage farms—for example, those of Bedford, Doncaster, Barnhurst, Tunbridge Wells, Kendal, Wimbledon—form an interesting collection; chiefly the lithographic drawings contained in the Sewage Disposal Report of 1876. But a more useful feature of the exhibition are the apparatus, charts, and diagrams by G. J.

Symons and others relating to rainfall. The rain-gauges used by the Meteorological Office, and those of Symons and Howards, are shown; also a Hydrographical map of the British Isles, prepared for the Rivers Pollution Commissioners by G. J. Symons. From this very instructive map we find the rainfall of every part of these islands recorded, and that the western districts are the rainiest. Let us take a few of the figures recorded. Thus in the western part of Scotland the dark tint of blue shows a rainfall averaging from above 75 inches to 50 inches, while in the eastern part the rainfall is represented as from 30 to 40 inches. Between Solway Firth and Morecambe Bay in the Lake districts the annual rainfall is in some parts above 75 inches and in others 50 inches. In the west of Wales the figures agree. In Cornwall the average fall is from 40 to 50 inches. Turning to the eastern counties, we find an average of only 25 to 30 inches, and this represents the London district, while in the south the average is 30 to 40. Another chart of the rainfall of Wales shows that the highest figures are reached in Montgomeryshire and Merionethshire, where 80 to 59 inches are not unusual. Near Abergele, on the north coast, it is only 25, while on the coast round Carnarvon the rainfall is 32 to 40 inches. A chart by George Dines, compiled from journals during the last 60 years, represents the rainfall of London district, but many of these charts would be more useful for reference if they were drawn to a larger scale. Three valuable diagrams are to be seen bearing upon the water supply of London. They comprise data of population and increase of rateable value of the metropolitan districts. In one chart the increase of population from 1851 to 1871 is shown by shades of blue colour. We observe from it that Kensington, Paddington, Bow, Plumstead, Battersea, Norwood, Sydenham had a decennial increase in that time of 130 to 100 per cent. By another chart made in 1871 we see the relative population per acre in these districts; the scale of colours showing that in Marylebone, Holborn, and Whitechapel the population varies from 200 to 250 per acre, while at Camberwell, Greenwich, &c., it varies from 100 to 50.

Waterworks are represented by a few carefully-drawn plans and details. Bideford, Halifax, Canterbury, and Sunderland are among those illustrated. A large section, through the Whiston pumping station, is exhibited, showing the position of the strata through which the wells, tunnel, and bore-holes passed, by G. T. S. Stokes, C.E. The Henley and London Waterworks, the Metropolis Water Supply, showing Mr. Bateman's proposed service reservoirs at Edgware, with aqueducts and mains to communicate with existing distribution arrangements, and maps showing the areas drained by the upper tributaries proposed to be made serviceable for the water supply of London in conjunction with storage, as proposed in Mr. Bailey Denton's evidence, are interesting records of the work actually done towards the object in view. We see also some other schemes that have been suggested, such as that of Mr. J. Burketts, brought before the Society of Arts lately, and Messrs. Hemans and Hassard's project for supplying London and other places with water from the lakes of Westmoreland and Cumberland. These ideas have almost an historic interest to the reader of metropolitan sanitation, and we should like to see them classified and arranged in something like the order of time. Captain E. R. Calver's illustrations accompanying his recent report on the discharge of the metropolitan sewage, have also considerable value, as they indicate the suggested sewage section of the river Thames and the oscillation that is said to take place in the suspended matter during the rise and fall of the tide. We notice also Scott's process as applied to Burnley, by W. B. Bryan, A.I.C.E., and H. A. James, C.E.

Boring and pumping are illustrated by some very striking exhibits. The Diamond Rock Boring Co.'s boring at Messrs. Meux's brewery, is shown by a large section of the bore hole exhibiting the depths of different strata passed through. For instance, the section indicates 758ft. of London clay. 654ft. of white chalk and marl, 28ft. of greensand, 160ft. of gault, and the boring at 1,000ft. reaches the lower green sandstone. But the most interesting of the objects in this class are the appliances for boring exhibited by F. Docwra and Sons, which give some idea of the facilities for operations of this nature, and the power necessary to work instruments 1,000ft. or more from the surface. In one instance we see the "diamond drill head" 23in. in diameter, in which the unpolished diamonds are seen set in the rim; on another stand there is a piece of gault cut out at a depth of 966ft., with a fine fossil impression in it, besides very hard pieces of rock that have been cut through. The core tube with core extractor is another very ingenious appliance, by which the core is held and extracted through the tube. Equally striking is the "expanding chisel" used in undercutting, a tool of immense size with hinged portions which come into play when working, Messrs. Le Grand and Sutcliff exhibit some of their wheel and "field" pumps and their Abyssinian tube well; and Messrs. J. Warner and Sons have a large collection of hydraulic apparatus, pumps, valve closets, &c. Their treble barrel full water-way brass pump for deep wells appears to be a very economical kind of pump made to various sizes. One of the many patented improvements in the shape of water-waste preventers that strike us for simplicity of construction and efficient action is manufactured by Messrs. Johnson and Hailstone, of Crown Buildings, Old Broad-street, and is to be seen at work at the Palace. The advantage claimed, and which the patentees have certainly accomplished from what we have seen, is that no valves or intricate mechanism are introduced, and that the apparatus will stop as soon as it has delivered the regulated quantity of water, no matter how long the pull remains in the hand of the user; and another and great advantage is that there is an after-flush, which seals the trap of the closet and prevents the escape of any sewer gas into the house. The apparatus we saw showed the "preventer" in connection with one of Doulton's excellent earthenware closets and a lavatory basin. Among other sanitary novelties to be seen are Bischoff's spongy iron filters and the "filtre rapide," patented by M. Maigen, the last a very clever means for filtering large quantities of water. We may also mention J. F. Clarke's "patent range tap" for supplying the boiler at the same time that water is being drawn off; the boiler by this invention is always full and free from danger; also to the simply-actuated and excellent pneumatic bells manufactured by Mr. Clarke, a system which threatens to supersede the old-fashioned wire and crank contrivances, or to A. Ormsby's model showing an "artificial collecting ground" for supplying London and other places with water, which may be used where there is a rainfall, the water being collected, without regard to rivers, lakes, or watersheds. The invention consists of a space formed into parallel ridges and furrows with concrete, the surface being covered with slate, iron, glass, &c., the bottom of each furrow having an earthenware receiving-pipe for carrying away the water, which pipes lead into a collecting pipe. The inventor claims that all towns and country houses, &c., may be supplied with two gallons per head per day of pure water, the collecting surface diminishing as the rainfall increases, and that pollution, evaporation, and absorption may be prevented to the saving of one-half the rainfall which is now lost. This idea was introduced before the last Conference of the Society of Arts on national water supply. Cooper's disinfecting salts for treating condensed meat and various other sanitary appliances are to be found at the Alexandra Palace, and we believe the collection, if organised with discretion and judgment, will become a valuable aid to sanitary progress. As we have urged above, the schemes should be placed in chronological order, and the charts exhibiting watersheds, hydrogeological features, rainfall, &c., methodically arranged for reference. Finally, the exhibition must not be allowed to lapse into a mere show for patentees and crotchetmongers.

BUILDING ESTATES AND ARCHITECTS.

THE greatest amount of building activity rife just now is that carried on in and around the metropolis by a class of speculators whose main object is to cover the land with security for mortgage. Mr. Tom Brown is a representative builder in this line of business. He has constantly his eye open to secure a plot or a bit of vacant ground upon favourable terms upon which he can raise a little money to embark upon a speculation. It is only necessary that the land be near some "haunt of men," a railway-station, or the outskirts of a thriving suburb; of course, it is further necessary that Mr. Brown be a tolerably safe man, that he know a few solicitors ready to advance him money on any security he brings to them, and that they also have pocketed a few fees from previous transactions with him. Mr. Brown is further a jobber in his trade; perhaps he has been a successful bricklayer or plasterer, or a carpenter who can turn his hand to a variety of other trades. Above all, he undeniably is a shrewd man of business — knows how to turn over remuneratively a few pounds by the exercise of a little tact, and to see a bargain rather before other people have considered the contingencies arising from its possession. Our fictitious speculator has no love for architects, and architecture to him is a sort of vague and unprofitable investment in what he calls the fanciful. Not very consistently, however, if he doubts the value of architecture in theory he does not show it in practice, for he has much faith in the efficacy of stucco bay windows and doorways, carving, and cheap kinds of embellishment. He is shrewd enough to know that people like a little "style" in the front, and that a showy bay window or ornamental porch is captivating, and is well-spent outlay. The rows of suburban houses and villas to be seen at Stoke Newington, Finsbury Park, Brixton, Dulwich, &c., afford proof that decoration is not looked upon as an entirely useless expense, and that as long as tenants regard appearances builders will gratify their taste. Mr. Brown's architecture then is of a sort that appeals strongly to the minds of ordinary tenants; it must be "showy" above everything, and the more it commends itself to the vanity and selfishness of individuals the better. A high-sounding name, or a shield cut over the entrance, the arch incised with sprawling foliage, and the windows and jambs embellished with shaft and capitals carved in fictitious and fabulous forms, appeal to that large class of tenants who estimate the qualities of a dwelling by its external flashiness. We may just give an example by no means overdrawn. We saw the other day in one of the "genteel" suburbs a villa that had probably cost £700 to £800. It was set back from the road, with a neat garden plot in front. It had both a Gothic gable, adorned with a fancy barge-board, and a Classic pediment over the entrance porch! We looked twice to see if by oversight we had mistaken this amphibious medley of architectural style for anything purer than a genuine example of Elizabethan or Queen Anne, in which styles the hybrid element is occasionally introduced, with decidedly picturesque results. But no; the house was simply a *tertiam quid*, a nondescript of the most unique sort. There were clearly distinguishable Italian features upon a Gothic front. No effort was made to disguise the incongruity of the combination. Entablatures upon Classic columns, and traceried parapets upon Gothicesque shafts, irreconcileable though they are, were here brought into association. A flimsy tawdriness seemed the prevailing characteristic of its architecture.

Having glanced at what the speculative builder calls architecture, and what he has no objection to pay for in the shape of a small fee to some architectural draughtsman per elevation, we are led to remark upon the strange divorcement which takes place between the residential suburban building and architectural work properly so called. In the first instance the plan and the elevation are by no means the joint product of the same skill. There is generally an absurd incoherence between them. Not far from Herne Hill Station may be seen some detached villas built in red brick, in a "Queen Anne" style, evidently the design of an architect. The details and the carving in the brick panels are almost equal to the work of such an artist in the style as Mr. Shaw; but we look within and find not the faintest consistency apparent. The rooms are finished in the ordinary builders' style, the papering is of the commonest description, and the ceilings have the usual tawdry plaster cornices and centre enrichments. It is very easy to see how the work has been done. The elevations have been furnished to the builder, and the houses are an illustration of an unsatisfactory compromise in which the speculator and architect have been working with very opposite aims. Every feature of the house shows a want of care and thoroughness. With the semblance of substantiality and good taste without, there is a sad falling-off directly we open the front door. The partitions are brick-on-edge, with flimsy door architraves and furniture; the staircase has been constructed in the "economy with elegance" style, with turned newels and balusters and cut brackets, but with flights positively dangerous in their steepness and length, and with landings that defy the turning of an ordinary cottage piano. Stained glass to the hall windows and to the back parlour casements redeem much that is simply intolerable to any critical or artistic sense of good taste—at least in the eyes of those who are looking out for a residence. The fittings, such as kitchen range, cupboards, bath-room, and lavatory are all of the usual and "proper" kind; the chimney-pieces and grates are of the ordinary decorative type—perhaps there are tiled jambs and hearths, and it may be that an imitation dado surrounds the parlours, but all these things seem to be in conflict; they are out of keeping with the house, the colours harmonise ill with one another, and there is an evident want of agreement and concord that gives the impression that the house was built for the fittings, not the fittings made to suit the house. The rooms are got up to look at, and if to superficial eyes they are superior to their rental so much the better. The whole equipage and furniture are in accordance with this regard for worthless "elegance" and ornament.

It is very little better when an architect is connected with an estate. In this case he is generally employed to look after the interests of the freeholder, or leaseholder; he maps out the allotments, plans the houses and draws the elevations, for which he gets paid a percentage by arrangement. But the estate brings him emolument in other ways, and his chief attention is devoted to the elevation of the houses merely, and that is of a rather general and half-hearted kind. He has first to please his employers, and then the lessee or tenant, who may prefer the appointment of his own architect. In short, the estate architect seldom pays much personal attention to the architecture, and certainly none to details. He frequently exercises a very general supervision, for he finds his position oftener, than otherwise, somewhat anomalous, and one in which he can take little pride as an architect. He has no artistic scruples, the first condition of the estate being that it should be quickly built upon and let. Architectural design, then, is almost incompatible under such conditions; it is cramped, or caricatured, into capricious combinations, and we have all sorts of grotesque efforts to produce ostentatious and bedizened buildings, while truthful construction is entirely absent. We can refer to some large building estates near Dulwich and Streatham, where the names of well-known members of the profession ought to have given some guarantee of good architectural design, but where every canon of good art is violated and criticism defied. At Dulwich we see a neighbourhood of quasi-Gothic villas springing up, in which features of the most heterogeneous kind have been juxtaposed. In these erections the bay window, the porch, and the gable have been brought together in the same haphazard fashion; porches and arches resting on columns with luxuriant carved capitals, the usual cockneyism in the shape of incised arched window-heads and foliated imposts, are repeated *ad nauseam*. In the Streatham-road this gimcrack ornament is applied with a profusion and a misapplication perfectly ridiculous, and which would be a simple diversion of a harmless character if it were not that some charming sites have been spoilt. Thus we find such things as pointed arches to the porches resting upon angle columns that spring from gabled bases, and carved ornament up the salient angles of the bays! We could fill a page with a recital of extravagances in buildings of this class, houses which have cost £2,000 to £4,000 each. But the fact remains; there is no one responsible for the houses on estates let out for building; the building leases themselves are contingent on the erection of the houses, and the conditions of letting estates in lots are generally worded so as to be as accommodating as possible. It is usually, for instance, a proviso that only detached or semi-detached houses are to be built at certain stipulated costs, but the freeholder's surveyor is not very particular if he finds a large builder. On many estates the architect has simply the supervision of the drawings submitted by the lessees, and these consist, as a rule, of a block plan showing position, drainage, boundaries, with sometimes a general specification of materials and construction. These documents have to receive his approval. If elevations form a part of the conditions of letting, the architect is at liberty to modify them, or often receives a separate fee for this service. The estate architect usually receives a fee of 1 per cent. on cost of house computed from a fixed data, and also a small fee for examining the drawings and specification submitted and for his certificates and plans on deeds before the lease is granted. Under circumstances such as these, can we be surprised to find that architectural considerations are completely ignored or tampered with, and that the quality of the houses erected is of a very inferior kind? The estate is controlled really by the freeholder or his agent, the solicitor who draws up the leases and mortgages, and the surveyor who allots the land; the architect, if conscientious, has practically no voice, and our building estates near London are permitted to swamp the suburbs with bad building and dishonest and degraded architecture. It is a sort of wholesale manufacture, in which art has nothing whatever to do. On the other hand, we think the architect is neglectful of opportunity. If our large freeholders saw that the architect's work on their estates was really superior in both convenience of accommodation and elevation to that of the builder, the conditions for letting would be speedily altered to meet the case; there would be no fitting builder's or estate agent's plans to architectural elevations; a responsible architect would be appointed to the estate to supervise all the erections, and our suburbs would be rescued from the hands of mercenary estate agents and bungling builders.

THE HULL BOROUGH LUNATIC ASYLUM COMPETITION.

THE asylum of the borough of Hull, now situate on the Anlaby-road, and on the skirts of the town, being too small and otherwise unsuited for present requirements—and what is more, having been condemned by the Visiting Justices, is about to be abandoned, and a new building on a larger scale is decided upon, the site being chosen a few miles to the north-west of Hull, in the adjoining parish of Cottingham. The situation is dry and pleasant, being upon the rise or foot of the Yorkshire Wolds, which separate Hull and the low flat country adjacent from the Great Vale of York. The land has been purchased by the borough magistrates through the Asylum Committee, from the trustees of the "De-la-Pole" charity—a charity of great antiquity in the town, and one that is otherwise known as the "Charter House." From the association of its late ownership it is called the "De-la-Pole Farm," and it consists of seventy to eighty acres of land. Having made these necessary preliminary arrangements, it was decided to advertise for plans for a new asylum, the conditions being very free from restrictions. The application has been well responded to, and, as may be seen from inspecting the twenty-six sets of plans sent in, there has been great care, not to say talent, displayed on the part of the competitors with the view of carrying off the prize. These plans are now on view in the large reception-room of the Hull town-hall, where they have been carefully arranged and hung for inspection. No awards have as yet been made, and, as a matter of course, the names of the competitors are a sealed book. Some we can glean from such mottoes as a "A Humber Huller" and "Hotham" are local architects, another from having an estimate appended to the architect's report from Ed. Level, of 45, Marquis-road, N.W., is clearly the production of a non-local architect. The arrangement of the block or ground plan is very similar in every case, each competitor placing the building on the highest ground towards the north-west corner of the land. The land is a somewhat long shred, stretching east and west, from the South Wolds-road to the Hessle-road. In some cases the competitors have driven a road through this land towards its northern boundary, and they have taken advantage of this to make their north or main entrance or entrances abut upon this new road. Of course in this detail, as in most others, there is a great display of fancy, and the suggestions on this head will, no doubt, although not springing from the most successful candidates, be of considerable service to the committee. The majority of the plans show the buildings placed with the frontage to the south, but in a few cases, owing to the influence of the main road bounding the land on the west, the front elevations have been placed in that position. With one exception the plans are accompanied by reports, some of them got up with no small show of art on the part of the printer, and sent in in numbers, evidently with the object of the members of the committee having duplicates to digest in their chimney corners. In the case of "Argus," an explanatory note is affixed calling attention to a mistake on the part of the author of £10,000 in the amount of his estimate—viz., that it should be read £56,160, instead of £66,160. This course of correction is followed by "Lucidus Ordo," who wishes the term "fittings" to be understood as applying to furniture, bed-linen, and general stores. Commencing from the south-east corner of the room we find the plans hung in the following order, which is the order in which we propose to review them:—

1. "Unto the Last," 5 mounted sheets of drawings.
2. "Complete," 6 mounted sheets of drawings.
3. "Utilitas," 11 unmounted sheets of drawings.
4. "July 21st," 9 mounted sheets of drawings.
5. "Quis," 4 mounted sheets of drawings.
6. "Halfpenny Stamp," 10 mounted sheets of drawings.
7. "Experto Crede," 9 mounted sheets of drawings.
8. "Experience," 6 mounted sheets on cardboard.
9. "En Propriis," 9 mounted sheets on frames.
10. "X," 17 unmounted sheets of drawings.
11. "O" (in red), 4 unmounted sheets of drawings.
12. "Merlin," 6 unmounted sheets of drawings.
13. "Pro Salute Mentis," 3 unmounted sheets of drawings.
14. "Lucidus Ordo," 21 mounted sheets of drawings.
15. "Argus," 10 mounted sheets of drawings.
16. "Experientia," 8 mounted sheets of drawings.
17. "Plan," 6 mounted sheets of drawings.
18. "Comme il Faut," 6 mounted sheets of drawings.
19. "By Sunshine All Day," 7 mounted sheets of drawings.
20. "Light and Air," 8 mounted sheets of drawings.
21. "Sweetness and Light," 9 mounted sheets of drawings.
22. "En Echelon," 8 mounted sheets of drawings.
23. "Thought," 16 mounted sheets of drawings.
24. "Bon Accord," 4 mounted sheets of drawings.
25. "A Humber Huller," 15 mounted sheets of drawings.
26. "Wotham," 4 mounted sheets of drawings.

There appears to have been no restrictions as to colouring the plans, to furnishing perspective or bird's-eye view; or to getting the same up in line or sepia, or colour. In consequence there is a wide range under this head: some contenting themselves with furnishing elevations in simple line, others got up in taking colours, backed up by highly-wrought perspectives, the colourings of which are truly works of no mean art.

No. 1 is a work in the Domestic Gothic style, very unpretentious in character. We see in one part transomed and mullioned windows, clearly of Tudor character; in another, plate tracery beneath highly-pointed arches, and such details as spires in keeping therewith. The author classifies it, "Vernacular in style, intermixed with Gothic." From this it is clear the strong point of this competitor is not in the elevations. The block plan is neatly disposed on the land, the end of the building being toward the western road, where the residence of the superintendent medical officers is placed, attached to the main building by a short corridor, a plan the author highly commends. We here find two lodges placed opposite this house, which has no pretence to be called the principal entrance, for that is placed some yards to the north and is—if we may coin a word—"lodgeless," an arrangement we fail to see the merits of. The principal elevation is towards the south, and it has for its centre a dining-hall 80ft. by 35ft., to seat 300 persons, and provided with a raised platform for concerts; above is the chapel, corresponding in size. This building projects its entire width beyond the true line of frontage of the asylum. The roof is ornamented with three gables, and flanked by two towers of great elevation, capped with high-pitched roofs in two stages, and dotted with small chimney lights. The ground-floors of these towers are occupied as sitting-rooms for the matron and the assistant surgeon, the first-floors as bed and dressing-rooms, and the second-floors as bath-rooms for general use. From this block the wings stretch out east and west to a great length, and are each divided by other blocks devoted to day-rooms, which are well lighted with bay and other windows. The wings thus divided by these projecting blocks are each about 22ft. wide, 12ft. of which are used in corridors, the remaining 10ft. along the north side being used as single dormitories 7ft. in width. It will thus be seen that the arrangement is to devote the whole of the south front to corridors, day and attendants' rooms, the latter being situate at the extreme end of the wings, and to place wards as dormitories to the north, from which quarter their light and air is to be obtained. In the case of the dormitories, constructed to contain beds for ten and four patients respectively, and which are situate in the rear of the day-room block, there is a somewhat crowded appearance. The first-floors of these wings are counterparts of the ground-floors; but the second-floors, which only extend half the length of the wings, are used as associated dormitories for quiet and imbecile patients. The centre in the rear of these main buildings is mainly occupied by the kitchen, 35ft. by 40ft., hedged round with a maze of small offices, from which it is clear there is neither light nor air other than from the roof. In the rear of this group, and in a line with the main buildings, are stretches of one-story corridors, lit from the north and south sides. These communicate with other and distinct blocks of property for sick patients; these have the dormitories fronting to the south, and the corridors to the north—an arrangement that, to our mind, is the most preferable. These blocks are placed behind the extreme ends of the front wings, with which they are connected on the ground floor by corridors, a plan that cuts the ground up into courts, which are called "airing courts," "court-yards," &c. These blocks, like the termination of the front wings, are only two stories high. In the rear of all these buildings are other offices, such as wash-houses, workshops, stores, and receiving offices, over which are other dormitories, committee rooms, &c. These erections are mainly one story in height, and are connected with extensions of the transverse corridors of the main building. In the centre of these buildings, which form the northern elevation, is situate the main entrance opening into the system of corridors—an entrance which, since it is the only one, is far too small and cramped for such a pretentious group of buildings.

The author of these plans proposes warming by open fires in the wards, and by hot-water on the high-pressure principle. The ventilation he proposes to be from the towers and windows, and the extraction of the vitiated air by open fire-places, and in some cases by extracting flues and gas jets. The building he proposes to construct in red bricks, and to relieve them with best "Idle stone" dressings and blue bricks. The estimate of the entire work, with every requirement, is placed at £47,000. This competitor appears to have forgotten one of the requirements laid down by the justices, viz., a recreation-hall.

No. 2 design is similar in the disposition of block plan to No. 1, but the drives, from being taken all round the building, are more pretensious. In an architectural sense the elevations here submitted are very unpretentious; the main front to the south is made up of a centre block, and three other blocks stretching to the east and west, making seven blocks in all. They are all two-story constructions of red brick, the style, although possessing some features of "Queen Anne," might fairly be referred to any of the Georges. The central block has two projecting bays, the adjoining blocks forming the wings, and which are connected on the ground floor by corridors or lobbies, have square and other bays singly or in duplicate; but the main features are square-domed towers, having slate louvres in the windows, the uses of which are as stores for water and extracting chambers for ventilation. There is no perspective drawing with these plans, but there is an elaborate basement plan showing a system of tramways under the corridors, the object of which is not very clearly shown. The arrangement of the frontage is a corridor 12ft. wide, running the entire length of the buildings on the ground-floor. The central block, which is devoted to the administering departments on the ground-floors and servants' bedrooms above, is wholly constructed on the south side of the corridor. In the rear of this block are extensive one-story buildings, the main features of which are two dining-halls (male and female), 65ft. by 38ft., to dine 186 persons, allowing 28in. to each. These run north and south, and are divided by an open court 11ft. wide, from which, with other courts on their east and west sides, they obtain their light. Round the whole are corridors, flanked by store-rooms, lavatories, &c., which in their turn are embraced by another and a larger system of corridors.

The blocks right and left of the centre block are the infirmaries, which have each day-rooms and single-bedded rooms to the south, and dormitories and bath-rooms to the north. The courts in the rear are used as the sites of the recreation-hall, a building 70ft. by 40ft., with a western extension of 20ft. for a stage, and also of the chapel, which is duly oriented, and capable of seating 250 persons. It has an apsidal end, with a southern vestry and a northern organ-chamber, the chancel having stalls for 24 worshippers. A well-drawn section is given of this part of the chapel, but the details are very poor. The second blocks, right and left from the centre, are devoted to epileptic cases. They have day rooms and single rooms in the front, and dormitories, 65ft. by 34ft., in the rear. In these are placed 24 beds and five sleeping cubicles. The beds in this, as in all other cases, are kept clear of the walls, and are screened at the heads, an arrangement in associated dormitories that is highly commendable. The blocks forming the extreme ends of the wings are devoted to chronic cases, and these have two day rooms on the ground-floor, and dormitories for 24 patients in the rear.

The first floor is devoted to dormitories very creditably arranged. In the courts in the rear are erected dress and bath rooms communicating with the northern corridors. To the north of all these buildings is a large corridor running parallel with the main buildings, in the centre of which stands the main or north entrance, with porter's day and bedrooms on either side of the hall. This, strange to say, is but a one-story building; situate at the north-west corner of the plan, to which it is connected by a corridor, is a well-arranged and commodious house for the resident medical superintendent. East of this building are the wash-houses, lavatories, &c., which are commodious and well-arranged, over a portion of which is a day-room, 40ft. by 24ft., and a dormitory, 85ft. by 28ft., for twenty-four beds. At the extreme north-east are the stables, shops, dissecting-room, mortuary, bakehouse, &c., over a portion of which is a day-room and dormitory similar to the last described. Turning wings to the north entrance are male and female side entrances, to which are attached receiving rooms and other necessary offices. In the laying-out of this plan the ground is cut up into fourteen squares, the dividing lines being mainly one-story corridors. The merits of this plan are considerable; its weakest points are the poor and weak character of the architecture, as displayed in the elevations and the straggling character of the buildings. The author claims as its merits having the single sleeping-room placed toward the south.

The warming is proposed to be by open fires where possible, in other cases by hot-water on the high-pressure principle, each block to be warmed separate, but fed from one centre. Ventilation to be by doors and windows during the summer months, and in winter by heated pipes to warm the air as it enters, and when foul to be drawn to extracting chambers in the towers, which are to be fitted up with warm piping. The estimate, to exclude road-making, is £50,267, but this can only be a rough approximation, as the author admits he has not had opportunities of extracting the quantities.

No. 3. This competitor, with the exception of placing his medical superintendent's residence as a detached building in the extreme north-west of the land, disposes of the ground in a similar manner to that adopted by No. 2. The frontage of the asylum is broken up by projecting wings from the centre somewhat resembling the letter ⊟ with the chord line extended in the form of east and west wings. The south-west corner is devoted to male epileptic patients, and the south-east to females. The centre block is made up of officers' departments and the rear with administrative offices connected with the north entrance. To the right and left are placed the dining-halls, 82ft. 6in. by 39ft., and the male and female infirmaries. The chapel is built as a projection from the main front, and is disposed in the north-east corner of what we may call front quadrangle—a building that is balanced by a one-story block of offices devoted to the purpose of the chaplain's rooms, the library, and club-room. The author of this design suggests that this block might, in case of need, be used as the recreation-hall, which he fails to otherwise provide. The general arrangement is a group of one-story buildings connected with distinct blocks of patients' wards and offices, which in each case are three-story erections. These are mere duplicates of each other, the ground-floor being used as a day-room, 56ft. by 30ft., and dormitories of the same size for 24 patients, the beds being arranged in three rows, the outer ones abutting upon the walls. In connection herewith are several bath-rooms, wards for excited patients, &c. On the first floor are day-rooms for 60 patients, and on the second floor dormitories for 48 patients, with six separate or single sleeping-rooms, attendants' rooms, &c.

The elevations, as drawings, are very carefully prepared, and, as may be expected with such a broken line of frontage, a "bird's-eye," view of the whole building is furnished. The architecture is plain and simple, being of the Gothic type somewhat freely treated; with the exception of the chapel, which has a very picturesque bell-cot carried upon the south-west buttresses of the nave, there is not much to notice in the way of pronounced design. The north entrance partakes somewhat of the Renaissance; but on the whole there is not much to say in the way of objection to the character of the design. This plan may be said to be based upon a system of one and three-story buildings, the latter in detached block. The patients, with very few exceptions, are accommodated with sleeping-apartments on the third stories, and this is an arrangement that will no doubt give great inconvenience in the working of the asylum. Another arrangement we do not appreciate is that of having large associated dormitories; in this case they are grouped in numbers of 24 and 48, without any attempt to seclude or screen the same. In this respect the arrangement is inferior to that of No. 2 design. Another detail we condemn is the kitchen, which is far too small for such a large establishment. But its worst feature is being entirely hedged round with other offices, and of necessity confined for its light and air to the roof; the adjoining scullery is better provided in this respect, having windows opening into a small court. Another fault to our mind is, that there is practically no centre to the main or south elevation; as noted, this is occupied by a suit of offices which are but one story in height. This cannot fail to give the whole asylum a dwarfed appearance, and to confine any dignity of elevation to the great three-story wings.

For warming the author recommends open fires or "Steer's hot-water grates," of which he speaks very highly. As a rider on these, he suggests hot water from the boiler, or high-pressure pipes arranged in separate blocks. He proposes to carry his vitiated air into the roofs, and to extract it therefrom with archimedean screw ventilators. Ventilation is suggested in some cases by sun-burners in the ceilings of the apartments. The estimate for the whole of the buildings is given as £80,000, which we think is more than reasonable for brick buildings in such a district. The cost will, no doubt, be brought up by providing fireproof floors, composed of concrete arches, carried upon rolled iron girders, with wood floors above, but in other respects we fail to notice anything likely to swell the cost of construction above an ordinary point.

(*To be continued next week.*)

THE ARCHÆOLOGICAL CONGRESS AT YARMOUTH AND NORWICH.

[FROM OUR OWN REPORTER.]

WE resume the detailed report of the Congress, commenced in our last issue, at

WEDNESDAY

in last week, by a summary of the paper read by Mr. J. L. Clemence, at and concerning

ST. MARGARET'S CHURCH, LOWESTOFT.

A fire in 1606, at the parsonage, destroyed the old parish registers of Lowestoft, so that there are no ancient documents concerning the church to assist in unravelling its history. The church consists of a west tower, nave, north and south aisles, chancel, south porch with parvise, and a crypt under the chancel. The oldest part of the church is the tower, which has no higher antiquity than the reign of Edward II. The lower part of this tower, judging from the mouldings, was built between 1307 and 1380. It was probably built to a more ancient structure, considerably smaller than the present edifice, referred to by a charter of Henry I. In 1870, Mr. Clemence, while removing old pews and walls during his restoration, came upon the foundations of the original church, which extended no further than the third bay of the present church. The original church apparently had no aisles. It was 54ft. long and 18ft. wide, and its height was shown on the east face of the tower. The architect of the present church evidently desired to perpetuate the size of the old one, for on the second buttress from the porch he placed a rose, and the clerestory windows up to that point he made with two lights, while those eastward have three. Again, within the church, at the third pillar of the north arcade, is a pedestal which at one time supported an image. Was it of St. Roche? for Gillingwater mentions a bequest to support a light before the image of the Saint. The present nave, aisles, chancel, and porch, are of the time of Edward V. (1483), when the tower was raised and the wooden spire, covered with lead, was added. Perhaps the church was built by Bishop Scroope, who after quitting the bishopric of Dromore, Ireland, and wandering for many years, became vicar in 1478. The length of nave is 105ft., and of chancel is 52ft., the width of both is 22ft., and across aisles 57ft., the tower is 70ft., and the spire 50ft. high. The porch, a good specimen of those of Norfolk and Suffolk, has a good deal of flint tracery of good character. The entrance has shields, with symbols of the Passion in the spandrels, and within some excellent groined work; the centre-boss represents the Trinity. Tradition says that two sister maiden ladies, Elizabeth and Kate, lived in the parvise for many years and bequeathed a piece of land and a well, still known as the Basket well—locally supposed to be a corruption of Bess and Kate—to the poor of the town. At the north-west angle of tower is a long narrow opening (once closed by a wooden door) where the processional crosses and banners were kept. There are similar recesses at Rushmere and Catfield churches. The small tower arch, of the Decorated period, is another evidence of the smallness of the old church. The font is of the Perpendicular period, panelled and filled with figures, which in 1644 was mutilated. It consists of an octagon bowl on base of same form; panelled with sculptured figures, well executed, but now indecipherable. The inner arch and jambs of the north door, of the Decorated period, is the only part of the old church that was retained. The north and south arcades are well designed, The chancel was formerly separated from the nave, of which it is but an elongation, by a rood screen, which disappeared during the visitation of Francis Jessope in 1644. The roof was restored about 40 years since, when the parts appear to have been jumbled; the cantilevers between the ugly hammer-beams seemed to have formed part of the old rood screen. The crypt, which has groined vaulting, probably had an altar in a recess between the windows. The church had a handsome piscina and a plain sedilia, with the unusual feature of a level seat. The only interesting monument is that of Bishop Scroope, sometime Bishop of Dromore, who died here in 1491, aged about 100, and was buried on the north side of the chancel. Only a few brasses remain: one to the memory of a member of the Fishmongers' Company, and two others represent headless skeletons in shrouds. But up to the visit of Jessope, assistant to the notorious Will Dowsing, this church had many brasses. The Rev. James Rowse, vicar at the time, says of Jessope's doings: "Thear wear taken up in the middle alley twelve peeces belonging to twelve several generations of the Jetters;" also, "Hee took up in our church soe much brasses as he sould to Mr. Josiah Wild for five shillings, which was afterwards, contrary to my knowledge, run into the little bell that hangs on the town house." That bell was made by John Brand in 1644, but it was recast in 1859. The church had been restored within the last ten years, when the south aisle and its arcade were taken down and rebuilt because unsafe, and the author thought all members would agree with him that the work was done so well that it was almost impossible to tell that they were not in the same state as when left by the original builder.

After the reading of this paper the party were driven to *Corton Hall*, where they were cordially received and entertained by Mr. J. J. Colman, M.P. The hall is a modern one on the site of an Elizabethan mansion, and is placed on the verge of a cliff overlooking Lowestoftness. Among the curious objects collected by Mr. Colman are a series of oval oak panels, boldly carved in high relief, with representations of the Crucifixion and other Scriptural subjects. These were formerly in one of the rampart towers of Norwich city walls, but now adorn a pair of folding doors in the drawing-room. A warm discussion occurred in reference to a display of china ware, reputed to be of Lowestoft manufacture, but which Mr. Lambert, F.S.A., and others considered from its outlines must have been fashioned in India, and sent to Lowestoft merely for glazing; and the fact that the colour has been applied after calcination was evidenced in support of this theory. Incidentally, it was mentioned that soon after the pottery was established in Lowestoft it was found that the clay of the neighbourhood was entirely unsuitable to the manufacture, and kaolin was imported by sea from the south-west English coast and from the Netherlands, until the business so strangely maintained was exhausted. In reply to Mr. Lambert's hypothesis, it was admitted that undoubtedly much ware was imported ready baked for painting, but that the local potters strove to imitate Oriental ware in their designs. After inspecting many pictures of the Norwich School, and partaking of tea and fruit, the visitors rested in the beautiful hanging gardens carved out of the cliffside, and having hastily inspected in the museum at the end of the grounds, fossil bark dug up by Mr. Colman during the past few weeks in the submerged forest below the hall, left bare by extraordinarily low tides, a choice collection of local birds and tertiary remains found in the neighbourhood, the members drove back to Yarmouth. In the evening papers were read at the Town-hall on "The Saxon Shore in Britain," by Mr. C. H. Compton; and "Recent Finds of Coins in Norfolk and Suffolk," by Mr. H. Prigg.

THURSDAY.

On this day the members were the guests of the President, Lord Waveney, F.R.S., who provided carriages and a special train for inspecting the antiquities upon his estate, in an angle of Suffolk, between Harleston and Bungay, Unfortunately the attendance of members of the B.A.A. and the local societies of Suffolk and Norfolk, over 200 in all, was far beyond what had been anticipated; the carriage arrangements broke down, and one of the vehicles—already too few—was disabled by the running away of a horse. The consequent delays rendered it necessary to cut down the programme, the pursuit of archæology succumbing to the superior claims of the enjoyment of hospitality.

From Harleston the members proceeded by road to

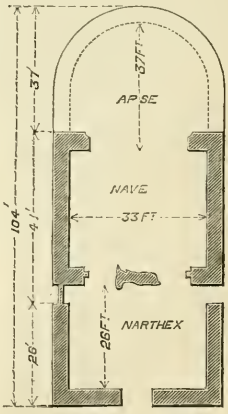
WINGFIELD CHURCH AND CASTLE,

at each of which papers were read by Mr. R. M. Phipson, F.R.I.B.A., of Norwich. The nave of the former building is now undergoing restoration, the seats have disappeared and scaffolding and building materials temporarily disfigure the wide and well-lighted interior. The church is a handsome one, amply lighted, wide, and lofty; the most attractive features are the arcades on south side of chancel, the voussoirs of which are decorated with carved shields and other designs, and the effigies of the Wingfields. The present church at Wingfield, Mr. Phipson explained, was built partly in the 14th century and partly in the 15th. When a collegiate church had been founded in 1362 the rebuilding of this church was commenced and was gradually carried forward, being chiefly finished by 1380. Thus the tracery in the north chapel or vestry and the doors and arches of the nave are Decorated, while the arches and piers of the chancel, as well as the east window, are Perpendicular in character. The chancel is spacious, and has seven clerestory windows, an unusual number for a Suffolk church. The east window (of five lights) still retains some of its early glass, consisting of the arms of the De la Poles, Staffords, and others. The roof is entirely modern, and so also are the stone corbels from which the principals spring. On the south side of the chancel are three arches, one wider than the others. The narrow arches contain in the mouldings the badges of Wingfield (a wing), and Stafford (a knot), and all have plain shields, which were probably emblazoned. The carving added to pier capitals is modern. The stalls and screen, of Perpendicular work, remain in the chancel. The miscreres have carved foliage underneath, varying slightly in design. The Perpendicular screen in the chancel arch has been sadly mutilated; but the bottom panels remain, and vestiges of the figures of SS. Peter and Paul are visible. There are fragments of a piscina, and clear evidences of an altar remaining in the chancel chapel on the south side. On the north side of the chancel is a chapel, and beyond it a vestry of rather peculiar construction. Over it is an arched room, reached by a ladder from the ground floor, and a Perpendicular screen at the eastern end. In the inner wall of this upper room are squints, doubtless to enable the priests there to see the altar. In the east window of the vestry is some good early glass. The nave has five elegantly proportioned but Late Decorated arches, surmounted by a Perpendicular clerestory, with five windows on each side. There has been no alteration of the clerestory, this change of style having been a gradual one, as the walls went up. The roof consists of three bays, with trussed rafter principals between each bay. The main braces are supported by angels holding shields, now plain, but once emblazoned. Both aisle roofs are modern. The north and south aisles have good Perpendicular and Decorated windows and doors. On the south is a good Transitional Decorated porch with a niche. The flint tower is bold but plain. The steps to the rood screen remain. One can picture the glorious appearance of the church when this elaborate rood-screen spread from north to south, and had beautiful chapels on each side. Of the monuments, one is to Sir John de Wingfield, erroneously assigned to the Duke of Suffolk, but the architectural work and the character of the armour show that it was 50 or 60 years before his time. Another tomb is to the memory of Michael de la Pole, 2nd Earl of Suffolk, who built Cawston church, in Norfolk (c. 1415). The figure, as well as that of the countess, is of wood, and has been pronounced by the Rev. Mr. Tyson to be the finest of the kind existing. Another monument is to John de la Pole, who married Elizabeth Plantagenet. There are two figures, one in marble and the other in alabaster. The wife is represented as a widow. There are three matrices of brasses in the chancel, which doubtless were to the memory of the 1st Duke of Suffolk and his sons.

Mr. Phipson delivered an address on the lawn of the castle, which he explained at the outset is not a castle. It was originally a moated manor house, but after it was erected, the first Earl of Suffolk, Michael de la Pole, obtained a licence to crenellate it in 1384. Before going into the history of the building, the lecturer gave the pedigree of the families who have possessed it. It is certain that the Wingfields were settled here before the 13th century, but it is not clear that they enjoyed it uninterruptedly, for one Richard de Brews, a very powerful family in the eastern counties at that period, possessed the estate in 1328. The trustworthy history commenced with Sir John de Wingfield, who died in 1362, and by his will desired the church of Wingfield to be made collegiate for a provost, master, and several priests. The college was duly built, was valued in 24 Henry VIII. at £69 14s. 5d. per annum, and after the Dissolution became part of the augmentation which Edward VI. made to the Bishopric of Norwich. The master and others subscribed to the King's supremacy in 1534. Sir John Wingfield, who was a soldier in the French wars, left one daughter, Catherine, through whom the property passed to the De la Poles, by her marriage to Sir William of that name. This Sir William de la Pole was son of a Hull merchant, and became Lord Chancellor of England and a Knight of the Garter in the reigns of Edward III. and Richard II. He was impeached for fraud, fled to France, and died an outlaw. The monument of his son, the 2nd Michael Earl of Suffolk, had just been seen in Wingfield Church. The most illustrious of the race was William, 4th Earl, who was a great soldier, and became 1st Duke of Suffolk, and married Alice Chaucer, grand-daughter of the poet. It was alleged, however, that he had surrendered, for bribes, Anjou and Mayne to the French, and he was banished for five years, but just as he set off for France he was seized by a man-of-war, carried to Dover sands, and there beheaded. His body was buried at Wingfield, and marked by a monument—probably a brass, for it cannot be identified. A fine monument to his son John, second Duke of Suffolk, and to his wife, Elizabeth Plantagenet, had been seen in the church. The family name became extinct in 1525, and the castles and estates having reverted to the Crown, passed through the hands of the Catelyns of Norwich, the Lemans, and the Berners, from whom it was purchased in 1856 by the late Sir Robert Adair, father of the president for the year, and their host, Lord Waveney. As to the castle, he produced a rough plan showing the outline of the inclosed space, which is 83 yards square. At the four corners were octagon turrets, and a considerable portion of these on the south side still remain, but the foundations—and that only in part—is left of those on the north side. Round the whole runs a moat about 10 yards wide, which still contains fish. On the northern side of the moat, the earth taken out has been thrown into a long mound. In the centre of the south side is the entrance gateway, and at its four angles are octagon and semi-octagon turrets. In the north-west turret there is a fairly spacious circular staircase, and in the other turrets small circular staircases, commencing from the first-floor only, leading to the lead flats. Doubtless these recesses were used as small ante-rooms to the large central chamber over the archway. The central turret windows have been sadly modernised by a very injudicious repair of the stonework, and by the insertion of large sheets of glass. On the east side of this was a bridge of most peculiar construction. When the author first saw it, more than 30 years ago, it was still in its primitive condition, but in a dangerously dilapidated state; there were the old oak timbers, the large wrot chain and the huge boulder-stone hanging from it, which exactly balanced the bridge, and the whole moved up and down with a slight touch of the hand. In place of this there is now a thin deal substitute, without any balance at all. When the Catelyns acquired the place, in Queen Elizabeth's time, they seem at once to have begun altering it, and to them may be safely ascribed the very fine old brick chimneys and shafts, most of which are still remaining on the domestic buildings. They are in detail exceedingly like those at Barsham, Norfolk, and might have been made from the same moulds. The brick doorway to this western part of the house is of the same period, as is also the upper portion of the staircase, which is formed of solid thick blocks of oak. The oak entrance-gates, which have been substituted for the portcullis, are of the same date, and are very good examples of Elizabethan work. Over this part of the house is a niche containing a rough half-figure of wood, which Mr. Phipson hoped and believed was of no antiquarian interest, for it has been entirely spoilt by the painting and "picking-out" it has received of late.

SOUTHELMHAM OLD MINSTER.

This ruin was reached after a long drive through Fressingfield and Metfield. It consists of a few rough walls of rubble standing within an entrenched quadrangular space, now covered with underwood, and in a spot quite retired from public roads and lines of communication. Not a trace of tooled masonry exists in the thick rounded masses of conglomerate, which are bonded by intensely hard mortar, wherein some members believed they detected the powdered brickdust so constantly used by the Romans in the earlier years of the British occupation. The walls rise in places to a total height of some 13 or 15ft., and are partially concealed by ivy as well as trees. Close to the ruins, Lord Waveney read and commented on a paper contributed some years since to the Suffolk Archæological Institute by a Mr. Wooddard. The remains, he contended, were those of a Burgundian church, established in what was undoubtedly a Roman camp. They oriented N.E. by E., and had a total length of 104ft. by 33ft., consisting of a western galilee 26ft. long, communicating by two openings on either side of a central jamb, with a nave of 41ft., which opened by a comparatively wide arch into a circular apse, 37ft. to wall. (See plan.) Both the 1st and 3rd portions were characteristic of Burgundian churches. Durham Cathedral exhibited on a large scale the galilee, which was considered less holy than the church itself, and wherein relics were exhibited. The apsis was also a feature of remote antiquity. It was evident that the church was never finished, for the putlog



holes remained unfilled to this day; further than this, although the site had been excavated 5ft. deep, and the neighbourhood had been ploughed over for centuries, no traces of floors or of other buildings could be discovered. Although it was known in old documents, and by tradition, as the "minster," or the "old minster," it did not follow that this was ever a monastery. The term was often applied to the largest church in a district, and fortified monasteries, such as this, with its mound and vallum, were unknown in this country. Its preservation to this day was probably due to the fact that the whole of Southelmham belonged to the Church from an early period, that it was formerly wooded, and that its almost only ancient use was for a chase. Mr. Parker and others agreed in assigning the building to about the year 1000. Mr. Loftus Brock said, in order to avoid prejudice, he had abstained from reading any description of the ruins in modern books, but had striven to interpret them by close examination of the actual remains. It was certainly not unusual to find a Saxon church within a Roman inclosure: one had existed at Dover Castle; there had been others at Porchester and at Burgh Castle; Mr. G. H. Birch had found traces of a similar association at Kingsbury, Middlesex; and at Bradwell-juxta-Mare, Essex, one existed on the very wall of a Roman settlement. Further, here they had a building, certainly not Norman nor Post-Norman either in constitution or arrangement. The Norman arch was so enriched and peculiar in East Anglia, that its absence from any part of the ruins amounted to negative proof, but the plan it could be unhesitatingly maintained was not Norman. The earliest British and Irish churches assimilated more nearly to the Greek than to the Latin plan, in accordance with the first introduction of Christianity into these islands, and the narthex was an Eastern, not a Western feature. Again, this nave was approached by two entrances, and was itself a square, neither of which were Norman features. True, the apse was, but it was derived from older sources—the churches containing Saxon work at Brixworth, Northamptonshire, at Wing, Bucks, and at Worth, were all apsidal-ended. They had thus a design which was not Norman, a plan which was Saxon, and a total absence of historic evidence. As an architect, he believed that the hand of man impressed its testimony as to the class of mind which laid the stones and arranged their order, and he, therefore, considered the point was fairly established that this little building was erected on the site of an earlier Christian temple, and that it was abandoned prior to the arrival of the Normans. At the close of the addresses it was stated that some Roman urns had been found in the immediate neighbourhood of the entrenched mound. This being so, some members, after examining the ruins, suggested that this might be deserted Late Roman villa; while might not the putlog holes, and the absence of wrought stonework be accounted for on the supposition that all the dressings have been pilfered during the past eight to twelve centuries by the inhabitants? While the character of the rubble work is not unlike Late Roman work, the unmistakable semi-circular termination to the building presented a crux to those raising the secular theory, and the members returned, many of them still undetermined as to the origin, character, and use of the building. The day was too far spent to allow of the acceptance of Lord Waveney's invitation to Flixton Hall, or to inspect the Edwardian Castle and fine churches of Bungay, and the visitors returned from the latter station by special train to Yarmouth.

In the evening Mr. Brock read a paper on "The Round Towers of Suffolk and Norfolk," of which we shall probably publish a summary in an early issue; and Mr. Henry Prigg read a paper on "A Hoard of Bronze Implements, &c., from Reach Barwellfen."

FRIDAY

was appropriated to a long journey by rail and road to towns on the south-east coast of Suffolk, decayed and deserted in consequence of the changes in the outline of the shore and in the place of manufacture of woollen fabrics. At

DARSHAM,

the place at which the railway was quitted for the highway, a hasty visit was paid to the small church (All Saints') restored by the late Mr. E. A. Hakewill. The church which is one of those mentioned in Domesday, has some "long-and-short" work in the tower, and built into the north wall a rude doorway arch with mutilated mouldings, but which, although pronounced Saxon by several members, appeared quite as likely to be a defaced specimen of well-developed Norman such as actually exists, with its zigzag, lozenge, and roll members tolerably complete, within the south porch. Beneath a Perpendicular bowl of the font is an Early English stem. The original font the rector stated was removed from Darsham House some years ago to Sibton Abbey ruins, where it now remains. On the north-west angle of the chancel is a low side window in the position often called that for lepers. The pulpit is a small Jacobean one. There are three 17th century brasses, the most interesting being that of Mrs. Anne Bedingfeild, 1641, who is placed with hands free instead of clasped, the sinister holding a handkerchief. The dress agrees with the very late date. A long drive over Theberton Heath brought the party to

DUNWICH.

Owing to the absence through illness of Mr. Horman Fisher, who was to have read a paper at the church, the visit to this ruined city, now a village of a couple of hundred inhabitants—was rendered flat, stale, and unprofiable, except that Messrs. Phipson, Brock, and Morgan, at short notice paraphrased the guide books. That it was the Cito Magnus of the ninth Antonine Iber, or at least, was a camp of the Romans, was evidenced not only by documentary references, but by the production at the residence of Colonel Barne, of indubitable coins and iron, and fictile fragments found within the city limits, as well as by the records, and by miliary roads which lead from it towards Bury and Norwich. By the Saxons it was known as Dunmocceastre, and here Siegeberht, king of the East Angles, constructed about 630 a palace for himself and a church for Felix the Burgundian, first bishop of the East Anglian see. This diocese was divided into two after the third bishop (673), but there were sixteen bishops of Dunwich. As a Parliamentary borough it returned two members from the reign of Edward I. till 1832. During the Edwardian wars, Dunwich figured prominently as a port, but in the reign of the Third Edward the harbour shoaled, and 400 houses were speedily destroyed by the encroachment of the sea. This process of destruction which has been in progress for more than a dozen centuries, is accurately traced in recent times by maps and documents. Between 1535 and 1600 four churches disappeared, in 1677 the sea forced its way into the market place; in 1702 St. Peter's church was undermined, and was followed a quarter of a century later by its churchyard. Mr. Morgan read a description of Dunwich in 1590, from a Harleian MS. in the British Museum, and refuted the popular error that there were formerly fifty-two churches in this city, as the names and dedications were preserved, and it was certain there were not more than six, of which the dismantled ruins of one remains; there were also convents, a hospital, town-hall, and other religious and public buildings. A plan of Dunwich made in 1587, and exhibited by Col. Barne at his house, showed that even at that time the river ran inland for a long distance, parallel with the coast, having its outlet north of the city, and the church of All Saints', now on the edge of the cliffs, is delineated at a considerable distance from the sea, with many streets and buildings between. At present the only architectural remains are those of All Saints' church, the monastery of the Grey Friars, and the chapel of St. James's Hospital for lepers.

The *church* is a Late Decorated edifice, consisting of nave of five bays, with north aisle, with chapel beyond, choir of three bays and fine west tower, with panelled buttresses and parapet. The church was dismantled a century since, partly because the citizens expected the chancel soon to fall down the cliff side, which is being undermined, partly to sell the old materials, and it is now a roofless ruin, only the arcade and south wall of nave and the rubblework of the tower remaining standing. The churchyard wall has quite disappeared. Indeed since our previous visit nine years since we notice that the ruins have diminished still further, especially on the north side, and before long the whole will doubtless be reduced to shapeless masses by small pilferings and winters' gales. Mr. Brock referred to the evidence of changes which have passed over the church. In a window space on the south side of nave (third from east) may be seen within a Decorated arch one of slightly later date, and the whole of the tracery was taken out and replaced forty years later by Perpendicular work. Again, on the east face of tower there are the grooves formed by two roofs of varied pitch, the more depressed one being evidently the last. Some of the details of panelling and carving are well executed; one of the loose fragments lying in the nave is a portion of a cornice (c. 1450) with a Tudor four-leaved flower in bold relief upon it. In the base of the tower Mr. Brock pointed to some long and short work and to some small windows which he considered might be Saxon. In the tower Roman bricks are re-worked up.

The ruins of the *monastery* were not easily inspected; they are in the midst of a field of ripening corn and consist of a series of arcades and walling, all of Henry I.'s period, of rubble, faced within the building with plaster, and now covered with an impenetrable veil of ivy. The principal and smaller gates into the field have stone jambs and moulded heads of Middle Decorated character.

The *chapel* of the *lepers' hospital* is far more interesting. As it stands it consists of walls, wall-plate high (about 13ft.), again rendered obscure by ivy, of an apse with three lights, a short chancel, with recess for sedilia, the base of chancel arch, and slight remains of walling westward. The whole is Transitional Norman work of good type, with cushioned caps to shafts and jambs, and a dado of blind semi-circular arcading has been carried round the building. The chapel is railed in on the west, and seems to owe its preservation to the fact that in the centre is a large sarcophagus covering the Barne family vault. Close by is the modern chapel of St. James, a building erected in execrable taste about forty years ago, with shallow west tower, flint work backed with red brick, and what is supposed to be Flamboyant tracery in the small windows. At the present time a chancel is being added in red brick faced with flints for Mr. Barne, and the builder (Mr. Thornton, of Dunwich) is responsible for the statement made to us that no architect is being employed in the job. It is scarcely possible to disfigure the present edifice. At the back of these 12th century and 19th century chapels a labourer was doing a flourishing trade by selling to archæologists, literally at a shilling a head, the crania of deceased lepers and other parishioners; indeed a miniature ossuary was displayed on sale in a zinc pail. Better cremation than for one's bones thus to be made a market of by future antiquaries and rustics.

BLYTHBURGH CHURCH,

Together with those of Southwold and Walberswick (the latter now in ruins), completes a trio of Late churches in close proximity to each other near the mouth of the little river Blythe, and unapproached as a group even in East Anglia in their original magnificence of plan, proportion, design, spaciousness, and scheme of decoration—a scheme in no one case fully executed. This church of Blythburgh is of one span throughout; it was built when the district was a prosperous manufacturing centre, and is now many sizes too large for the village population. The feeling of satisfaction with the effect of the grand planning is almost counterpoised by the regret awakened by its deplorable condition of ill-repair. The long range of aisle and clerestory windows is broken here and there on the north front by bricked-up lights; the whole head of the grand east window is a mass of plastered brickwork; the great low-pitched roof is not water-tight in places; many of the grotesque figures of men and beasts have disappeared from the heads of buttresses; the upper part of the tower is unworthy of its huge base, and is finished above a handsome flint-panelled course with a mean parapet, but has mouldering angle-statues, an instance of how 15th century architects had to cut down designs to suit their clients' purses. Along the south aisle wall runs a pierced parapet consisting of shallow-moulded free quatrefoils, in crocketed circles, rich and free as a lace fringe: but the return on the east side of the great south porch is broken off abruptly. The south porch itself was once groined, but the vault has fallen, revealing undersides of rafters in the middle of shattered ribs and liernes. The north side is much inferior to the south, and more defaced. On the west front is a rich panelling below a great Perpendicular window; on the east front is a range of 13 Old English letters and monograms, executed, as at Long Melford, in freestone on a flint ground, which defied all attempts at combination. At the angles of this front, as at St. Peter Mancroft, Norwich, are set octagonal turrets rising above the flat-pitched gable, on the centre of which again is a statue. We enter the church by the priest's south door, curiously enough placed in the line of a buttress, which has been converted into an *arc boutant* to allow of access east or west. The interior seems, paradoxically speaking, squalidly magnificent. Walls, arcades, piers, parvise screens, and all other accessible vertical surfaces are covered with whitewash, now not too clean, and defiled with rain-streaks. The nave floor is of brick, uneven and imperfect; here and there are matrices of brasses. Below the partially darkened east window are gaudy illuminated texts, while at the upper end of the church the tower arch is shut off for a lumber-store by woodwork capped with what was part of the screen. The chancel portion of roof has been strengthened with deal, left unpainted to show the distinction between this and the old work; the nave seating is made good on the south side with rickety pews of the same material. The arcades are shallowly worked into four centred heads, and rest on clustered shafts. The division of the six nave bays from the three in chancel is marked only by a somewhat broader pier than the others. The font is greatly mutilated, and stands on a platform of two stages. In the tower arch is a small painted wooden figure, once used as a "Jack-o'-th'-Clock," to chop on the bell with his battle-axe. We noted, however, that the 11 windows blown out by the great storm at the close of 1877 have been reglazed, and that there are many fragments in the smaller lights throughout the church of stained glass of the best 15th century character, preserved and guaranteed as genuine by the very non-restoration of the fabric. The woodwork of fittings, pulpit, lectern, poor-box, stalls, transposed screen, and the remaining and singularly varied bench ends are deserving of sketching and study, as well-wrought specimens of Early Tudor carving.

These points are observed as we wait for Dr. Raven to read from the fine pulpit a *résumé* of a paper written by him many years since. Commencing with the history of Blythburgh, the lecturer mentioned the evidence of Roman occupation afforded by the urns and other remains dug up in 1678, and the presumptive indication of early importance suggested by the fact that three ancient roadways cross at this point—the trackless river Blythe, and the Roman roads from Aldeburgh to Beccles, from Dunwich to Bungay and Caistor by Norwich, which latter can be traced by the ocurrence of cross-roads still called "streets." In the middle of the 7th century "Blytheborow" was the scene of the battle between the Pagan invader Penda, King of the Mercians, and the patron of the Burgundian Saint Felix, Anna, King of the East Angles. Anna and his son, Firminius, fell in battle, the latter's corpse being taken to St. Edmundsbury, that of the former being buried in Blythburgh Church. The next landmark was the founding of the Priory about 1130, most probably by the Abbot of St. Osyth's, Essex, to whom the church was granted by Henry I. The foundation was Augustinian—"black canons." The buildings of the Priory to the south-east of and near the church partly remain, and are of the period named as the foundation. Sir Richard Gipps in his *Suffolk Collections* speaks of a register of the Priory in Gresham College Library, but Dr. Raven said he had been unable to find this. The original charter was given by Richard I., and was rehearsed at length in a confirmation granted by Henry VI. To complete the history of the Priory, he would add that in 1528 Wolsey obtained a grant of it with those of Felixstowe, Romboro', Bromehill (or Brandonferry), and Montjoye by bull of Pope Clement VII. for the purpose of founding his church at Ipswich. The cardinal's fall arrested that of this priory, and afforded the last prior (John Righton) an opportunity of obtaining ready cash by granting a 99 years lease of Mendham and Blihurgh benefices with Walberswick Chapelry to Mr. Robert Preston. Five years after this transaction Righton and his small convent resigned the priory into the King's hands, and it was granted to Sir Arthur Hopton. Concerning the church in which they were assembled, the earliest recorded bequest for its erection was that of John Geyse, who, in 1442, left 20 marks towards rebuilding the chancel. There were none after 1473, but the workmen had not left the place at the death of Henry VII., if style might be regarded as basis of judgment. The plan consisted of chancel, nave, aisles with chapels, south porch, and west tower. In the chancel might be discerned a blocked-up piscina, and a tomb under a Purbeck marble canopy, bearing indents of three figures in scrolls, alleged, on the authority of an MS., formerly in the late Sir Ralph Bloise's possession, to be to the memory of Sir John Hopton, the founder of the chantry, at the east end of north aisle. The roof, although of a Late and depressed character, and without break between nave and chancel, was, the lecturer considered, a fine instance of ornament judiciously applied. Though the eye had to traverse the great length of 127ft., yet through the enrichment of the timber with angels, sacred monograms, bosses, and armorial bearings, there was no sense of weariness, and before delay and destruction commenced, the effect must have been very fine. The intersections of the three longitudinal ribs of the roof, with the nine transverse principals, afforded places for 54 shields of arms, and six more seem to have been added at the terminations of the longitudinal ribs in east wall and tower; not half of those now remaining, many can be identified with the county families they represent, and of those missing, many are registered in Davy's MSS. in the British Museum. All the intersections at the ridge rib are occupied by fine flower bosses, each supporting two angels bearing the shields. Some of the same coats can be identified in the fragments of stained glass, and others are carved on the exterior of the church. In the aisle roof the spandrel spaces were all occupied by carving, at once delicate and bold in a style worthy of buildings of the period of the best Geometrical Decorated. That the work is, however, of the Perpendicular period is plainly shown by the most western spandrel in the north aisle. In the south aisle several corbels remain in the physiognomy of which the individuality is so strong as to lead us to suppose that they are portraits. Amongst the remains of stained glass might be noted in the Hopton chantry a bishop, with crozier and book, and portions of the names of SS. Paul and Stephen, and the 1st and 3rd bishops of Dunwich—Felix and Boniface. In the south aisle, counting from the east end, are, in the second window, the well-known Trinity shield, and above it a figure with cross in hand and shield. In the fourth window a king with Saxon crown bearing a cross tau, and St. Etheldreda, foundress of Ely, and daughter of King Anna, killed and buried on this site. In the fifth window is the Virgin Mary in a mantle of rich crimson diapered, and a bodice with a diaper containing the letter Œ, and the name of St. Matthew, and an angel with six wings. The woodwork now in the chancel has been recently removed from the then Hopton chantry, which is screened off from the church as well as the south aisle chapel. This screen, now whitewashed, once extended across the church. It is a matter for congratulation that the lower part of the screen (which now forms the front of N. and S. stalls) with its fine series of carved figures, having flowing locks carefully arranged and beards of various cut, escaped the fury of the iconoclast Francis Jessope, who visited the church in 1644. Beginning from the east, the lecturer exhibited and identified the 16 figures as follows:—St. Luke, with doctrinal cap and book; St. Andrew, with beard in six peaks; St. Philip, with two loaves; St. Bartholomew, with flaying knife; St. Matthias, with axe and book; St. Anthony of Padua, with cross tau; St. John Baptist, with leathern girdle; and St. Stephen, with napkin. On the south side St. Thomas, with (broken) staff; St Matthew, with purse; St. James the Less, with fuller's club; St. Jude, with boat; St. James the Elder, with staff and book; St. Paul, with sword and book; St. Peter, with crossed keys; and St. John the Evangelist, with lamb. There are also on the north side, two other figures—an ecclesiastic giving the benediction, and Queen Etheldreda in 15th century dress. Jessope wrote of Blythburgh—"Twenty superstitious pictures are on the outside of the church, two crosses are on the porch, and another on the steeple, and 20 cherubims to be broken down in the church and chancel; and I brake down three *orate pro animabus*, and gave order to take down two more pictures within eight days." The exterior of the south aisle and porch presented to this day an instance of the individuality which an architect of genius could infuse into the Perpendicular style, even at a late period of its existence. The pinnacles of the aisle are surmounted with figures of animals, while the angles of the porch bear two well-executed angels. The gargoyle spouts are bold, one of them, especially, being of surpassing hideousness. Dr. Raven concluded an interesting paper by deploring as a sore scandal the decay of this great church, situate in a place of historic note, and surrounded by fair estates. The members then inspected the scanty remains of Blythburgh Priory, consisting of a few ivied ruins of arcades and fragments built into cottages, close by the churchyard wall.

SOUTHWOLD.

The grand Perpendicular church (St. Edmund) was the sole attraction in this little watering-place, hitherto secluded by being located at the end of a by-road, with but one approach by bridge over the creek, but about to be rendered more accessible by the opening of a light-line narrow-guage railway, now in course of completion. The church is one of the finest and purest examples of the usual type of Late Perpendicular church of East Anglia. It is entirely of one style, having been rebuilt during the reign of Henry VII., on the site of a chapel-of-ease to Reydon, erected in 1202 by the abbots of Bury St. Edmund's, and destroyed by fire. The external appearance is noble, there being a long range of 18 equal clerestoried and aisled bays, under continuous roofs; the great length is broken by a leaden flèche, marking the division of chancel and nave. At the west end is a tower 100ft. high, and on the south side a large porch, with parvise above. The tracery in the aisles and clerestory (the latter two-light), except at the eastern extensions of aisles, is uniform, and, together with the line of battlemented parapets, contributes greatly to the impressiveness of the general appearance. There is a large display of flint panelled work throughout the building, especially on the west front and the south front. The tower, as is so commonly the case in the Eastern Counties, has never been finished; the parapet is plain and cuts into the panelling, while in the centre of each belfry window is carried up a peculiar shaft and capital, passing above the head to the coping of tower. It is evident that the intention was to cap each buttress with a large pinnacle, and to add subsidiary ones in the centre of each face. On the west front is an instance of lettering in freestone and flint; it has the inscription, "Sancta Edmundus ora pro nobis." The interior is very fine and well-proportioned. The arcades are supported by clustered shafts; the central roof is, however, beamed with angels on principals. That portion over the chancel being decayed, had to be renewed throughout; the present roof has been decorated in colour under Mr. Phipson's superintendence, in reproduction of the traces found upon it, but at present the tones are too vivid to be harmonious with the fabric. The chief feature of the church is the magnificent screen, which is still in position and perfect, with the exception of the beam. It is very handsomely carved in open work, painted, and gilt, and is decorated with delicate raised panelling executed in mastic. The heads of the saints upon it have been repainted by Mr. Richmond, R.A. For the elaborate nature and extent of the ornamentation, and the wonderful wax-like forms and miniature figures, the screen has scarcely an equal. The side screens to the aisles are also very elaborate. The font is Late Decorated, and on its panel are represented the Seven Sacraments. Dowsing, the Iconoclast, when he visited the church in 1644, played great havoc with it. In the church Mr. R. M. Phipson read a paper, some portions of which we may reproduce in a future issue. Mr. Brock expressed the gratification felt at the conservative spirit with which the church has been restored, and contrasted its condition with the decay, decrepitude, and disorder into which the almost equally grand building visited just previously has fallen. Dr. Raven remarked on the improper position (facing westwards) of the beautiful stalls with miserere seats, and on their jumbled condition; to which Mr. Phipson replied that the woodwork in the chancel was rearranged before he was consulted. In answer to a question as to how the slight relief ornamentation on the woodwork of the screen was raised, Mr. Phipson said the material was mastic, and that plaster moulds appeared to have been made, in which it was recast in sections (which could easily be detected at the junctions), and applied to the mouldings with shellac.

Dr. Raven called attention to the very fine specimen of a "Jack o' th' Clock," a painted wooden mannikin attired in complete armour of the early Jacobean period. This figure used to stand in the tower and strike the bell of the clock, with which he is coeval; but when the tower arch was closed, Jack was removed to his present position, in the first north bay of chancel. His duty nowadays is to give notice when the preacher is ready for the organist to commence, of which striking evidence was at once afforded by "Jack," who was impelled by a string in the vestry. Shakespeare makes Richard II. complain—

> 'My time
> Runs posting on in Bolingbroke's proud joy
> While I stand fooling here, his Jack o' th' Clock.'

The name of these now rare puppets has been transferred from the celebrated ones on the great clock at Dijon, which were called "Jacquemarts." One derivation of that word is from the Low Latin, "jaccomarchiadus," a coat of mail; but a more probable one is from the clockmakers, Jacques Marck, grandfather and descendant, who were living in Dijon in 1360 and 1422.

THORINGTON CHURCH

Was the last place visited. It was restored only too effectually about twenty years ago, under the direction of Mr. Blackburn. The nave is Late Norman, the most interesting feature being the round tower; this is of rubble work, and has a course of shallow blank arcading some 2in. deep, worked in the rubble without dressings, and on the belfry stage Norman two-light windows, each with a thick central cushion-capped shaft, supporting a blind tympanum. Above this is a well-worked octagonal parapet of red brick, with terra-cotta panels; this Mr. Phipson considered a Jacobean addition, while Mr. Brock pronounced it as Late Perpendicular, and the rector, the Rev. T Hill, regarded the work as that referred to in Inchwarden's accounts of 1780. The nave roof is a specimen of Perpendicular open roof of oak, with angels supporting the principals. There is a fragment of a Norman window blocked by the south porch. The tower arch is filled by an elaborate pseudo-Norman arch, with exaggerated chevron and lozenge mouldings, and an inner member like nothing ever designed prior to the 19th century, unless it were an early specimen of perforated frilling to a confectioner's cake. As frontispiece to this, obscuring the view of the Early English arcaded marble font-bowl in the circular baptistry, is an iron stove—an ironmonger's stock pattern, and therefore vulgar. In the church some discussion arose, the rector having claimed that in the restoration much money had been expended by the great family in the parish (the Bences); they had increased the accommodation by cutting away the lower part of the thick early walls (considered by Mr. Brock as Norman, but by Mr. Phipson as Late 13th century work, in which the earlier windows were reworked), and had beautified the building. Mr. Brock expressed the general regret that the church had been so over-restored, and that money which had doubtless been expended to render God's service more orderly and useful, had not been judiciously spent. He especially protested against the cutting away of the walls, and the addition of a modern-antique tower arch, which, although it might be a pretty specimen of revived Norman, was, on the rector's admission, very different to the genuine arch over the tower entrance. Mr. Phipson, after a preliminary spar with Mr. Brock as to the date of the walls, expressed his concurrence in the censure of this restoration. He remembered the former church, with small plain, but very good, Norman tower arch, its simple west window, and the beautiful east end, and was sorry to note the changes in the appearance of the building. After some further remarks of similar severe character, the party adjourned to the rectory lawn, where tea, coffee, and other mollifying refreshments were offered by the rector (who explained that he came into the parish long subsequent to the restoration spoken of, and added that he knew nothing about architecture), assisted by some ladies. In returning thanks to the clergyman, who had thus heaped coals of fire on the visitors' heads, a further amusing blunder was made in expressing gratitude for the trouble taken by Mrs. Hill, of whose existence the rector avowed entire ignorance.

(*Continued on page* 229.)

AN INCREDIBLE STORY.*

SUCH is the title of a cleverly-written letter addressed by Mr. T. J. Nelson, chairman of the Lower Thames Valley Main Sewerage Board, to the Earl of Beaconsfield, in which the writer recounts some startling facts of misgovernment, or rather legislative bungling. The story told by Mr. Nelson is a lesson to all sanitary boards, and is one that nearly all the places along the Thames Valley have realised to their cost. They have all, in obedience to the "powers that be" had first to carry their sewerage into the Thames, and then to discontinue to pollute the river under the pain of penalties. Next they have, at great cost to the ratepayers, had to make expensive inquiries and applications to the Local Government Board for permission to adopt some scheme of irrigation, filtration or chemical treatment, but have in nearly all cases met with refusal, and lastly, when they have united to secure strength, and have obtained authority, have been beaten by opposition, and their members threatened by legal proceedings for the expenses incurred.

Thus the local boards have been driven from pillar to post, and are now incurring severe penalties for not obeying a law that they cannot practically carry out. One district after another of the Lower Thames Valley has, Mr. Nelson justly says, "produced schemes for obeying the law which have been impartially stifled by the Local Government Board when their authority for carrying them out was asked for. It mattered nothing what the unfortunate district proposed, whether irrigation, downward filtration, precipitation, or chemical treatment, nor whether the place of treatment was in the district or out of the district, opponents always appeared, and they always succeeded in preventing the local authority carrying out its plans." To such straits the Lower Thames Valley Board have come. Kingston, Richmond, Kew, Barnes, Mortlake, Esher, Heston, and Isleworth, have all been similarly treated for complying with the law. In every case, after inquiries and wasted expenditure to the ratepayers, there has been failure. Wimbledon wanted an outlet for its sewage, and Sir Joseph Bazalgette proposed a scheme of union of all places in the Thames Valley, by which the sewage was to be taken to Bagshot Heath, which fell to the ground; afterwards Surbiton plucked up courage and asked the Local Government Board for a comprehensive scheme including all places between Windsor and London, and that the sewage should be taken to an outfall near to the sea. Colonel Ponsonby Cox, R.E., held an inquiry, overwhelming evidence was elicited, showing that all other modes of disposal than that of the river Thames had failed, and he thereupon reported that a combination of less magnitude should be made, namely, of places between Hampton and London. This also fell to the ground from the opposition of the Minister of Health to a joint Sewage Board. Hampton Wick and other places were again summoned by the Thames Conservators for penalties, and in the former case they amounted to £98,000, while the rateable value of Hampton Wick is about £11,000 a year. In this dilemma the local board applied to the Local Government Board to form a joint board on Colonel Cox's basis. Thus it came about that Hampton Wick was at last rewarded by persistently fighting, and the places between Hampton and London were included, except Brentford and Twickenham, which are still left to discharge into the Thames, the first being an omission by the Local Government Board, and the latter by permission of the House of Lords. The penalties of the local boards were relieved, and three years was given to the joint board to do the work. A scheme proposed by Colonel Haywood, the City engineer, was next resolved upon, but another obstacle then presented itself, namely, the authority required to purchase land and water rights. The Local Government Board could confer no power for the latter rights, which were essential to the scheme, Parliament was applied to, the Bill was petitioned against as lost on a division.

This in brief is Mr. Nelson's story, incredible as it may appear; the best engineers and authorities were consulted, irrigation on land was recommended, but with the above unfortunate repulse. The Chairman, as a last resort, addresses himself to the "Head of Her Majesty's Government," one who once promulgated the doctrine *sanitas sanitatum omnia sanitas;* but we may inquire to what purpose, while the opponents of the Joint Board are seeking to make its members personally liable for the expenses of the failure. Surely if there is a "head" over the present Government at all, the members of the Joint Board ought to be indemnified by Parliament. But well may the author ask "Is it a rational state of things to be told to take our sewage out of the Thames and personally pay the costs of failure to obtain the necessary legal powers?" Here are men honestly acting with a simple desire to discharge a sanitary duty subject to pecuniary penalties! We can scarcely believe it.

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* An Incredible Story, told in a Letter to the Right Hon. the Earl of Beaconsfield, Prime Minister. London: Jas. Truscott and Son.

LEGAL INTELLIGENCE.

An Architect sued by his Stone Carver.—On the 14th inst., at the Sheffield County-Court, Mr. Frederick Turner, architectural carver, sued Mr. E. M. Gibbs, architect, for £24 10s. for work done. —Mr. Clegg for the plaintiff, and Mr. H. Thomas for the defendant. The plaintiff was employed by the defendant to execute a quantity of architectural carving in front of the shop premises in the course of erection in Fargate, belonging to Mr. Widdison, the amount of his contract being £62 10s. Of this sum £38 had been paid to the plaintiff as the work progressed, and after the action was brought £4 were paid into court.—The defence was that the plaintiff had done the work in an improper and unskilful manner, and had not turned out what he was understood to execute, viz., first-class architectural carving. The defendant stated that he had complained to the plaintiff several times of the unworkmanlike character of the carving, and, finding that he did not improve, he discharged him. The plaintiff's claim included a charge for models made for carving, and the answer to this was that when an architectural carver entered into a contract to execute carving the models were included in the contract unless they were specially ordered.—The judge disallowed the charge of £6 for models, and gave a verdict for the plaintiff for £18 10s. with costs.

CHIPS.

The parish church of Sutton Brailes was reopened a fortnight since by the Bishop of Gloucester, after restoration under Mr. Smith, of London. The floor has been laid with encaustic tiles, the nave has new open seats of pitch pine; the new pulpit, prayer-desks, and seats for choir are of oak, and the Communion-rails and lectern are of burnished brass. An organ has been placed in the church, built by Hewins, of Stratford.

On Wednesday week the new chancel of the parish church, Brinkworth, was consecrated. Mr. Middleton, of Cheltenham, was the architect, and the work has been carried out by Mr. William Jones, of Gloucester.

A new museum of art was opened on the 9th inst. at Berne. The recently deceased Duchess de Colonna who, under the assumed name of Marcello, acquired considerable reputation as a sculptor, has by will left all her own works, as well as a large collection of objects of art, to her native canton of Freiburg, on condition that they be kept in a special department of the Freiburg Museum. This to be called the Musée Colonna, and for its maintenance the deceased lady has left a sum of 50,000 francs.

New public baths at Widnes were opened on Tuesday week. The style of the building is Renaissance, and the cost about £3,000. The architects are Messrs. Horton and Bridgford, of Manchester, who superintended the erection of the Southport Baths; and the heating apparatus has been supplied, and the engineering arrangements carried out, by Messrs. Thomas Bradford and Co., of Manchester. Mr. S. Hogg, of Widnes, has acted as clerk of the works, the sole contractors for which were Messrs. J. W. Carlile and Co.

The next few days will afford tourists and others the last chance of seeing Haworth old church in its integrity. The alterations which are to give to its interior an entirely new character will be commenced in a fortnight's time.

On Wednesday week a new Wesleyan chapel was opened at Haxby. Mr. E. Taylor. of Stonegate, York, is the architect. The chapel is Byzantine in style. It is faced with the yellow Scarborough brick, with stone dressings and overhanging roofs.

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ILLUSTRATIONS.

SIDE ELEVATION AND PRINCIPAL PLANS OF THE NEW CITY OF LONDON SCHOOL.—ENTRANCE LODGE AT MENTMORE.—THE PEEL HOUSE OF NEWBYRES, NEAR GOREBRIDGE, N.B.—NEW POST OFFICE, OXFORD.—ST. MICHAEL'S CHURCH, DITTON HALL, LANCASHIRE.

OUR LITHOGRAPHIC ILLUSTRATIONS.

CITY OF LONDON SCHOOL.

We give this week the side elevation and principal plans of the premiated design for the above building which is now being carried out by its authors, Messrs. Davis and Emmanuel, of Finsbury-circus, and of which last week we gave the principal elevation.

NEW ENTRANCE LODGE, MENTMORE.

This lodge was designed at the request of Miss Hannah de Rothschild (Lady Rosebery) to be erected at the new entrance gateway to the park, from the direction of Leighton Buzzard. The general style of the mansion (of which the design was adapted from that of Wollaton, Nottingham), was followed, without any close adherence in detail. The lodge was purposely kept small and unpretending; to be erected in Ancaster stone, of which the house itself is built; Mr. W. Niven, architect.

NEWBYRES PEELHOUSE.

The remains of this tower stand in a field adjoining the Gorebridge Railway Station, near Edinburgh. The accompanying drawings show a restoration to what in all probability it originally was, judging by the existing fragments; it is built of the stone of the district, and as will be seen from the plans, is in the form of an oblong tower, with a portion projecting outwards which held the circular stair. The floors have all disappeared as well as the masonry above the corbel course, supporting the 'parapet at eaves of roof. This building is similar in many respects to the peelhouses scattered all over Scotland, and more particularly towards the south, and upon the border; all present the same characteristics as to plan and general arrangement in the interior. The whole space inside, as in the example before us, was taken up on each floor by one apartment; the ground-floor level with, but often some steps down from, the ground outside was used for stabling, or the housing of cattle, and often only communicated with the rooms over, by a trap in the floor above. This lower floor was always vaulted with masonry, and lighted by slits, and holes for shooting out of were placed commanding the principal entrance, in form outside like a human eye. The first-floor was the living-room where cooking took place, meals were eaten, and was used in general as the hall or common room of the family. The second-floor and the top story opening out into the parapets were used for sleeping purposes. A very common feature observed in the interior of the walls is a row of corbels, placed about half-way up from the floor, but whether to serve for the support of an intermediate floor, or only as a rest for a light partial flooring sufficiently strong to carry stores, onions, dried herbs, lumber, &c., has not been satisfactorily decided. Recesses in the thickness of the walls frequently occur, and as these are often large enough to hold a bed, it may be surmised that the women of the house found here privacy for the night. Many other characteristics might be mentioned all bearing some meaning, and for some use, and in conformity with the Scottish characteristics of economy and wariness; in the angles of the building are placed look-out closets with holes for observation just large enough for the muzzle of a gun, or to shoot an arrow, machicolated corbel courses supporting the parapets through the openings of which were discharged hot water, molten lead, and other disagreeable matter on the head of the unwary enemy. The exterior presented the usual features of Scottish architecture, the corbic steps very similar to those in Normandy, and borrowed, doubtless, from France, along with turrets and other French details, when Scotland was so intimately associated with the French nation. Parapets run round the entire building, ornamented with open crenellations and circular bartizans at the corners, with gurgoyles or water spouts at frequent intervals to carry off the rain water; the roof were either of vaulted stone, or constructed of wooden rafters, covered with heavy slabs of freestone an inch or two thick, often laid diamondwise; carving and ornament is rarely found except, perhaps, at the hall fireplace, where is sometimes seen—as at the neighbouring castles of Borthwick, or Crichton, and notably at Cornlungan Castle, in Dumfriesshire—fairly designed but rudely executed attempts at 14th Century Gothic work, crockets, and canopies, and finials, intermingled with shields bearing the coat-mail of the owner and his wife, with initials, monograms, dates, and sometimes quaint lettering in the form of a quip, a prayer, or a text from Scripture. In many cases each floor was barrel-vaulted, the vaults running alternate ways as they rise, as at Preston Tower, near Prestonpans. The dungeon was an important place in a Scottish gentleman's house in the Middle Ages, and was named the massymore; it is often mentioned by Sir Walter Scott, a very good specimen being found at the neighbouring Crichton Castle, where it is placed in the landing of the staircase, and is just large enough to hold a man, access being gained by a trap door in the roof, closed by a massive stone with an iron ring attached, no light and very little air being admitted to the luckless prisoner. Newbyres tower seems to have belonged to a branch of the Borthwicks, as their coat mail is seen on a small shield on the staircase projection; beyond this nothing of historical interest attaches itself to the building.

OXFORD POST OFFICE.

The design we publish emanates from Her Majesty's Office of Works, the architect being Mr. E. G. Rivers, surveyor to the board, under whose superintendence the work is now being carried out. The builders are Messrs. J. R. Symm and Co., of Oxford, and the clerk of the works is Mr. Henry Luff. On the ground floor, to the front, is the public office, a spacious apartment, 14ft. in height, and to the rear are the postmaster's room, sorting office, lavatories, &c., &c. The sorting office is 60′ 0″ long, 38′ 0 wide, and 15ft. high to the eaves, having an open roof, with iron trusses surmounted by a lantern. On the basement are the clerks' retiring room, kitchen, heating apparatus, and battery rooms. The first floor will be occupied by the telegraph department, the instrument room being directly over the public office. The second floor will be devoted to the use of the caretaker and store-rooms. The materials employed are, for the walling, white bricks of Weal manufacture, and Chilmark stone for the facework of the principal portion of the building. The columns to the front entrance are of Ross of Mull granite. The fittings of the public office, also the dado and doors will be of pitch pine. The public office and entrance lobby will have enriched ceilings in plaster. Ventilation is effected by means of flues in the walls, which admit air from the outside at about the floor level and discharge it into the rooms at a height of about 7ft. from the floor. Vitiated air is drawn off from the public office and rooms above by means of separate flues which communicate with a ventilating turret fixed in the roof space, in which three circular rows of gas burners will be fixed, thus affording ample means of extracting the foul air during damp cold weather. The public office, sorting office, and instrument room will be heated by means of hot water pipes and coils. The public office and postmaster's room will have a fireproof floor of Dennett's construction.

ST. MICHAEL'S ROMAN CATHOLIC CHURCH, NEAR WIDNES, LANCASHIRE.

This church, of which we give an illustration this week, is situated at Ditton Hall, near Widnes, Lancashire, and is built from the designs of Mr. Henry Clutton, 9, Spring-gardens (late of 9, New Burlington-street, W.,) at a cost of about £20,000. Externally, the edifice is faced with local red sandstone from the Rainhill quarries. The ashlaring is in straight courses, varying from 7 to 13½in. in height. It has a batted face, and the beds and joints are finely worked, set with a close joint, and afterwards raked out. The dressings are very carefully worked, and have a rubbed face. All the gutters and down pipes are of lead. The roof is covered with Bangor Countess slating. Internally, the stone used is Corsham. The shafts of the arcading at the east end and in the chancel are of Emperor's red marble. The ceilings of the aisles, and the roof of the nave, are covered with oak boarding in narrow widths. The two folding doors in the tower entrance are of teak, and are so constructed that they open inwards and outwards. The other doors are of oak. The fittings to the doors, the saddle bars to windows, and cross to tower, are executed in gun-metal. The floor, together with the steps, is paved with rubbed York stone, with the exception of that part under the seats, which has a boarded floor. The seats have been placed in the nave only, the aisles being utilised for altars. The whole of the above works have been executed by Mr. Albert Kimberley, of Banbury, Mr. Thomas Burton being the clerk of the works.

COMPETITIONS.

Blyth Mechanics' Institute.—The Mechanics' Institution committee last week finished their inspection of twenty-four plans, which were submitted for competition for the prize of £25, offered by them for the best plan and specification. The successful competitor proved to be Mr. James Hogg, architect, Pilgrim-street, Newcastle.

Over Darwen Town Hall Competition.—We are requested by Messrs. Tait and Laugham, of Leicester, to state that though amongst the architects invited to compete, they did not submit a design.

Gloucester Asylum Competition.—We have since ascertained that the design "Glory of Glevum," to which, as we stated last week, honourable mention was awarded conjointly with "Utilitas," was submitted by Mr. Wm. Dawes, of Manchester.

CHIPS.

The formal opening of the new buildings for Queen Elizabeth's Grammar School, Faversham, took place last week; the Very Reverend the Dean of Canterbury (the chairman of the governors) presiding at the luncheon. The buildings comprise day and boarding schools and master's residence, and have been erected in the Queen Anne style, at a cost of £5,700. Mr. Lewis Shrubsole, of Faversham, has been sole contractor, and Mr. T. Ware clerk of works. Mr. James Ledingham, of Bradford, has been the architect, from whose designs and under whose superintendence the works have been carried out.

It is proposed to make considerable additions to the Eggars Free Grammar School, Alton, consisting of new schoolroom and classroom with dormitories over. The present buildings were erected in 1641, and will be thoroughly remodelled. The whole to be executed from the designs and under the superintendence of Mr. Alfred H. Tiltman, A.R.I.B.A., of 22, Great James-street, Bedford-row, W.C. Anstey Manor House, near the above, is also being rebuilt from the designs of Mr. Tiltman.

New board schools, Bedminster-down. Bristol, have been opened. They consist of a mixed schoolroom and two classrooms, capable of accommodating 130 boys and girls, besides a separate department for 70 infants. The walls are built of 18in. brickwork, the roofs are covered in with Roman tiles, and the internal woodwork, including the roof timbers, is stained and varnished. Mr. John Crick, the contractor, has executed the whole from designs and under the superintendence of Mr. Alfred Harford, architect, of Broad-street, Bristol.

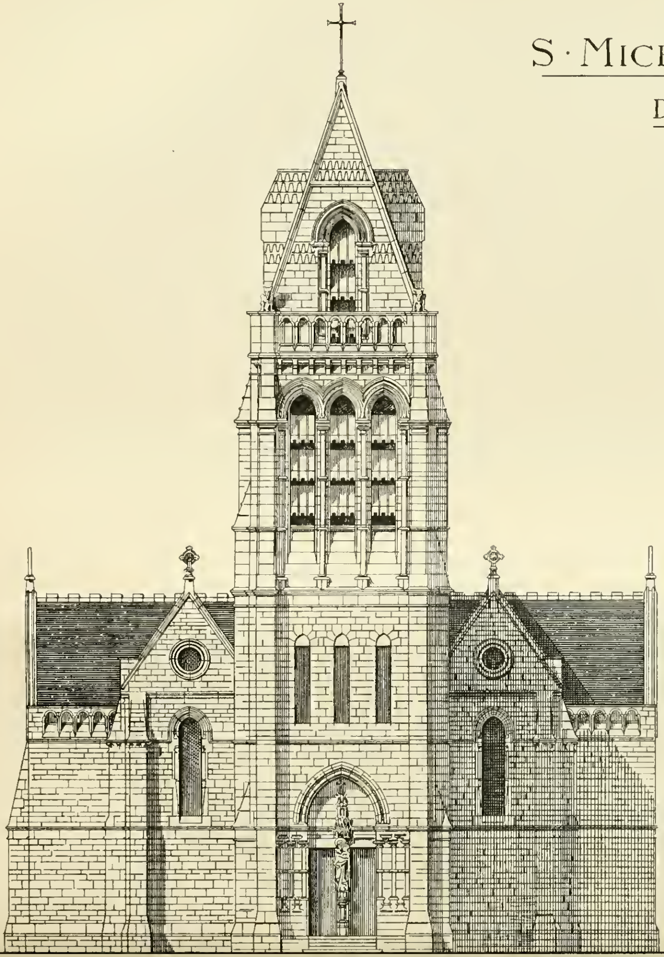
In consequence of the large development of their business, Messrs. Green and King have determined to rebuild their premises at 100, New Bond-street, and have accordingly, for the time, removed from here to Nos. 370 and 372, Edgware-road, where their principal factory is situated.

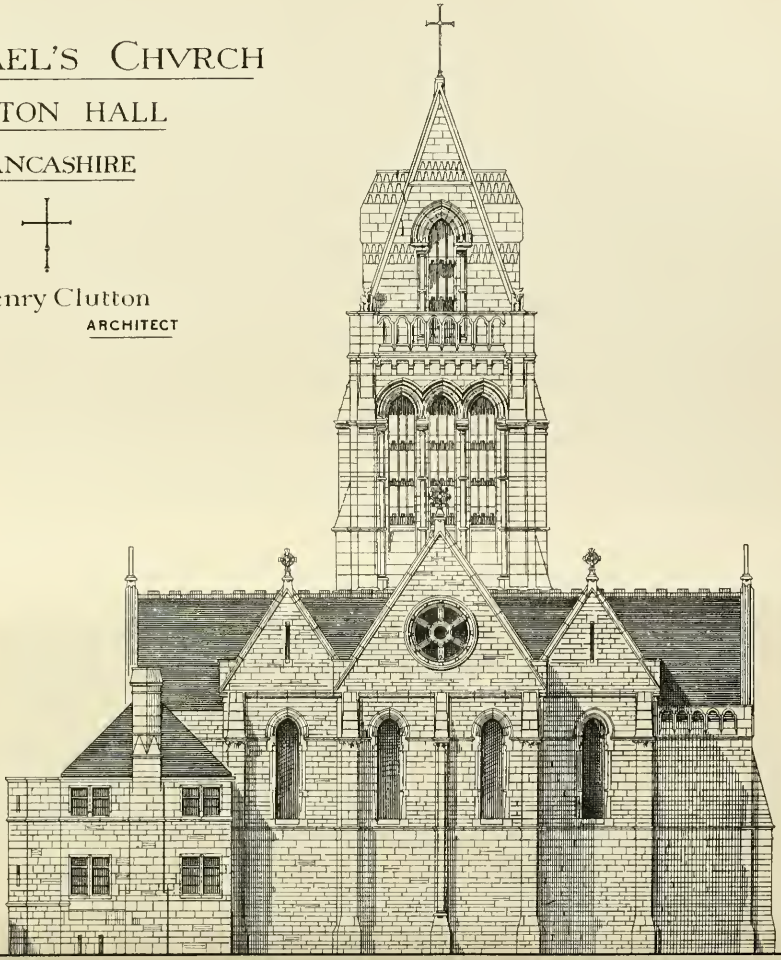
S·MICHAEL'S CHVRCH

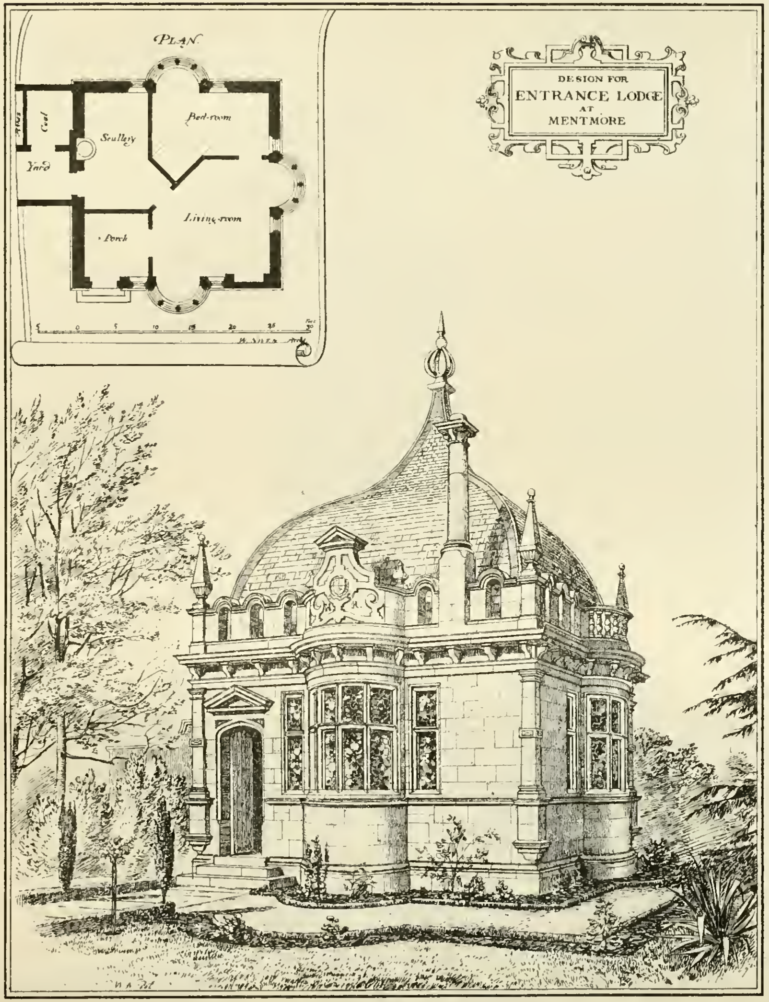
DITTON HALL

LANCASHIRE

Henry Clutton
ARCHITECT

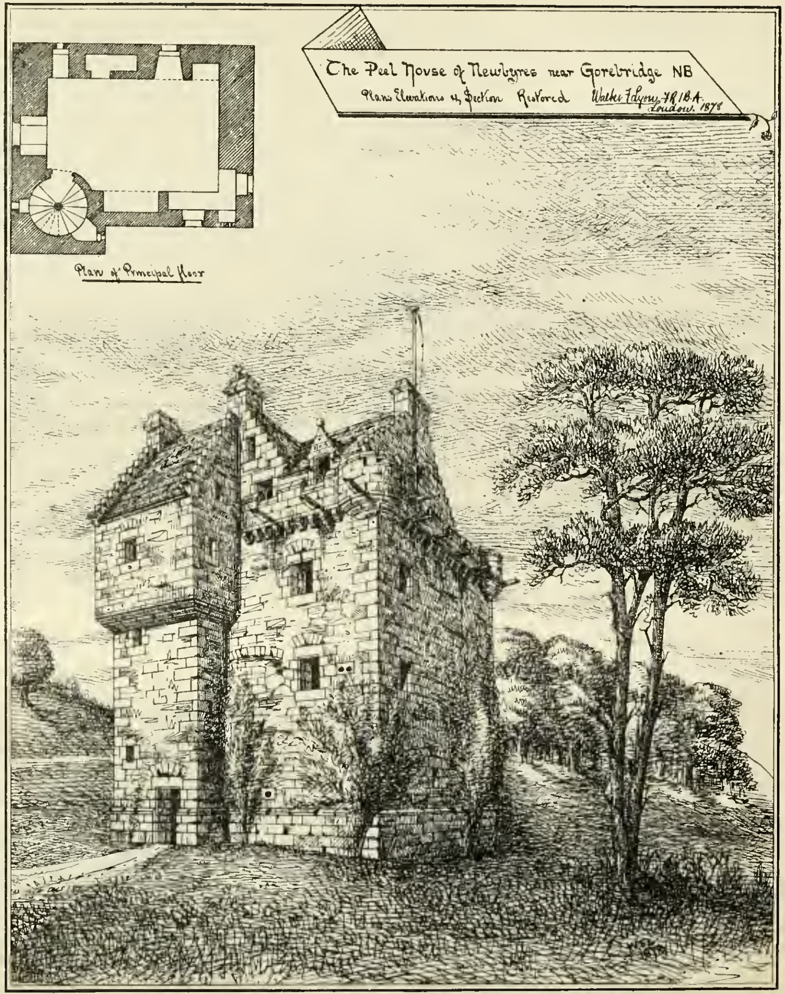






DESIGN FOR
ENTRANCE LODGE
AT
MENTMORE

W. Niven Arch^t



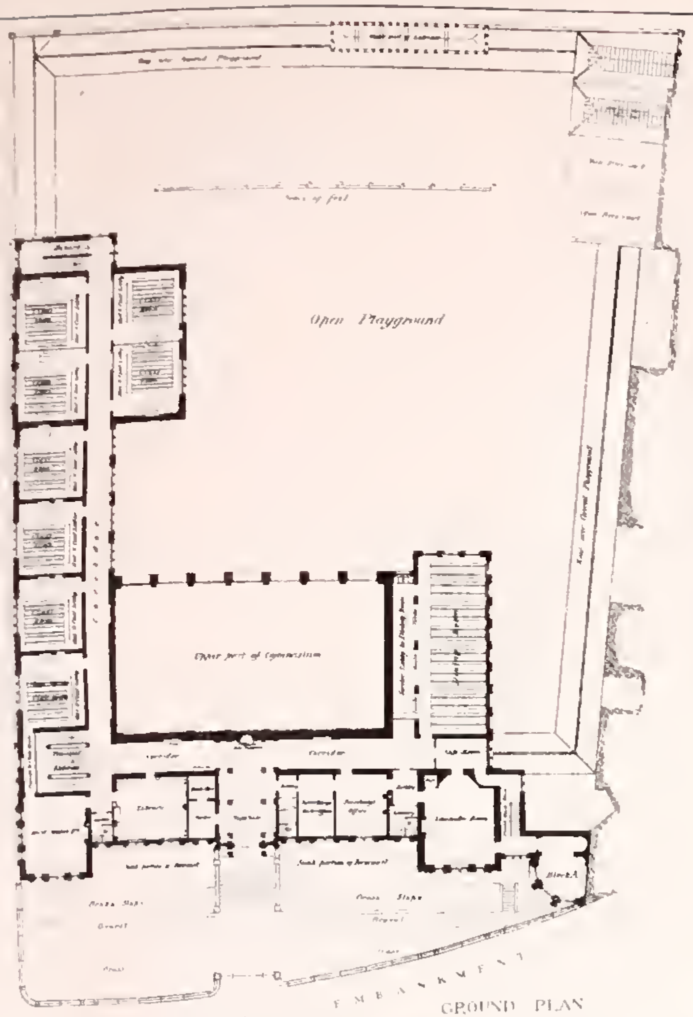
The Peel House of Newbyres near Gorebridge NB
Plans Elevations & Section Restored Walter F. Lyon F.R.I.B.A. London. 1878

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W C

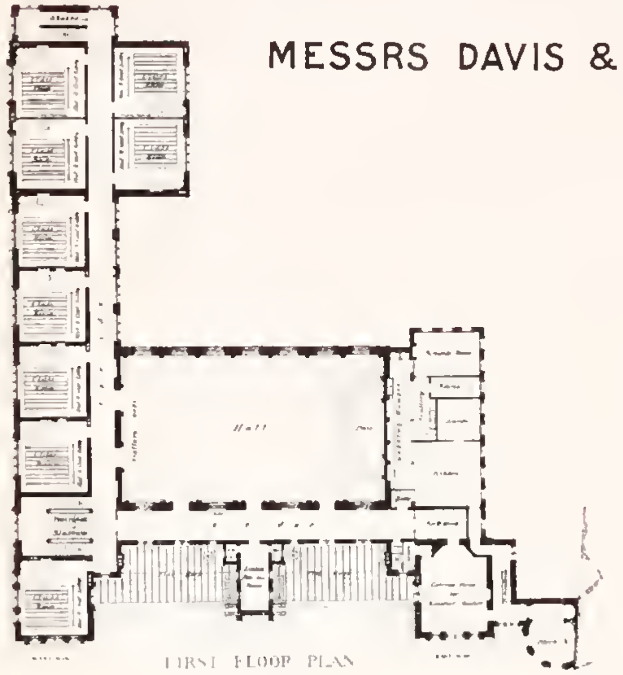
CITY OF LONDON SCHOOL.

SELECTED DESIGN

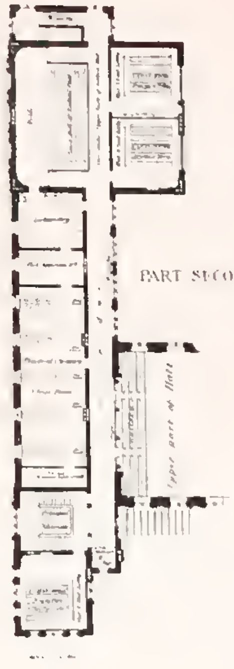
MESSRS DAVIS & EMANUEL
ARCHITECTS.



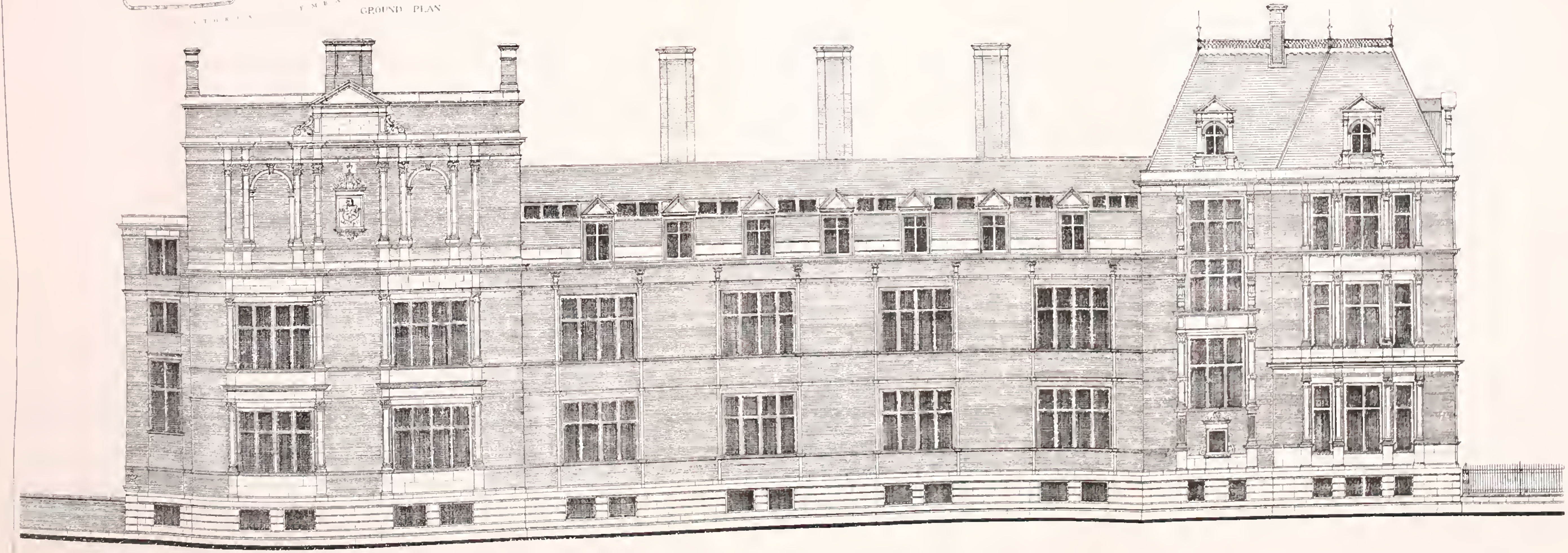
GROUND PLAN



FIRST FLOOR PLAN



PART SECOND FLOOR PLAN



SIDE ELEVATION NEXT INTENDED ROADWAY

Photo Lithographed & Printed by James Akerman 6, Queen Square, W.C.

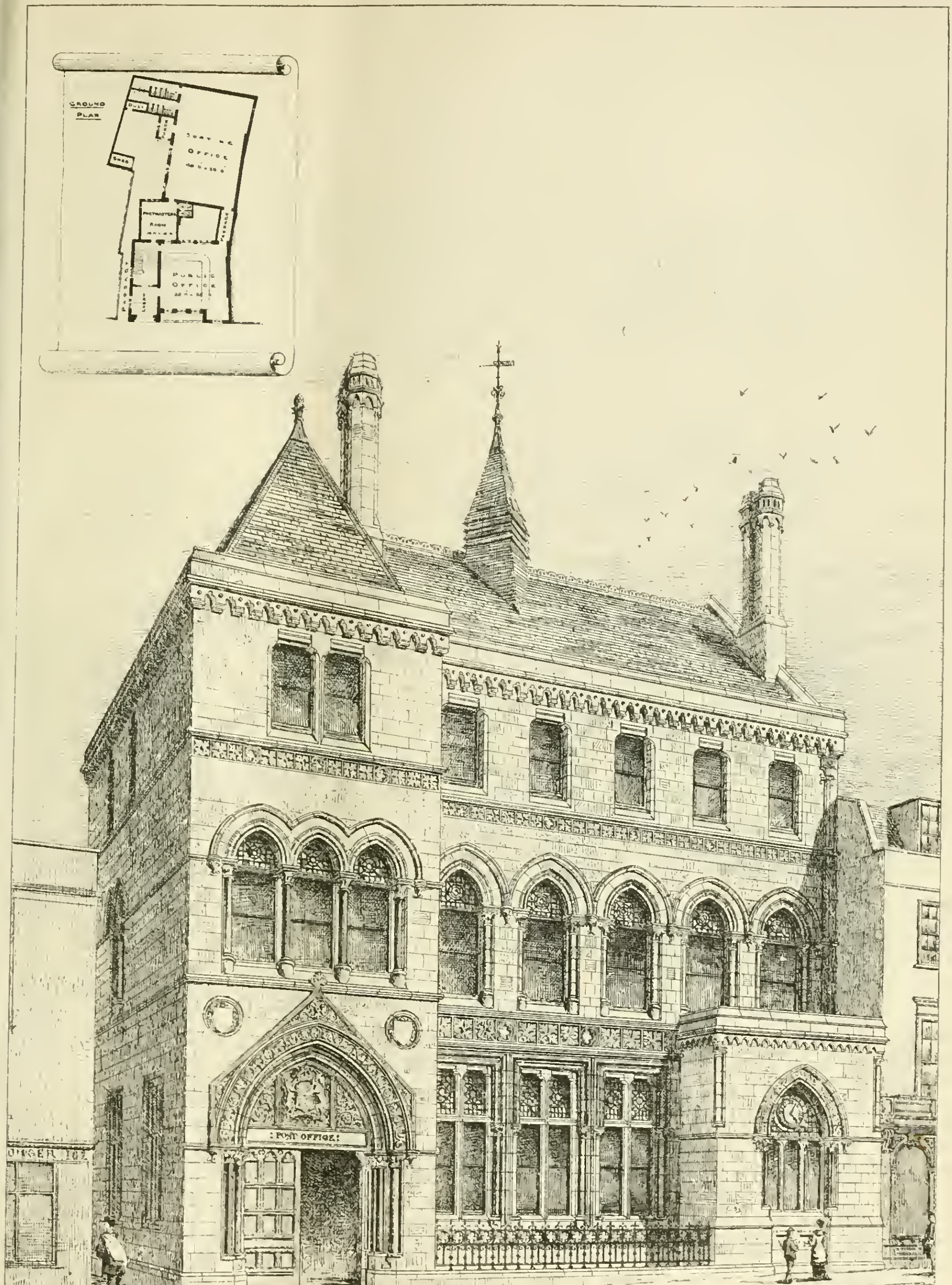
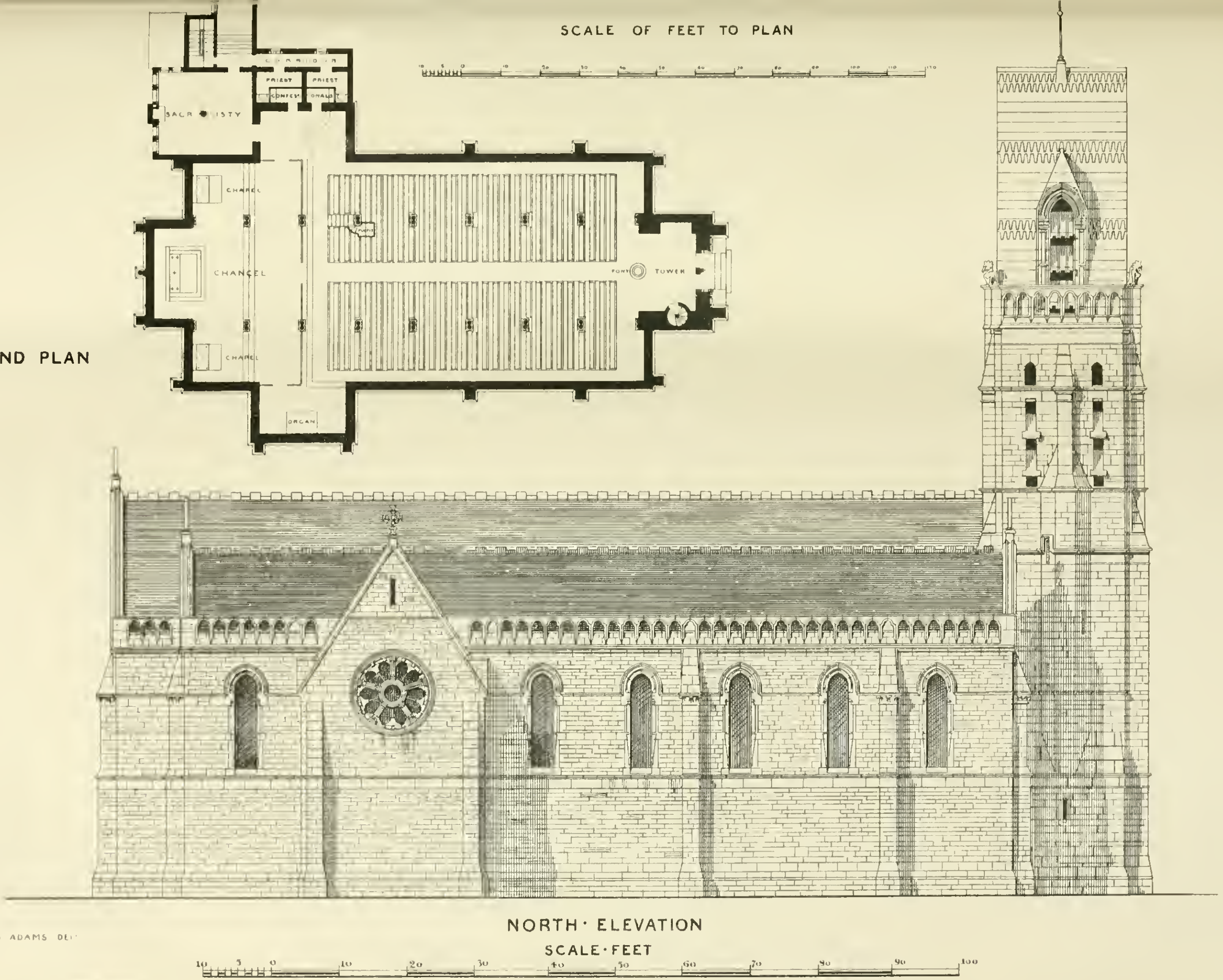


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

NEW : POST : OFFICE : OXFORD : E.G. RIVERS ARCHITECT

SCALE OF FEET TO PLAN

GROUND PLAN



NORTH · ELEVATION

SCALE · FEET

MAURICE B ADAMS DEL

Photo Lithographed & Printed by James Akerman 6, Queen Square W.C.

THE ARCHÆOLOGICAL CONGRESS AT YARMOUTH AND NORWICH.

(*Continued from page* 215.)

SATURDAY.

The morning was devoted to a second perambulation of the town, and the afternoon to a visit to Gorleston.

ST. NICHOLAS PARISH CHURCH,

originally a portion of the adjacent Benedictine priory, was the first place visited. The church has the dubious distinction of being wider (110ft. across nave and aisles) and covering a larger area than any other in the United Kingdom. Its great size and cruciform plan give the edifice a certain dignity, but the lowness of the lines of building as compared with their breadth, the debased character of most of the fenestration, and the scantiness and coarseness of ornamental details deprive it to a large extent, whether viewed within or without, of the charms of dignity and proportion. The central external feature is a modern wooden and lead spire, clumsy in its lines and somewhat out of the perpendicular. The best point of view is at the west front, which is of good Early English character, showing a narrow nave, flanked by a much wider aisle on either side, with well-moulded lancet lights in each; between and beyond the gables are octagonal turrets, with pinnacles, serving to break up the broad masses. Large as the edifice is, traces of proposed additions are evident adjoining the walls in many places. Beyond the west front are fragments of what was to have been a grand architectural conception of a new masking façade of central tower with shallow west turrets and transepts, and it has been proposed that a lofty tower and spire be erected on the old foundations. Again on the faces of the south transept, excavations have just been made revealing within elaborate panelled and arcaded screen front of Henry VII. time, three low openings, corresponding with rectangular buildings outside and adjoining the south chancel aisle. As to these some discussion occurred, Dr. Raven contending that they formed a Late chapter-house, Mr. Brock and others regarding it merely as the vestry, coeval with the Late Perpendicular panelling, though they have communicated with the church. Within, St. Nicholas has a depressed but very spacious appearance. The south aisle and nave have been inclosed within recent times under one waggon vault of immense span. In the south choir aisle are remains of Decorated sedilia and an aumbry. The choir is of three bays, but the whole east end is new, the original one having fallen in 1784. In the usual position are very elaborate sedilia. On the south side of the choir are five canopied stalls of well developed Early English character, of oak. The design is very graceful, and well executed. These stalls have been designed by Mr. J. P. Seddon, who has succeeded the late Sir Gilbert Scott, as architect for the church, were illustrated in the Building News a few years since, and are proposed to be carried out throughout the choir when funds permit. The north and south chancel aisles have the bare oaken rafters of a simple waggon vault without any attempt at decorative treatment, and when the needful structural repairs are executed these deserve early attention. There is a Jacobean font and cover, and amongst the monuments are sepulchral recesses, one to a prior, and a Perpendicular one for a Fastolfe of Caister. We have not space to dwell in detail on the many points of interest in this huge church, but may notice in passing a singular revolving reading desk now lying unused in the south transept. Within a massive stand is hung an immense wheel over six feet high. Six wide and well-balanced shelves are fitted on the principle of the floats on a water-wheel, so that by turning the wheel on a rack and pinion movement a fresh set of books, opened at the place of the next lesson or collect, can be brought within view of the preaching minister. The idea might be utilised in a library, where it would prove convenient in compiling from or comparing many volumes.

A paper was read in the nave by the Ven. Archdeacon Neville, of Norwich. No one who visits this church can fail to be struck, not only by the vast dimensions of the building, but also by its ingenuity of form and arrangement. Probably in no church in England are the aisles so disproportionate to the size of the nave, and in few churches is an equal opportunity afforded for studying the various styles from the Conquest to the Reformation. Herbert de Losinga, the first Bishop of Norwich, commenced the erection of this church in 1101, and it was completed in 1119. The original church, according to the author, was in the form of a Latin cross, with a central tower, a nave 101ft. by 24ft. wide, transepts, each of equal width with the nave, and chancel. All that building, except the central tower, had been swept away by successive alterations, and to this tower has been added a belfry-stage, erected about the middle of the 13th century, afterwards surmounted by a spire; the Norman piers were cased at a later period, and the arches considerably raised, but the core of Herbert's tower remains, and on its outer face, above the ceiling of the south transept, the old Norman arcading, with billet moulding above, may still be seen. (The same arcading has been reproduced on the three other sides.) When examined in 1862 the great wooden piles on which the tower stands were found to be undecayed, and strong as when first driven into the sand, nearly eight centuries ago. This tower has ever determined the form and character of the church; it has ruled the width of nave, chancel, and transepts, and, while expansions have been made in all directions, the tower has ever tended to depress the elevation of the church. During the reign of King John the church, now insufficient for the population, was rebuilt. The fact that no trace of Norman architecture is to be found in the nave columns indicates that the earlier nave had no aisles. The outer walls of nave were removed and a new nave of eight bays constructed; extending westward to its present length. At the same time two narrow lean-to aisles were built, each 13ft. wide. The stone stringcourse which received the timbers of these lean-to roofs and the corbels and eaves courses of the nave above may still be seen, as well as the solid ashlar work at the west end, with the quoins marking where the aisles terminated. The nave columns are alternately octagonal, circular, and clustered, and Sir Gilbert Scott considered that the character of the work exactly agreed with the tradition that this part of the church was carried out during the reign of King John. The nave was then terminated by a bold doorway, and above was a triplet of lancet windows, the gable being flanked by two staircase pinnacles, each 70ft. in height. The exact length of the chancel of the King John church cannot be ascertained, but the first bay of present chancel, with the respond of the first pillars, are of the same date as the nave; and we can decide where the high altar stood. Within 50 years after the nave was lengthened, and the lean-to aisles added, it was decided again to increase the accommodation, by building the great aisles, first of the nave, and soon afterwards of the chancel also. Two causes led to this—the development of the fishing trade, and the custom now introduced of erecting private side chapels, either for guilds or mortuary purposes. As many as 20 chapels are said to have been enclosed within the aisles of the nave and chancel, and the remains of the chapel at east end of the south aisle of nave, and that in a similar position to chancel (more within the temporary vessel) will show how richly they were decorated. Traces of wall-painting, in the north aisle of chancel, indicates the position of Thomas à Becket's chapel. In 1847, when the pews were removed from the south aisle, which, since the Commonwealth, had been used for the parish church, the traces of the wooden partitions by which these chapels were formed are said to have been plainly discernible on the wall; even the doorways, with their images, in some places remained perfect. Unfortunately no record of the exact position of these partitions was made; the wall was replastered, and all evidence of their existence lost. The great aisles, erected in Henry III.'s reign, were 40ft. clear in width, just three times as wide as their predecessors; they brought the church into the three-gabled form, but the new roofs were enormously in excess of that of the nave. Two flanking pinnacles were repeated at the angles of the new aisles in correspondence with the existing ones next nave, with the evident intention to bring the western front into harmony. Professor Willis has noticed that the gabled junction of the aisles would allow the enlargement to proceed without interruption to the services. It has not been previously observed that the new ground inclosed had previously been a churchyard, and the builders had no hesitation in making use of stone coffins and monumental slabs as building materials. In rebuilding the south-west pinnacle and the west gable of south aisle in 1871, at least 30 of these stones were discovered—in some cases stone coffins had been cut in half, and built bottom upwards into the staircase, so as to form at once a riser and a step. It was probably the continued desecration of the churchyard, which a few years afterwards led a lady, named Sibilla Flath, to erect a calvary into which the disturbed remains might be collected and interred. The two aisles are said by William of Worcester to have been commenced in 1251. Probably within thirty years after the building of the nave aisles, those of the chancel were added It is asserted that the latter were consecrated in 1286 by Bishop Middleton, and if so the two heads which terminate the dripstone over the great eastern windows in the north chancel aisle represent the reigning King Edward I. and Middleton, then Bishop of Norwich. The extension eastward of the chancel was probably of the same date. The second bay of chancel was cut out of the solid wall, the arch not being built from the ground but roughly filled in. The chancel and its aisles have angle turrets, but of different form and height from those of the western front. A fourth and very remarkable stage in the history of the enlargement of this church is now reached. The aisles both of nave and chancel blocked up windows above the arch of the gable at the point where they meet the transepts. These closed windows prove that when it was determined to enlarge the aisles no care was taken at the same time to enlarge the transepts, and the effect must have been most extraordinary. It is probable that this defect was remedied within the decade 1320—30. The tower arches were then raised, and the Decorated capitals inserted; the transepts heightened and extended to their present dimensions. Externally they were supported at the angles by flanking turrets, and a beautiful door, the most perfect in proportions that the church possesses, was opened in the south transept. It seems to have been connected with the Fastolfe vault. Indications of the original transepts may still be seen in the two arches which open into aisles of nave and chancel. Except one, raised at a later date, they are all unduly depressed. The eastern arch of the south transept is splayed and singularly deformed; the western arch is uncommon, for it forms a simple semicircle. This arch has much perplexed the ecclesiologists; and Mr. J. P. Seddon, under whose advice the more recent alterations have been carried out, supposes that the jamb adjoining the tower and half of the narrow arch of the earlier south aisle were preserved, and that in order to accommodate these a large semicircular arch was turned; he also thinks that in each transept either two bays were turned into one, or else that narrow arches gave place to wider ones. We now come, not to enlargement, but to decoration. Whatever may have been the character of the original roof of nave south aisle it is certain that a line of carved bosses, bearing emblazoned shields, was placed at the intersection of the ribs during the reign of Edward III. These shields, which are arranged in order at the ridge line of the roof, are of very great interest. They contain the banner of the Holy Trinity, then the two-headed eagle of Austria, next the shield of Edward III., introducing for the first time the lilies of France into the arms of England, then the shields of four of his sons, those of John of Bedford and of Thomas of Brotherton, Bishop Spencer, of Norwich, and those of leading county families follow. The coloured scrolls, which are an exact reproduction of wall paintings, discovered in 1871, when the south aisle was restored, are pronounced by Mr. Gambier Parry to have been executed between 1150 and 1308, and were therefore painted when the aisle was built. In 1330 additional space was required for the side chapels, which continually were increasing in number, and a new extension of the nave and aisles, 47ft. westward, was commenced and carried up to a considerable height. Two western towers, with a gateway 40ft. in width, formed part of the design. This work, which was called the Bachelors' Aisle, progressed slowly, and in 1349 came to an end in consequence of an outbreak of the Black Death, which carried off 7,052 of the townspeople. Mr. Seddon remarks that there is no evidence to show the intended design of this extraordinary work, which was never attached to the main building. The irregularity and want of symmetry are peculiar, while the scale is great, and it is not to be regretted that the scheme proved a failure. Shortly before the Reformation the wave of Church Restoration transformed the windows of the aisles and transepts. At the Reformation the church suffered frightfully. The side chapels were demolished, the plate sold, the roodloft taken down, the magnificent reredos destroyed. In 1551 the sepulchral brasses were sent to London and sold for weights. In 1560 even the gravestones were taken out of the churchyard, and shipped to Newcastle to be turned into grindstones. During the reign of Elizabeth the turret of south aisle of chancel is said to have fallen, and crushed the roof and part of wall. Wooden windows of Tudor style were inserted. These were, unhappily, replaced in stone about 25 years ago. At the time of the Commonwealth the church was divided into three parts. A brick wall was built across the eastern arches of the tower and the two transepts. The chancel was assigned to the Independents; a door was cut by them through the canopied tomb of Thomas Cranmer and the seating altered for their accommodation. Although the altar had been replaced at the east end in 1645, a Scotch Presbyterian who saw the church in 1847 at once recognised the arrangement of the kirk. In 1803 the old spire, 186ft. in height, was taken down. The present spire was erected in 1806, when an Act of Parliament was obtained enabling the Corporation to levy for the repairs of the church a rate of 1s. per chaldron on all coal imported into the town. At the same time, the tower, which had been reported unsound, was pierced on all its sides to receive *cast-iron* girders, while the gable of the south transept was attached to the tower by a long iron chain. A large proportion of the coal-rate was spent on plastering the church, so that it was a common saying in Yarmouth, that if a man was out of work he must be put to plastering the church. The Bachelor's Aisle was taken down to form a foundation for works at the harbour's mouth, and the extreme point of vandalism was reached when it was seriously proposed to destroy the chancel aisles and use the material for the repair of the rest of the church. Since 1847 many of these disfigurements have been removed. The galleries have been cleared away, the columns in the nave replaced, the chancel arches opened, and the chancel restored to its old proportions. The tower has been thoroughly strengthened, and now would easily bear a spire of the original height. The south aisle has been re-roofed, its west front restored, and its magnificent window opened out. Much remains to be done: the south transept to be secured, the chancel aisles to be re-roofed, a new spire to be erected, and other works to be carried out, before the mutilation of centuries can be effaced and the church brought back to the splendour which it once possessed.

Mr. Brock said this church was a conglomerate mass which required much study before the outline of the original core and the processes of enlargement could be clearly ascertained. The first structure of 1119, if of the ordinary type, was a Norman structure, having three aisles terminating in apses, probably both at eastern and western ends, judging from the few fragments which had been found. It seemed so extraordinary that this Norman nave should have been entirely removed and rebuilt before the close of the century that one was led to question whether such a nave really existed or was merely contemplated. They were confronted by a second difficulty, that within fifty years two other changes were made in a comparatively new building. He had come to the conclusion that the east end of the nave was earlier than the western portion, and in support of this he referred to a doorway just uncovered at the west end of the church which was of earlier character than another doorway to the north of crossing, though both were of Early English character. Before the great aisles were completed the transepts were, he considered, thrown out, and this might be traced on the south side, where a clerestory window in transept of about 1220 had been blocked by the extension of the aisle. The west window of aisle agreed very well with the assigned date, 1271. His impression was that much of this work of Early English character, both to nave and its broad aisles, was done by the same hand, and one proof was that the necking represented on the doorway at the west end of nave and that on one to the north-west of the third pier were of the same character. One of the most interesting works was the Bachelors' Aisle commenced at the west end, in 1330, and stopped 18 years afterwards. What could have been the object of such an addition to an already immense building? It seemed to have been felt as disproportionate that the side aisles should be broader and larger than the central nave. The inhabitants of flat countries always had strong desires to erect lofty adjuncts to their buildings, which might be seen from afar; this was the case in Lincolnshire, the whole Fen district, and the numerous lofty and still unfinished towers in the localities visited during the congress afforded examples of this ambition. Possibly, as a result of the works at Ely Cathedral, there was at this period a disposition to revert to the old Saxon plan of a central tower, and another, or even two, at the west end, at Bury St. Edmunds, Wymondham, and St. Benet's-at-Holme. Of this Bachelor's aisle the foundations remained, and showed a very massive and exact square in centre, with wings ending in thick octagonal masses. Considering how large was this square block as compared with that occupied by the central tower, they could only conclude from the basement plan that a lofty campanile was proposed to be flanked with lateral wings and turrets, which would act as gigantic buttresses. Such an idea was carried out at Ely, at Lincoln, and Salisbury. On this work being stopped by the Black Death in 1349, the portion which had been erected to a height of 60ft. was never again proceeded with. Another plan was adopted to add dignity to the church. Already the low Norman tower had been raised by an additional story in the 13th century, but it must have been very disproportionate, even if it had in addition a spire of moderate height. The 14th century builders erected a wood and lead spire rising to a total height of 186ft. from ground; that feature was unfortunately removed about seventy years since, and replaced by the present clumsy spire. The great alterations made to the tower arches by these Decorated builders could be easily detected. Two arches had been strengthened to carry the Early English stage, and now the other two were similarly treated to carry the weight of the spire. He had been asked where the chapel referred to as that of St. Mary of Arneburgh stood. He would suggest that it was at east end of chancel, for in no other place could a building described as having had "a vaulted roof and dovecot above" have avoided blocking up lights. The three arches in the south aisle appear to have been closets in an eastern vestry. He would like to add a word or two as to the restoration of the church. Such a work in a building of this size was a testimony to the zeal, energy, and self-sacrifice of all living in the town, and it would be a pity to expend any of the money contributed in such a spirit otherwise than in the most judicious manner. It had been proposed to replace the north aisle with something corresponding with the south aisle as re-roofed, to rebuild the south transept, replacing the genuine Perpendicular insertions with modern Early English windows, and to take out the aisle windows and make all uniform. These proposals amounted to an entire remodelling of the exterior. The north aisle roof was ancient and might be put in repair, he should be sorry to see it altered, and still more so to see it treated as the southern had been done. He regarded the throwing the south aisle and roof into one span as a grave mistake. Though the Perpendicular window in the south transept was not elegant, yet it was a part of its history, and the alteration would consist in replacing that which had a real meaning with something doubtless more beautiful, but at best mere fancy. It was proposed to bring all to the character of work about 1250, but he submitted that the old tracery formerly in the east window had approached the Flowing Decorated, and would not agree with that date. This proposal to bring all the work in the church to one date was not one which would have been adopted by the Mediæval builders: it would destroy the records of the changes which made the building so interesting, and the structural alterations would still be apparent in places, and would not harmonise. The money that had been so generously given would have been much better spent in acting upon the golden principle of conservative restoration—simply to repair, and not to introduce new work, and in rebuilding the central spire as it existed prior to 1806. He trusted these arguments would be tested by the aid of reason—if his views were wrong, reject them; if right, follow the conclusions logically enforced. Although he felt obliged to protest against the line to be adopted in this restoration, he had no personal feeling towards his professional brother engaged in it, except that of high admiration for the work Mr. Seddon had carried out here and elsewhere. It was not altogether the architect who was responsible for schemes of restoration and the form they took; he had himself smarted under the feeling that an architect was often influenced by members of a committee to do what, if free, he would not attempt.

Mr. Lambert expressed strong doubts that gravestones could be worked up as millstones, Neville and inquired as to their grit; Archdeacon Neville said that Manship, the old historian of Yarmouth, was his authority for the statement. Mr. Morgan mentioned the great number of guilds which once existed in Yarmouth, and reminded members that besides being the trade associations and religious societies of the day, guilds in some cases discharged the functions of sick and funeral clubs. The various buildings of interest in the town not seen on Monday were then visited under Dr. Raven's genial leadership, the first being the *Prior's Hall*, on the south side of the parish church, a nearly perfect portion of the Benedictine monastery. It was restored at the cost of the corporation in 1852, from the designs of the late Mr. J. H. Hakewill, and now lodges the national schools. The great hall remains entirely perfect; it forms the east end of the buildings, is about 60ft. by 30ft., and has several much dilapidated windows of Late Decorated character, and a restored plain hammer-beam roof, with ordinary collars and braces above the principals. At the west end is the carved stone screen of almost Flamboyant character which once divided the hall from the buttery and kitchen, and now leads to more modernised school buildings of two stories. The *Star Hotel*, on the quay, the headquarters of the Association, was also visited. It is an Elizabethan merchant's mansion on the quay, formerly the residence of the Bradshaw family, and still contains a wide staircase, with good balusters, low risers, and much worn treads, much panelling and wainscoting, all in black oak; and in the kitchen, once the banqueting-room, are remains of a handsome pendent ceiling and mullioned windows. They also entered the residence of Mr. Christmas, Market-road, where they inspected a large collection of oil paintings, old china, and other curiosities of which Mr. Christmas is the possessor, occupying several large rooms, erected in the garden for the purpose of accommodating the collection. *St. George's Church*, built in 1712-15, was next inspected. It is a heavy Early Georgian structure of brick, with wooden turret on tower, round-headed windows, plastered domical vault, open lantern, wooden piers, ponderous pulpit, with the original massive sounding-board, heavy enough, should it fall, to kill the soundest divine, and high pews of the period. The *Tollhouse*, a small quaint building in Middlegate-street, was the last building seen. It seems to have been built in accordance with a charter granted by King Henry III. in 1261 as a gaol, and is used not only for that purpose, but as a town-hall, sessions-house, and borough and (till 1823) Admiralty courts, in accordance with the charters granted to Yarmouth by King John in 1208 and Queen Elizabeth in 1559 for those purposes respectively. In 1362 Stephen de Stalham, a burgess of Yarmouth, left this house to his wife, and by some means it afterwards appears to have passed into the hands of the corporation. It consists of a low, two-story building, with quaint external staircase on the street front, leading to a landing on first-floor. This landing has a two-light Late 13th Century window, with deep neckings and mouldings, shafts in the jambs, and each cusped in five foliations. There are other windows in the front, which were altered when the hall was repaired in 1552. From the lobby a small low room is entered, having dimly gilded and coloured Jacobean dais and state-chair; and to the left of these is a 13th Century doorway, with tooth ornament on either side of the central fillet in the arch mouldings, but not in the jambs. Below is the lock-up. Dr. Raven explained that in the lobby, till 1866, the Parliamentary candidates addressed the burgesses from the head of the staircase. Mr. J. A. Picton, of Liverpool, said that in Scotland the tollhouse and gaol were associated, but in no other English town than Yarmouth. Was the origin of this anomaly understood? This did not appear to be known; and after some discussion on the ancient privileges of the borough, the perambulation was closed by the passing of a cordial vote of thanks to Dr. Raven for the knowledge and courtesy he had displayed in exhibiting to visitors the local lions.

GORLESTON.

In the afternoon a visit was made by tramcar to the high-lying suburb of Gorleston, at the Suffolk side of the river's mouth, where the *church* (St. Andrew), formerly attached to the Priory of St. Bartholomew, Smithfield, was inspected. Since the impropriation fell into lay hands in 1553, the church had fallen into decay until recently, when it was restored under the direction of Mr. J. T. Bottle, of Yarmouth. It consists of uniform nave, aisles, and chancel, in eight bays, 124ft. by 64ft., the north aisle being wider than the other lateral divisions of the church. The style throughout is Decorated, verging on the Perpendicular, and with a little earlier work. The internal appearance is very handsome. The tower, also, following the East Anglian type, is large, carried to the height of 94ft., and there left unfinished, the parapet and string-course below being left uneven. The font is a fine one, like that at Southwold, adorned with the Seven Sacraments, in high relief, but the eighth panel is occupied by the Day of Judgment, and like that example it was greatly hacked about by Francis Jessope, of Beccles, who records with glee in his journal, how he brake various superstitious pictures, glass, and images, the organ and altar-rails, and did out the Popish inscriptions, and sent the brasses to London. A large brass to one of the Bacon family, representing a knight, tempo Edward II., wearing a small "heater" shield with cyclas over body armour, disappeared from the Bacon Chapel about seventy years since. It was recovered somewhat mutilated at a collector's sale, by Mr. Rokewood Gage, who returned it to the church, and it now is affixed to the wall of the north chancel chapel. It had been intended to visit the remains of Gorleston Priory, but this was abandoned, and the members walked to Ferryside House, the residence of the Mayor of Yarmouth, where they were hospitably entertained.

In the evening a meeting was held at the town hall, the mayor presiding. Mr. W. de Gray Birch, F.R.S.L., gave some interesting particulars with regard to the charters of Yarmouth, and also read a paper on Seals. Mr. Brock also informed the meeting that he had just received information of a discovery that had been made in Durham of a genuine Saxon church, now used as a dwelling-house. The nave was only 48ft. 5in. long, and 14ft. 4in. wide, and the chancel 10ft. square. The discovery of that church had not yet been made public, and they were the first to receive the information.

The remainder of the evening was taken up in proposing votes of thanks to the gentlemen who had taken an active part in the Congress, the Mayor and Corporation, and the hon sec., Mr. E. W. Worlledge, being warmly thanked for their services. Thanks were also given to Mr. Geo. R. N. Wright (secretary) for his affable and courteous conduct and admirable management, and also the readers of papers and those who had entertained the members of the Congress, both in Yarmouth and during their excursions. Dr. Raven was especially thanked for the assistance he had given the association.

MONDAY.

THE CONGRESS AT NORWICH.

On Monday the headquarters of the Association was removed from Yarmouth to Norwich, and in this ancient city the archæologists found scope for employing all their powers of observation of things quaint and surrounded by historical associations. Indeed in its Norman and Perpendicular cathedral, its quaint Guildhall, its monastic remains—St. Andrew's Hall ranking chief—its numerous churches, most of them having a bewildering family likeness in unbroken roofs, square parapetted towers, flint and panelled walling, many-transomed windows, debased octagonal piers and fonts, and rich woodwork—its picturesque bits of gabled and half-timbered merchants' houses peeping out of narrow courts and crooked streets, its mediæval grammar school and modern museum, its cathedral gates and civic walls and towers and bridges, not to allude to the re-cased castle concealing a Norman core, on a moated mount: too much was crowded into ken, and the members returned, after making the circuit of the city, having seen more than could be remembered. The out-of-town meetings afforded agreeable breaks in a congress of hard work—to the studiously inclined.

The Norwich meeting was appropriately commenced in the Guildhall, a small flint-faced structure by the side of the great market place, rebuilt in 1407—13. Here the members were received by the mayor (Mr. Bullard) in a cramped and stuffy council chamber, with oak wainscoting carved in the common linen pattern, relieved by the arms of guilds and grandees with which it was garnished in the second quarter of the 16th century, and with the addition since that time of painted glass of all dates and qualities, numerous paintings, a sword taken from the Spanish Admiral Don Xavier Winthuysen, maces, &c. The entrance to the Guildhall is through a very rich Perpendicular doorway, with spandrels and canopy carved with free foliage. Above the head are the arms of Henry VII., in the sinister spandrel are those of the city of Norwich, and in the dexter, those of the Goldsmiths' Company. In the soffits are niches with ogee canopies. It is said to have been built by John Basingham, goldsmith, in the reign of Henry VII., and was the residence of John Belton, goldsmith, in the reign of Henry VIII. It formerly composed the entrance to premises at the east end of London-street, now occupied by Messrs. Pigg, but in consequence of the rebuilding of the house has been removed to the Guildhall. We reproduce the illustration on next page from Mr. J. H. Parker's carefully-written "Domestic Architecture." The members soon walked down to

THE CATHEDRAL,

wherein a long morning was spent inspecting the fabric throughout, under the guidance of Dean Goulburn. The chief points in the cathedral, as sketched by Mr. Thomas Morgan in an after-luncheon speech, are the sudden transition from Transitional Norman to the full development of Perpendicular, the extraordinary variety and number of bosses, "with stories richly dight," if we may thus pervert Milton, and the discovery of the Norman bishop's throne. Two, yea three, other distinguishing features may be noted, positive and negative: the strange absence from a cathedral of the use of flint and panelled work, situated though it is in the very heart of a district famed for its repetition of this application of masonry, the paucity of monuments and effigies, and the abundant traces of mural painting, both figure-work and merely decorative, revealed during the removal of hundredweights of whitewash from the internal walls.

The Dean welcomed the members to his precincts in a barrel-vaulted 14th Century building to the north-west of the nave front, now used as a school-room, and proceeded to read a paper on the history of the cathedral, tracing its rise from the laying of the first stone, as an adjunct to the Benedictine monastery, by Herbert de Losinga in 1096 onwards. This structure comprised only the presbytery aisles and transepts, but between 1121 and 1145 Bishop Everard commenced a nave and its aisles. In 1171 the cathedral was greatly injured by fire, but was repaired by Bishop John de Oxford at the close of the 12th century. Another fire took place almost exactly a century after the first, and the church was reconsecrated in 1278, in the presence of Edward I. and Queen Eleanor. To the tower a spire was added in 1295, but was blown down within 67 years. There had been Norman cloisters of wood, Dr. Goulburn believes; and in 1277 Bishop Walpole commenced their replacement in stone, with the west walk. The work was continued in various places and was not finished, according to William de Worcester, till 1425, although this probably referred to repairs. About the time of Edward II., in the first quarter of the 14th century, was built the Beauchamp chapel (more properly that of St. Mary-the-Less, the "Greater" being the Lady chapel at the east end, built by Bp. Suffield, c. 1250, destroyed after the Reformation), to which a groined roof was added by Seckynge in the 15th century. This chapel, they would see, was adorned with numerous frescoes, while the bosses in the later ceiling were most grotesque. Dr. Bond, of the British Museum, had suggested that it was built during the latter years of Isabella the Cruel and Hypocritical, better known as the "She-Wolf of France," who lived in Norfolk as a semi-nun during her latter years. The old spire having fallen and injured the south-east clerestory, Bishop Percy rebuilt both, but in the style now fashionable about 1362, and to this alteration in design the cathedral as viewed from without owed, he thought, its greatest charm. About the close of the first third of the 15th century Bishop Alnwick rebuilt also in his own style the Norman west front. In this façade Bishop Walter de Lyehart inserted its great seven-light windows between 1445-72, and replaced the wooden vault of nave with its present beautiful stone vault, adorned with sculptured bosses, on several of which may be seen his rebus—a hart lying in water. Bishop Goldard, his successor, who died 1499, aided by an indulgence from his friend Pope Sixtus IV., carried out the upper part of the east end, excluding its vaulting and clerestory and the lower stage of the presbytery, in the south aisle of which he built himself a chantry. His rebus, as the lecturer pointed out in the presbytery afterwards, is constantly repeated in his roof, a well or with water azure. Lastly he came to Bishop Nix, who bore a bad name in Norwich for his last cruelty and persecution of the Lollards. He vaulted the transepts in uniformity with the nave and presbytery.

Dr. Bensley followed with a description of a rich and rare collection of choice MSS., charters, the Norwich Doomsday Book, a record of all the churches and benefices in the diocese, ascertained from internal evidence to have been written c. 1420-40, priory and convent books, a history of the foundation and progress of the cathedral from 1096 to 1320, penned in 1326, and one of the ten sealed books of common prayer—this, by the bye, and that at Chichester being the only copies uncollated and unedited in our own day, and Dr. James's MSS., written at the beginning of the 18th century. Sir Francis Boileau, in seconding a vote of thanks to Dr. Goulburn for his paper, which had been proposed by Mr. De Grey Birch, referred to the dean's exhaustive work on the bosses in the cathedral, illustrated by photographs; and in acknowledging the compliment, the dean intimated that he proposed to publish a similar work on the frescoes and bosses of the Beauchamp Chapel, but illustrated by line-drawing, executed in the chapel, instead of photography, the result of which was scarcely satisfactory, from an artistic point of view.

The members then visited the cathedral, Dr. Goulburn acting as showman, and with anecdote and story enlivening the pilgrimage, which, although discussions were not permitted, temptingly as occasions arose, was prolonged over two hours. The Benedictine adjuncts to the cathedral* were first seen. The cloisters, the largest in England (about 175ft. square), afford, from the south walk, the finest view of the cathedral (except that so frequently painted, from the south-east). Looking up from the much-varied, flowing and square-mullioned fenestration, we see to the right the low roof of the cloister, with the dull mass of the south transept above; and to the right the much-interrupted Norman arcading of the aisles, over which is a range of triforium and clerestory lights, with battlements above, and long nave roof, sagging here and there from the weight of stone back and lead casing on marshy foundations. At the angle of these roofs rises the enriched Norman tower, with reeded angle buttresses and tiers of lancets alternating with pierced and open circles. Within the parapet and its pinnacles rises an octagonal spire, which appears somewhat distorted at places on close scrutiny. This view from south-west of the cathedral crossing is more picturesque than the similar one to be obtained from the cloisters of Westminster or Worcester, but is greatly surpassed by that at Salisbury. Passing through the cloisters, the monks' lavatory troughs were inspected at this angle, and the visitors passed out of the garth to see the ruins of the infirmary chapel, pulled down all but a few pillars, in 1806. Turning back to a space above the cloister angle, the traces of the refectory, which occupied this site, were inspected. The springers are still in position on the north side, and from the *débris* have been collected and set up the first bay of a blind double arcading, with crisply voluted capitals to shafts, which seems to have been carried round the hall with flat buttresses at intervals. The refectory was vaulted in stone over the side aisles, and as Dr. Goulburn suggestively remarked, only funds are required to provide a magnificent reception room for the Archæological Association at their next congress in the city. Mr. Brock said the only other example he could recollect was one of the desecrated monasteries in Paris. Returning to the cloisters, on the east walk, opposite the site once occupied by the chapter-house, is a stone at the yard level, inscribed with the name of its founder, Bishop Walpole (c. 1308) and its builder, Uphall. Dr. Goulburn said it had become more worn since he had known the cathedral, and asked what steps should be taken to preserve it, or might he recut it? The general opinion seemed to be that he ought to do so, following the traces of old letters. At the Prior's Door, leading into the church, a controversy arose as to the figures represented under the fan of seven canopies worked athwart the head-mouldings, the Dean suggesting that a figure holding a church in his hand, next that of our Saviour in Majesty, was that of the architect-bishop, whereas Mr. Lambert pointed out that this was the conventional symbol of St. Boniface of Metz. Dr. Goulburn stated that St. Boniface does not occur in the series of illustrations of the saints' lives forming the bosses of the south walk, next seen. Walking down the cathedral from the west end the grand effect of the nave, massive piers, circular aisles, carrying open triforium of equal height and boldness, a clerestory, the shafts of the piers melting into the magnificent lierne vault now again touched in the bosses with gold, vermilion, and blue, was very fine. The three eastern bays, it was shown, in accordance with Norman usage, were included in the choir, the division being marked by an immense circular column on either side of nave, on each of which pillars are cut deep spiral lines. Thus far the archivolts have been adorned with the double billet-moulding, but in these three bays the zigzag replaces that ornament. In the centre of nave is a large circular opening through which the figure of a censing angel (? possibly of dove) used to be let down on great festivals. The aisles are simply vaulted in stone, and above are spacious triforia left quite open and lighted by great Perpendicular lights from behind. The lower part of organ screen is by Bishop Lyehart, and on it stands the organ, almost shutting off the through view from west to east. Passing into the south transept, the small vaulted room at the N.-E. angle, till very recently the prison of the precinct's liberty, was hastily glanced at. The last exercise of the privilege of imprisonment, like that "in another place," seems to have been a farce that practically abolished the right; the prisoner, being a musical man and well fed withal, was loth to leave such comfortable quarters, where he could hear the training of the choir boys. The next of what was once a chevet of chapels is the Beauchamp one; the sculptured bosses are carved with events in the life of the Vigin Mary in ludicrous style; the recently discovered frescoes are interesting. The next chapel, that of St. Luke, is planned on the intersection of two circles producing an oviform figure. It has been restored and now forms the parish church of St. Mary-in-the-Marsh. Following the processional path a little farther we come on the only Early English work, two eastern arches, with dog-tooth mouldings in the soffits, and beyond, on the north side, is a second egg-shaped offset (Jesus chapel), for the painting of which Dr. Goulburn mentioned that he had got into trouble with those opposed to restoration. He showed, however, that the whole of the decoration (glaring as it undeniably is) is simply a brightening of the old colour that existed under the yellow wash, and still can be seen in other chapels; not even a broken moulding has been repaired In the chancel of this chapel is a "sealed altar," recently discovered, a slab of limestone, in which is embedded a piece of Purbeck marble marked with the five crosses; the whole has been set on five twisted pillars copied from one at Rouen. The presbytery was next entered by steps, and at the east-end was seen the gem of the recent discoveries—the original bishop's throne, consisting of a block of stone with sedilia on either side. Beneath, at the back is an opening lighting what seems to have been a reliquary. The Dean expressed the hope that the bishop would yet again bless the Sacrament from the original chair, standing with his face at once to the altar and to the people. The canopied recesses on the south side of the presbytery were noticed, and Dr. Goulburn said he would not allow the project to be executed in his time, as had been urged by distinguished architects, of removing this Perpendicular work, and making the eastern limb and its apse uniformly Norman. Debased as the work was, he felt he had no right to remove a page of history from the cathedral—a declaration received with applause. Returning westwards, after looking in the north transept, partially shut off by a very Late Tudor screen, the choir seats, with their rich oak carving and a multiplicity of ogee arches, foliated pinnacles, and cuspings and intro-cuspings, were examined and the visitors passed out by the north-west door. In again passing through the nave, the Dean related the following anecdote, apparently as a note of caution against undue pushing of the "inferential archæology" eulogised in the presidential address. Pointing to a series of iron staples and rings on the north aisle side of the arcade piers, Dr. Goulburn said for a considerable time they had greatly puzzled investigators. When he came to Norwich the common impression was that they were driven in by Cromwell when he stabled his horses in the cathedral. He ventured to doubt this, and after examination of them he propounded in a descriptive card, and hung up in the cathedral, the theory that these were in pre-Reformation days used to rope off the people in the nave from interfering with the gorgeous processions in the aisles. After publishing the guide he left Norwich for a while, and on returning asked his verger if he had read his new cards. The man seemed amused, and replied, "Well, yes, I have." "Do you like it? What are you smiling at?" he inquired. "Well, sir," replied the old verger, "it's all right enough, I daresay, except about those rings; but I drove them staples in myself to keep the people in order when Bishop Bathurst was consecrated." The west front of the nave recently showed signs of failure, and is being rebuilt from the designs of Mr. James Fergusson and Mr. Brown, of Norwich, architect to dean and chapter. From a comparison of a photograph of the former front with that now being completed, we see that the old Late Perpendicular work is being generally followed, but some changes are introduced into the apex of gable, from which the scaffolding is being removed. The new cross is of better proportions, and just below, a Perpendicular window replaces the niche, placed in quite modern times over the head of the great window, the stained glass in which is, we hear, to be replaced, poor as it admittedly is, on account of its being the memorial to Dean Stanley. This completed the survey, and the visitors lunched together by the Dean's invitation in a marquée in his garden.

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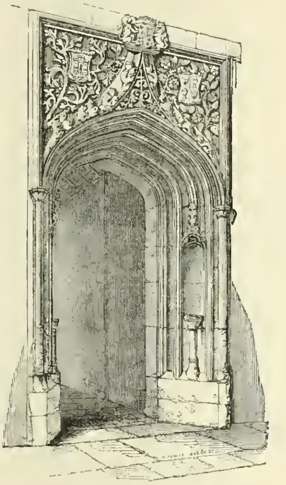
* See the Rev. E. C. Mackenzie Walcott's article and ground plan of the monastic buildings, published in the Building News during August, 1878.


DOORWAY, NOW IN NORWICH GUILDHALL.

Under the leadership of Mr. Phipson, the members next visited a series of ecclesiastical buildings, beginning at the Bishop's palace to the north of the cathedral. Part of the structure, that now used as the kitchen—an immense vaulted apartment—the cellarage beneath the present servant's hall, the lower portion of the private chapel, are all portions of Bishop's Palace, built between 1300-25. They contain much simple quadripartite vaulting with plain ribs and plastered webs, and are built of rubble and squared masonry. A plan of the original palace was shown, and displayed a much more extensive building than the present. Till within the last twenty years a quaint covered passage communicated between the palace and the north aisle of the cathedral nave, but this is now cut off and the spaces walled up, so as to obliterate all trace of the openings. In the garden, quite detached from the other buildings, is a picturesque ruin covered with ivy, consisting of four groups of clustered piers and shafts, supporting an upper room. The ogee arches on the under sides and the mouldings show that the work is Late Decorated, but opinions were divided as to whether this was a detached entrance tower, or if it formed a portion adjoining the palace buildings.

The *Grammar School* is an Early Perpendicular building of four bays, greatly restored on the principal façade. It was used as a charnel-house, with chapel above, till 1540, when it was cleansed and devoted to its present purpose. The curious open staircase and porch on the front were added by Bishop Lyehart about 1450. From this portico an oak door, carved with vigorous scroll-work, opens into the chapel.* Most of the windows are modern reproductions, but the four old ones of crumbling freestone exhibit a very late flowing tracery, like those at Ely Chapel, Holborn. The mouldings have been decorated in colour. The crypt has a groined vault, like those at the Bishop's Palace. Next was viewed the *Erpingham Gate* to the Cathedral Close, a unique and highly-decorated edifice, erected by Sir Thomas Erpingham in 1396. On the outer or western face, that towards Tombland, the archivolts, spandrels, and the half-octagonal flanking buttresses are profusely adorned with sculptured figures under canopies and shields of arms. In the gable of this front is a canopied niche with a kneeling statue of a knight, while on either pinnacle is a mouldering figure, one of which has been identified as a secular, the other as a regular priest. The Close had been entered, we should have mentioned, by the members through the southern gate, that of *St. Ethelbert*, erected by the citizens in 1272, a wide structure with a finely groined and embossed vault, a profusion of niches and flint panel work on the chief front. The upper portion, including a large flint wheel ornament, had been restored in modern times. It is noticeable that all the decorations of these gates is reserved for the city side, and that both have apartments above.

The next point of interest was the great church of the Dominicans or Blackfriars, rebuilt by Sir Thomas Erpingham, who died in 1422, before it was completed. At the Dissolution the citizens acquired the whole building from the king, by the intercession of the Duke of Norfolk, for the moderate sum of £81. The nave "St. Andrew's Hall" has ever since been devoted to civic purposes, and is the largest and most magnificent common-hall in the kingdom. The corporation have leased the chancel to the Dutch church for 200 years at a few shillings a year, and the few representatives of that nation sub-let it to various denominations — at present to the Primitive Methodists. This lease falls in in about twenty years' time. The exterior of the building is very plain, and was refaced with flints and thoroughly restored by Mr. T. D. Barry, late borough surveyor, some years since. It loses much from the lack of the hexagonal tower, formerly at the crossing, which fell in 1712. The chancel of four bays has been paved and greatly altered within; the roof is plain, with carved wood bosses; the windows are good five lights, that at the east end being of seven lights. Some difficulty was felt as to this last window, which is filled with flowing tracery, apparently earlier than the assigned date, but Mr. Phipson explained that the fashion in fenestration changed late in the 15th century in Norwich, and that in many of the churches windows of this character might be seen, of which there was proof that the work was later than it seemed. The nave and its aisles, shut off from this chancel by plaster partitions, are admirably proportioned, and the richly ornamented hammer-beam ceilings, the large clerestories, the lofty and wide series of seven moulded arches beneath, divided by octangular shafts, the panelled oak-work, the grand Perpendicular west window, all contribute to the noble character of the building; and the modern fittings of an organ and orchestra, filling up the east end, the low seats, and the very fine series of full-length portraits on the walls, add to the grandeur of effect of St. Andrew's Hall. The proportions are—nave, 124ft. by 32ft.; and aisles, each 124ft. by 16ft.

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* Illustrated in the Building News Sketchbook series.

St. Andrew's Church, close by, ranks next to St. Peter Mancroft in size and importance. It is of the usual Norwich type, and is entirely Perpendicular. It was rebuilt in 1500, with the exception of the tower, which is 20 years earlier. It consists of nave and chancel under one rich hammerbeam roof, divided from north and south aisles by octagonal piers, carrying ranges of clerestories. There are remains of a little old stained glass, and of sedilia and misereres. Here a young archæologist, Mr. R. F. Beecheno, read a paper on the history of the church. When looking at the Communion plate in this church, a hanap was pronounced by Mr. Lambert to be one of the best in existence of the period, middle of 16th century. Next, the members went into the *Strangers' Hall*, in a court off St. Andrew's-street. It seems to have been built by Nicholas Sotherby, some time Mayor of Norwich, who died in 1540, and is interesting as giving the last stage of Perpendicular work. In the banqueting hall, a fine apartment on the first floor, are an oriel window on south, an eastern staircase finely carved in Renaissance style, with admirable carving on the string below the balusters, and a hammer-beam roof. Above are several rooms with oak panelling and Jacobean moulded ceilings. Tradition declares that it was a guest house of the Dukes of Norfolk, and it is now used by the Catholics as a school. Mr. Brock spoke of it as a very valuable example of a merchant's house of Henry VIII.'s time, rendered more interesting by slightly later fittings. *St. John Maddermarket* is a Perpendicular church, with aisles and clerestories, a fan tracery roof, some fine Elizabethan and Jacobean monuments, and some brasses. A public passage runs through the tower, and a street passed under the chancel, now destroyed. *St. Gregory's*, the last of a long programme, was built in Henry VII.'s time, having aisles, clerestories, and single open roofs from east to west. Upon the Decorated font is a good font cover, the upper part consisting of eight eagles' necks and heads, ringed together, with Early Renaissance ornament on every surface. On the south-west wall is a fine fresco of St. George and the Dragon, discovered by Mr. Phipson when restoring the church in 1864.

TUESDAY.

But little archæological work was done to-day, the morning being occupied in visits to three of the principal churches and to a "palace," and the afternoon in a carriage drive a few miles out of the city, with a pleasant visit on the way home, an evening meeting closing the proceedings.

At the Guildhall in the morning Mr. Phipson described the ancient boundaries, walls, and gates of the city with the aid of a map, drawn about 1500. He also gave a running description of the principal churches, stating that most of them were rebuilt in the 15th century, but a few exhibited features of the Earliest Norman work; he could not agree with the theory that any had Saxon features. Mr. Brock said they would see in the round tower of St. Julian's church that afternoon that the windows had a double splay, and that they were placed north and south instead of east and west—features which he considered afforded evidence of Saxon work. Mr. W. de Grey Birch followed with a description of the charters and seals belonging to the municipality, displayed in the room. These documents he pronounced to be the best preserved in the kingdom; each was usually inclosed in a labelled tin box, and the seal was sewn up in the original silk bag. The first charter displayed was granted in the fifth year of Henry I.—1129, a fact they ascertained from internal evidence, and separated the town from the castle property. There was another of the first year of King John, and three each in duplicate by King Henry III. This duplication of charters was carried out to protect them against the chances of fire, natural decay, and abstraction or injury, only the attested copy being produced when required in court. The cases were early and fine examples of silk manufacture, of course hand-woven, and he believed now incapable of imitation.

St. Peter Mancroft Church the largest and most important in the city, was first visited. We recently published an abstract of the exhaustive report of Mr. G. E. Street on this interesting fabric, and so will only mention that the church was rebuilt 1430 to 1455, that it is cruciform, and has a rich western tower 98ft. high, still unfinished, large clerestory and aisle lights, and at the east end are two Renaissance octagonal turrets. The main roof, in one span throughout, has a small wooden fan vault over each window, above each of which springs the principal of an open roof, decorated with angels and the suns of York. Mr. Phipson mentioned that the present stalls were erected about 30 years ago, from a design of his which won a competition; he must apologise for the character of the work, for he was then not three-and-twenty. At the east end of the church is a vestry in three stories. The restoration of the church, which is still unfinished and in a state of dangerous dilapidation in parts, is about to be undertaken at a cost of £13,000. *St. Stephen's Church*, also in the Market Place and close to St. Peter's, is a large church of later Perpendicular than that edifice. The chancel was rebuilt between 1501—21, the nave by 1601. The arcades are very lofty, and there are flat square panellings on the columns. The chief roof is remarkably rich, hammer beam, with open carving below, and brattishing above wall-plate and in spandrels of principals. The large east window, Mr. Tom Burgess pointed out, contains dated glass of several periods, and has been arranged with the figure of St. Christopher on the north and Our Lord bearing His cross on the south, with a priest instructing a woman and a mother her boy, one on either side of central light. The interest of the window is increased by the fact that three portions easily recognisable are dated, either in Roman or Arabic figures, with 1483, 1523, and 1610; this system is continued elsewhere in the church, for under the west window is the date 1550, and on the north front 1610. The font has a Jacobean open iron cover, now gilt and surmounted by an eagle. There are a series of alabaster panels of saints, some interesting manuscripts in the vestry, including a Latin Bible written on vellum, c. 1340, and a 12th century copy of the Pauline Epistles, with gloss. *St. Giles's Church* is also a rebuilt church (tempo Richard II.) of Early Perpendicular type, and was restored by Mr. Phipson some years since. Its best features are a west tower of flint work 120ft. high, surmounted by a lantern, and the panelled and groined south porch. The clerestory ranges only one to each bay of arcades, and the aisle lights are not so large as in the previous churches viewed, making the building appear comparatively dark. The nave roof is hammer-beamed, with angels at the springers. The members then walked down to the suburb of Heigham, where was seen the house occupied (1647-56) by Bishop Hull, after being deprived by the Puritans of his mitre and see. It now is known as the Dolphin Inn, and is Late 15th Century, with traces of earlier work. There are a portion of oak staircase, a plaster ceiling in one room, and a carved Elizabethan oak door. Two dates are worked into the front—that of 1587 over the door, and 1619 in the flint-work.

In the afternoon a carriage outing took place to

ARMINGHALL

and Carrow. At the former village the *Church*, a Decorated structure, completely restored by Mr. J. P. Seddon, was seen. The floor, seats, roof, plaster internal faces to walls, and fittings are new, the only remains of the old structure worth notice being some good poppy-heads which have been judiciously fixed on to the chancel benches. More interesting is the *Old Hall*, now a farmhouse. The building itself is Late Elizabethan, of timber and moulded bricks, with tiled roofs; but into its walls are worked an extraordinary series of panels and plaques of terra-cotta, of which nothing is known as to their origin or former purpose. On the south side is a large porch of rich Decorated character, with a series of figures of lizards among foliage sculptured on the archivolts and jambs of the entrance. On either side is a seated figure of an old woman, and above, in an ogee-canopied niche, a bust. Within the porch is a panel, grotesquely sculptured with the story of the Lion Rending the Disobedient Prophet. To the left of the porch is arcaded woodwork of Elizabethan character; at the rear is a door adorned with carvings of the vine and with busts; plants and other ornaments in terra-cotta, now unfortunately, thickly coated with plaster, are dispersed, apparently haphazard, over the building. The remains have been supposed to have come from Carrow Abbey, but of this there is not the slightest proof. A discussion took place on a Lombardic inscription on the oak door within the south porch, which has a prayer for the soul of Maister William Gladwyn, followed by a date in Lombardic characters, which seemed to be 1487, but nothing could be discovered with reference to the curious carvings.

CARROW ABBEY,

now the residence of Mr. J. H. Tillett, was then visited. The members were welcomed by Mr. Tillett, who, after the house had been inspected, read a paper upon its history. He explained that, with various additions fitting it for domestic purposes, it is the last prioress's residence. The abbey was in existence as a hospital early in the reign of King Stephen, and in 1146 two sisters, Seyna and Leftilina, founded a Benedictine nunnery. The domestic buildings stood on the site of the present house, and to the south was a cruciform chapel, dedicated to the Blessed Virgin, with graveyard around, in which human bones have often been found. The nunnery then covered, with its grounds, an area of 10 acres. In 1199 John granted the same rights as to a fair to be held by the nuns in Trowse hamlet as the Benedictine monks possessed. In 1228 the charters were confirmed, and some time afterwards Pope Gregory X. issued an interdict (still in existence) to the prioress against receiving more nuns than they could support. A list of most the prioresses from 1198 to 1530 is preserved by Blomefield. The last prioress known was Isabella Wygun, who seems to have built the existing domestic apartments. It was to the last prioress of Carrow, that Skelton, poet laureate, addressed some doggrel verse on the death of her favourite bird "Philip Sparrow." At the Dissolution, the advowson of the priory was given in 1539, by Henry VIII. to Sir John Shelton, knight, uncle of the unfortunate Anne Boleyn, who lived here. His relict left to her son, the second Sir John Shelton, all her hangings, tables, cupboards, fireplaces and stoves, in her "great parlour," so that there is good evidence that the existing parlour is of that date.

The old portion of the house is of the date of Henry VII. with some alterations; it consists of the parlour on ground-level, a dark and handsome room, panelled on every portion of walls, and with fine beamed ceiling, also of oak, now nearly black. Above this is a small bedroom reached by a turret, and over the corridors a third apartment, supposed to be the refectory. In the spandrels of the fireplace and door in the parlour, and of the beam in the open roof of the refectory, is repeated the rebus, a letter Y and a rude carving of a gun—the rebus of Isabella Wygun. In the grounds are a portion of the south wall of chapel, containing a piscina in portion, several fragments of rubble masonry and outer inclosing walls. The seal of the abbey, of ogival form, and representing the Virgin and Holy Child, is now in the possession of Mr. John Gunn, who exhibited engravings of it. All the domestic remains agree closely with the assigned date. The visitors afterwards partook of tea under a wide-spread "weeping willow," and then walked through the beautifully laid-out grounds of Mr. J. J. Colman, M.P., which adjoin Mr. Tillett's. In the principal suite of rooms at Mr. Colman's house, a splendid series of paintings of the Norwich School—including those of the Cromes, the Cotmans, W. P. Hunt, Drake, Lance, and others, and beautiful crayon portraits of the juinor members of the Colman family, were examined with interest, and also antiquarian treasures of all dates, from a British cinerary urn found at New Buckenham, by Mr. Colman's grandfather, to a Jacobean buffet. So long a stay was made in Messrs. Tillett and Colman's grounds and houses, that the proposed visits to old houses, churches, and conventual remains in King-street had to be struck out of the programme, except by a few of the more energetic members.

WEDNESDAY.

The closing day was devoted to a visit to an ideal of a Jacobean hall, but four churches of interest were also inspected during the long carriage drive.

BLICKLING HALL,

the seat of the Marchioness of Lothian, is one of the finest and best-preserved Renaissance manor-houses in England, and the members were unwilling to leave so speedily the hall, with its elaborate carving and plaster-work, its tapestries and manuscripts, and the extensive terraces and gardens. Turning a short corner by the church, the house was seen at the end of a carriage-road bordered by broad lawns, and shut in by accurately-trimmed high walls of privet. The chief façade, the eastern, all of brickwork, is broken up by five semi-octagonal bays rising the whole height with a voluted gable above each; at either extremity it is flanked by an unbuttressed tower rising a stage above the roof, and capped with a so-called Elizabethan lead turret of low ogee form. A wooden clock-tower rises on the left-hand side. The house consists of a double quadrangle, inclosed by a moat which is crossed by a stone bridge. The entrance door is richly decorated, and bears the date 1626. Immediately in front of it are parterres cut in the lawn in geometrical patterns, with terraces and clipped evergreens; while to the south, in contrast to this Italian landscape garden, is another laid out in the free and luxuriant English fashion, with broad lake, and the park and woods in the distance.

The visitors were received in the entrance-hall by the Marchioness of Lothian, who at once invited them into the dining-room, where a *recherché* luncheon was laid out. After enjoying this well-timed hospitality, the guests ascended the grand double staircase, rich in Renaissance low relief carving on the balusters, to the library, a noble apartment, some 120ft. in length, with a magnificent Jacobean ceiling, flatly treated and greatly varied, and with a range of mullioned windows looking down on the lake and park. In this gallery the Rev. Wm. Meyrick read a paper, written by Mr. James Bulwer, the late librarian, descriptive of the hall, and the history of the families who have dwelt in it, the art treasures, manuscripts, and books therein collected. The present house was commenced by Lord Justice Hobart in the reign of James I., and was not completed till 1628. The west front was burnt down in the middle of the last century, and rebuilt about 1769. The ceiling of the library in which they were assembled was executed by the spatula, the artist, an Italian, lying on his back to cut the plaster. With the exception of the shields charged with arms, every panel was different from the rest; the principal ones were occupied by emblematical groups, moulded in very slight relief, illustrative of the Virtues, the Senses, and mythological stories. Among the objects of interest might be mentioned the tapestry, some lace, a cap, ruff, stockings, and a lady's toilette box, which belonged to Anne Boleyn, and some paintings of the Lawrence school, including portraits of Lord and Lady Buckinghamshire, executed by Gainsborough in 1779. In the library were about 10,000 volumes, including some early MSS. and printed books. The visitors then made the tour of the building. On the ground-floor is the spacious dining-hall already mentioned, having a wide fireplace, with hood decorated with coats of arms, and the date 1647, and with a Classical composition in wood above; the walls are panelled, and the ceiling is divided into panels by beams, on which is carved a pattern of intersecting circles. The staircase is very wide, and hung with antlers, armour, and paintings. At the top is the drawing-room, with walls hung with tapestry and with post-Tudor portraits of kings and queens of England, a great open fireplace, and a ceiling differently treated from those already described, being a series of panels divided by scroll work, very like the designs of John Thorpe, and with flat pendants at the intersections. To the left of the staircase is the library, and beyond it a suite of rooms, the most notable being the bedroom of George II., where the modillions and chief lines of the ceiling, cornice, jambs, and lintel of doorway (which are Roman in character) are picked out with gilding on a white ground. The bed is a heavy four-poster one, of the type rendered familiar by those at Hampton Court. The manor-house is admirably maintained, while there are no Gothic features, nor obtrusive reminders of 19th century changes within the building. The day would have scarcely sufficed to properly examine its art contents, but after a two hours' ramble over it the members were obliged to leave for their carriages, the general thanks of the party being tendered to Lady Lothian by Sir F. Boileau.

Blickling, Salle, and Cawston Churches were afterwards visited, and the business of the Congress closed after the return with a public dinner at the Royal Hotel, Norwich, followed by some speeches.

Erratum.—In our last issue the well-known historian of Yarmouth was described as "the late Mr. C. J. Palmer," on p. 180. We are glad to hear that, although too indisposed to attend the meetings of the Congress, Mr. Palmer is still living in Yarmouth.

WITH THE ARCHITECTURAL ASSOCIATION IN SOMERSETSHIRE.

It may be of interest if we briefly conclude our notes made with the annual excursion party of the Architectural Association, who this year visited Somersetshire in the neighbourhood of Wells. Last week we followed the excursionists up to Tuesday night, the 12th inst., so that the visits made during the remainder of the week have yet to be recorded. Starting on Wednesday by half-past eight, the following places comprised the programme:—Priddy, Cheddar, Axbridge, Rodney Stoke, Westbury, and Wookey. Thus it will be seen by those who know the route and its hilly roads that a rather heavy day lay before the tourists, who before leaving headquarters had assembled in front of the western portals of the cathedral for the yearly photographic group. Priddy is not a pretty place; it stands on the high pasture lands of the Mendip range to the west of Wells, where the several fields are divided by harshly crude fences of rough stone piled up without mortar, similar to the walls common in Derbyshire. The cottages at Priddy, as well as the church, accord with the desolate character of the natural surroundings, while the interior of the sacred edifice is even more barren and desolate than the exterior. It has, however, not always been so, for amidst the dirt and mildew of neglect now reigning supreme, much remains of architectural interest and merit making the church well deserving of a visit. The original roof of the nave, of 14th century date, remains with its interesting corbels in the walls, and a good stone pulpit still exists in the south side of the nave. The Perpendicular screen is *in situ* with the returns of stalls on its eastern side, and a good early stoup is to be seen in an unusually perfect condition in the south porch, outside of which is a stone bench table extending round the south aisle. A Jacobean altar table is used in the chancel, and an oak chest of similar date will be found in the vestry. We never remember having seen a church still in use in a more utterly dirty, that is to say filthy, condition; it would disgrace any diocese, and should never have been suffered to come to such a sad state, especially when its proximity to the cathedral is considered. However, Mr. Ferrey, the architect, has, we understand, reported upon the church, so that we hope soon to hear of its restoration. The rocks and caves of Cheddar, the admiration of all who visit them, were thoroughly appreciated by the associationists, who lingered as long as time would permit to enjoy the wondrous beauty of the scene, with its towering precipices of mountain limestone, at the foot of which crystal clear water rushes in a torrent. Cheddar church is possessed of a fine western tower, similar to many others of the larger type found in the county, though in this case the angle buttresses are very weak and poor, though the complete character of the church, which is chiefly of the Perpendicular period, at once arrests the attention of the visitor. The centre light to the belfry stage of the tower is pierced, adding greatly to the effect, though such a treatment is unusual in similar examples throughout the neighbourhood. The chapel on the south side of the church is interesting with its figure-carvings, and so are the windows of old glass and the complete and beautiful nave pewing, which is coeval with the style of the church. Mr. Wm. Butterfield has restored the building in a most careful and proper manner, though all will perhaps not agree with the so-called revival of the old decorations, the authority for which others have ventured to doubt. The nave roof certainly suffers rather from the new and crude colouring, but it may be that this is unfinished. The Market Cross is but a fragment, apparently, of what it once was, and is unrestored. Axbridge, on the River Axe, was next visited. It is a quaint ancient little town, still possessed of a corporation, and holding charters renewed by different kings from Edward the Confessor to James I. The church of Axbridge stands exceedingly well with regard to the market place, being situated on the high ground to the right on entering the place from the east. It is reached by a long series of steps, which greatly add to the effect of its elevation. The tower is a fine specimen, if less elaborate than some before described, and the south porch has a curved coping and rich parapet, similar in some respects to Mells, already alluded to. Few churches have suffered more than this from the hands of Puritan fanaticism and neglect; but fortunately the building is now being restored by Mr. John D. Sedding, architect, who already has restored the nave in a thoroughly satisfactory way, new tracery to the windows and new pews being introduced throughout. The latter would, to our minds, have been better if the traceried enrichments to the bench ends had been more deeply cut—3-16ths of an inch more would have made all the difference to their richness, without being perhaps so deeply cut as those, say, at Cheddar. The chancel greatly needs renovating, and we are glad to hear that the work is about to be proceeded with. Several picturesque old houses remain in market place, at Axbridge. The return journey was commenced now, and Rodney-Stoke was soon reached. Here we can only remark that the building has many points of interest, and has just been satisfactorily restored by Messrs. Ferrey and Son, the reopening taking place the day after our visit. Westbury church, the next place visited, sadly wants a similar treatment, when no doubt some good original roofs would be discovered. Wookey was the following place for a halt; it is some distance to the south of Wookey Hole, the legendary haunt of the witch of Wookey, where

> "Deep in the dreaming dismal cell,
> Which seem'd and was ycleped hell,
> This blear-eyed hag did hide."

The church, with its fine tower and angle turret and spirelet, is of interest, but the body of the building seems very over-restored. Mellifont Abbey, adjoining the church yard, was built in 1730; it is what we may call a modern antique, and presents some few fragments of the old rectory house. The Court, now a farmhouse, is not of much architectural value, though once the manorial residence of the bishops of Bath and Wells.

The excursion of Thursday was certainly of more interest, from an architectural point of view, than that just described, and included Pilton, Pylle, Ditcheat, Wyke-champflower, Bruton, and Evercreech. At Pilton, beyond the important and well-situated church, the barn built by the abbots of Glastonbury still remains in good condition. It is illustrated in "Parker's Domestic Antiquities," vol. ii., and is a singularly rich example very similar to the Glastonbury barn, having the emblems of the Four Evangelists under the gable lights, with carved finials to the gables and good buttresses on every side. Those to the transepts are reversed, and strike us as being very unusal. Pilton church has been so thoroughly scraped and renovated that it would be difficult to determine how much is old or new. The chancel with the rich panels in its arch has two tiers of windows of Perpendicular date, similar to the chancel of Ditcheat. The fine Tudor roofs of the nave and aisles have been more carefully restored, but the splendid screen to the chantry chapel on the north side of the nave has been sadly hacked about to accommodate an organ. The original green and gold decorations remain in parts, and in others the colouring has been copied. An old cope covers the reading pew. Pylle church was but very hastily visited, being of very secondary interest, and, like the last-named building, has been elaborately restored. Ditcheat is altogether a more important place, and well repaid the visitors for the extra half-hour devoted to it. The manor-house adjoining the churchyard is a plain example, but was at once sketched by more than half the members of the excursion party. The woodwork inside is not of much interest, and, for one thing, it is begrimed with treacly varnish, which greatly destroys its effect. The house was originally the abbot's mansion, and afterwards belonged to Sir Ralph Hopton, a cavalier of Charles the First's time. The church is cruciform, and is chiefly Perpendicular, but has a Decorated chancel, the fine lower tier of windows being of this date. The curious post-Reformation woodwork, including pulpit, screen and stalls, dated 1630, deserve mention, and so does the quaint cube sundial on the picturesque Tudor-finished porch on the south side. The churchyard cross is perhaps the best seen during the week.

Lunch was had at Wyke-champflower, where the church seems to have been originally simply a private chapel to the old but altered house adjoining. It stands in the private grounds, and is possessed of but little interest. Bruton—so named from the shallow stream, the Brue, which rises in the neighbourhood—is a prettily-placed little town, and was reached by the excursion party by three o'clock. The town itself has several points of minor interest, such as the unusually large series of elaborately wrought iron signs to the several inns, that to the "Old Ball" being particularly rich and large. The hospital, founded by Hugh Sexey in 1617, presents a very good example of Late Domestic Gothic, with its small quad, including a hall and chapel. The simple and unaffected way in which it was designed at once offered many suggestions, and was much admired by several of the architects who visited it on the occasion under notice. The church of Bruton deserves a longer space than we can here spare, but an illustration of the tower figures in the "Somersetshire Archæological Proceedings," 1852, page 16. Suffice it to say that the importance of the western tower is greatly increased by the smaller tower over the southern entrance porch. The building was restored by Mr. Herbert Carpenter, at a cost of about £5,000, in 1874, when the north arcade was taken down and entirely rebuilt. The splendid roof to the nave has a rather scarce treatment in the traceried ribs over the tie-beams. The clerestory windows have beautiful niches between them, with excellently carved but quite modern angels introduced throughout. The crypt under the chancel is Transitional Norman, but the chancel itself is a good specimen of florid Georgian, in plaster. The screen at the west end bears the date of 1620, and seems to have portions of the original Perpendicular chancel screen worked up into it. The pulpit and pew ends are Jacobean, to match which the new seating has been made from the same design.

After devoting more than an hour and a half to Bruton, the associationists visited Evercreech, where the western tower is 130ft. high, resembling the more beautiful one at Wrington, which is the third type of the Somersetshire towers, the others being Taunton and Bristol. And it may here be said that the third class is immeasurably superior to either of the others, both from an ideal as well as an actual point of view. Both Wrington and Evercreech Towers are illustrated in Wick's "Spires and Towers," but we think justice is scarcely done there to the last-named example; this is, however, chiefly the case in points of detail, as in general outline it agrees with our photograph recently taken. Some of the most quaint and curious examples of gargoyles to be met with exist in the parapet cornice of both aisles, and display great spirit and drawing. Friday, the 15th, was devoted to an excursion to Glastonbury, where five hours were spent in examining the abbey remains, abbot's kitchen and barn, and in sketching them, together with the old George Inn and Abbey Court-house, known as the Tribunal. Mr. Parker says, "the town is a perfect store of domestic antiquities;" while Mr. Freeman considers the tower of St. John the Baptist to be the third finest in Somersetshire, surpassed only by Wrington and St. Cuthbert's at Wells. It is illustrated by a fine view in Wick's book above referred to, together with the last-named church. The history of Glastonbury is so well-known, and its architectural remains have been so often described, that we will pass on to Meare, which was included in the day's trip. It lies some three miles north-west of Glastonbury, and amply repays a visit. It was once islanded by a mere or lake, whence the name.

There was formerly a residence here of the Abbot of Glastonbury. It was built by Adam do Sodbury, about 1350, and bears witness now to its former grandeur, though occupied at present as a farmhouse. The splendid windows of the large hall on the upper floor remain, with the interesting stone hooded chimney fireplace. The "Fish House," too, remains as an example of Domestic work—indeed, it is quite an architectural curiosity, and, correctly speaking, is a cottage of the time of Edward III. It has a traceried window at the east end, and was probably used as a residence by the abbey fishermen. The open timbered roof is covered with thatch, and the building now seems to be used as a shed. The church has been restored in a not quite satisfactory manner: for one thing, the easternmost bay of the chancel roof is plastered into a sort of vault to receive some sky-blue tinting, with golden stars, such as "very Gothic" architects considered the proper sort of thing during the early days of the Mediæval revival. The nave is of poor Perpendicular character, but is possessed of a rich stone pulpit on the south side: the old hour-glass has gone, though Murray still records it as in existence. A curious old alms-box remains in the vestry. On reaching Wells, the final dinner took place, after which the usual toasts were drunk, including the health to the president of the year, Mr. S. Flint Clarkson, Mr. James Fowler, the leader of the excursion, and Mr. R. C. Pink, of Winchester, the excursion hon. sec., to whom, in conjunction with Mr. Clark, the well-known antiquary and architectural artist of Wells, the success of the excursion this year to Somersetshire has been so largely due. It is proposed to visit Shropshire next year, with Shrewsbury as headquarters, though Mr. Penrose, of St. Paul's Cathedral, suggested Norfolk, and Mr. Drew, of Dublin, a visit to Ireland. The actual programme will, of course, be determined upon in due course, in the usual way. On Saturday the remaining buildings in the City of Wells, not yet visited, were gone over by the excursionists, and included St. Cuthbert's Church, Babwith's Almhouses, the Deanery, and the Vicar's Close. Mr. Ewan Christian is now restoring the tower of St. Cuthbert's, the body of the church having been renovated some years ago by a local architect. The Vicar's Close is an almost unique specimen of rich Domestic Gothic, ranging from 1348 to Henry VIII.'s time, when Richard Pomeroy added the east end of the hall over the gateway, with its bay windows and reader's pulpit over the mantelpiece, a most charming example of unaffected design. The close provided 21 dwellings for the vicars choral, with a library and chapel at the north end. This latter building is of exceptional merit. Some of the houses have been much altered to permit of a family being accommodated where, of course, one individual was originally only intended to reside. The character and intention of the place has thus suffered greatly, but we should be sorry to see all the houses restored like the two or three already subjected to that process under the direction of Mr. Parker. As it is, they have a quaintness all their own, which would be lost at once if all were made new, to say nothing of the historical page they now furnish in the history of the institution, dark though that page may be. We quite agree in other respects with Mr. Freeman in his remarks upon these buildings and their uses. Mr. Wm. Burges has redecorated one of the houses adjoining the Chain Gate in his characteristic and, perhaps, heavily crude manner. In conclusion, we have only to say in one word that the Architectural Association excursion this year has been a thorough success, to which the exceptionally fine weather added not the least important element.

M. B. A.

CHIPS.

Efforts are being made to obtain sufficient funds to build a mission church and schoolroom at Fishersgate, Southwick. Plans have been prepared by Mr. Arthur Loader, architect, of Brighton and Shoreham, which have been approved by the Lord Bishop of the Diocese and the Ven. Archdeacon Haunah.

The laying of the foundation stone of the new Eddystone Lighthouse, a building the erection of which is due to the decay of the rock on which Smeaton's celebrated structure now stands, was successfully accomplished on Tuesday by the Duke of Edinburgh.

The way to convert modern pottery into the antique, says the *English Mechanic*, is to boil the former in oil and bury it in wood ashes. One will be astonished to find how quickly the new article will become in appearance a veritable antique.

Building Intelligence.

Beaumaris.—The new schools erected by the Beaumaris School Board were opened on Monday. The buildings consist of three departments—boys, girls, and infants, 40ft. by 20, with classrooms 19ft. by 18. The infants' schoolroom in the centre of the building is 41ft. by 24ft. The total accommodation is for 320 children. The tower in the original plan has been omitted in execution on account of the additional cost. The walls are built of Penmon stone, random rubble work pointed with cement, the dressings of windows, doors, quoins, chimneys, &c., being Storton stones. Attached to the schools is a master's residence. Ornamental hinges and latches of doors, &c., were supplied by Messrs. Jones and Willis, Birmingham. The grates are Shillito and Shorland's Manchester school grate. All the desks and fittings were supplied by Messrs. Colman and Glendenning, of Norwich. The total cost of schools, house, boundary walls, &c., and fittings was £3,300. The works were carried out by Messrs. W. Jones and J. Owen, contractors, Beaumaris, the clerk of works being Mr. Evan Thomas, borough surveyor, Beaumaris. The whole of the works were designed and carried out under the superintendence of Mr. R. G. Thomas, Menai Bridge, architect to the school board.

Burslem.—A new market at Burslem was opened last week. The Market Hall, the memorial stone of which was laid in March, 1878, is built of brick and stone, having a frontage of 125 feet, with six lock-up shops and eight offices. The interior area is 125 feet in depth, 100 feet in width, and 50 feet in height. The roof is held by five wrought-iron principals, 86 feet span, resting on cast-iron columns, strengthened with ornamental spandrels. Two sides of the market are fitted up as shops, nineteen in number, and the open space will be filled with stalls of an improved kind. The building is lighted from the roof by means of Rendle's patent system, and the general appearance of the interior all that can be desired. Mr. Richards, the borough surveyor, and engineer, was the designer, and Messrs. Inskip, of Longton, the builders.

Grange-over-Sands, Lancashire.—A large mansion at Grange-over-Sands, which is now nearly completed, is built in one of the most lovely situations on the shores of Morcambe Bay, North Lancashire; the estate on which it is situated being a very extensive one, and beautifully wooded with well grown trees of the choicest description; from the windows of the principal rooms and the tower the whole extent of Morcambe Bay can be seen, and the principal mountains in the Lake district. The house has been built entirely of limestone obtained from the estate, within 100 yards from the site. The works have been carried out from the designs and under the superintendence of Mr. Eli Cox, architect, Kendal; the contractors for the masons' work were Messrs. D. and J. Toms, Kendal; for joiners and carpenters' work, J. Bervely, of Grange-over-Sands; for plumbing, painting, and plastering, Messrs. Chippendale and Tanner; and the slating, H. Goulding, of Kendal.

Heaton Norris.—The new goods warehouse of the London and North-Western Railway Company, at Heaton Norris, Stockport, is nearly finished. The area contains about 5,662 square yards. The building is 364ft. long. The width at the north end is 162ft. 6in., and at the south 116ft. 7in. or an average of 140ft. It embraces four floors, in addition to a basement. The height of the floors is—Basement, 7ft. 10in.; ground floor, 14ft. 6in.; the height of the three others is 8ft. 6in. each. The roof is of wood, but all the columns and the girders are of iron. The whole work is from the designs of the Railway Company's architect, Mr. James B. Stansby, London, and the contractors have been Messrs. R. Neill and Son. All the ironwork is of English manufacture. The building is of red brick, with blue brick and stone facings, and has cost about £80,000.

Heswall.—The new parish church of Heswall was consecrated last week. It is dedicated to St. Joseph and St. Peter, and has sitting accommodation for 500 persons. It has been built in the Early Decorated style, and the work has been carried out to harmonise with the old tower, which is left standing, and which is supposed to be 500 or 600 years old. The material used in the building of the edifice is a fine red sandstone from the quarry in the neighbourhood. On the north of the gabled aisle there is a nave, and there is also a north aisle. The organ-chamber and the vestry are placed each side of the chancel, as are also the choir pews. Mr. James F. Doyle, of 4, Harrington-street, Liverpool, was the architect; and the contractor Mr. Hugh Yates, of Bute-street, Everton.

Kirkdale.—The memorial stones of a new Wesleyan Methodist chapel were laid on the 14th inst. at Kirkdale, Liverpool. The chapel will be in the Italian style, the walls being faced with Ruabon bricks, tuck pointed, the dressings being of local stone. The building is arranged on a transeptal plan, the body being 70 feet by 50 feet inside, and the width across the transept 64 feet 6 inches. There will be a minister's vestry, a band-room, an orchestra, and four class-rooms, with a separate staircase, and a heating vault in the basement. The front of the building is broken with central gable having a triple arcade, containing lights, and ornamented with scroll panels in form of a balcony. There are porches flanking this centre, and in the main angle is a tower, 12 feet square, rising to the height of 84 feet, and finished with a domical covering in lead. The building will accommodate 1,100 worshippers, and the cost of the whole, including boundary walls, will be about £4,600. The designs have been prepared by Messrs. William Waddington and Son, of Burnley. The contractor is Mr. Samuel Webster, of Bootle.

Newcastle-on-Tyne.—The corner stone of a new Jewish synagogue was laid last week at Newcastle-on-Tyne. The style adopted is free Byzantine. The elevation in Albion-street is more than 80 feet long, and has six piers in the length. The basement is carried down throughout the whole area of the building, and contains boys' and girls' schools, committee-room, bath-room, waiting-room, &c. The synagogue is about 60 feet long from front to back, by 50 feet wide, and 43 feet high from floor to top of circular ceiling. The ground floor will contain sittings for between 300 and 400, and the gallery between 200 and 300. The recess which is intended for the ark is enriched with angle columns; ornamental arches and ribs support the wall above, surmounted by enriched panellings and a deep cornice continued round the whole synagogue. The roof is constructed with laminated ribs for strength and to form ornamental portion of ceiling. Thorough ventilation is gained by horizontal chambers running the whole length of the building, rising and converging towards two large Boyle's ventilators. The whole of the contract has been undertaken and is being carried out by Messrs. T. and R. Lamb, of Gateshead, and Mr. John Johnstone, of Clayton-street West, Newcastle, is the architect.

Rodney Stoke.—On August 14 the ancient church of St. Leonard, at Rodney Stoke, which has just undergone restoration, was reopened for public worship. The building is chiefly in the Perpendicular style. In addition to restoration, the building has received an addition in the shape of a south chancel aisle. The chancel has been repaved with encaustic tiles from Godwin, of Lugwardine, arranged from the architect's designs, and new oak-stalls and prayer-desks and lectern have been fitted. All the monuments have been conservatively repaired by Mr. Louis Jaquet, sculptor, of London, under the superintendence of the architects. The Jacobean pulpit has been refixed after repairing on a new Ham Hill stone base, with Keinton stone steps. The old font has also been repaired and refixed. The architects are Messrs. Benjamin and E. B. Ferrey, of London; and the builder is Mr. H. Hawkins, of Glastonbury. The total expenditure has been about £850, exclusive of the cost of the restoration of the monuments and fabric of Rodney chapel.

Smethwick.—On Monday last, the new Board Schools, which have been erected in Corbett and Ballott-street, Smethwick, were opened for the reception of scholars. The schools are built on a plot of land bounded on the one side by Corbett-street, and on the other by Ballott-street, and containing in the whole 4,840 square yards. The buildings are constructed in the Gothic style of architecture, with red bricks and stone window-sills, &c. The arches to the window and door openings are of rubbed and gauged bricks, and terra-cotta has been introduced for label mouldings, strings, and ornamental dressings to the window-heads and gables. The schools are built in two blocks, the first block being used for the boys and girls, and the second block for the infants. The boys' and girls' schools consist each of a principal room, 66ft. long, and 22ft. wide, and two class-rooms 20ft. square. The infants' school is 55ft 6in. long, and 26ft. wide, with a wing 25ft. 6in. long, and 10ft. wide; also a class-room 26ft. by 18ft., and a babies' room 22ft. by 15ft. The roofs are covered with brown tiles, and have wrought-stained and varnished principals exposed to view, and ceiled at the collar beams. The rooms are ventilated by means of a ventilating shaft continued throughout the buildings, and connected with a tower on the south-east angle. Each school is provided with a lavatory and cloak-room, covered playshed, and necessary offices. There is a residence for the master and mistress, and the buildings have been so arranged that two additional class-rooms can easily be added when required. The entrance to the boys' school is in Ballott-street, and to the girls' and infants' in Corbett-street. The buildings have been erected from the designs and under the superintendence of the architects to the Board, Messrs. Sharp, of Cherry-street, Birmingham, by Mr. J. Hartley, builder, of Small Heath, and will accommodate 726 children.

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Correspondence.

PRINCE CONSORT'S MEMORIAL, HYDE PARK.

To the Editor of the Building News.

Sir,—My attention having been called to several notices respecting the alleged decay of the stone in the above memorial, I have taken an opportunity of thoroughly examining the same.

I found the whole of the work in a good state of preservation; therefore, in my estimation, it would be a pity to coat the stone and marble with any wash or silicated solution.

If a commission is appointed to examine and report thereon, I would suggest that some thoroughly practical men conversant with stone should be placed on the commission, otherwise a national monument may possibly become a national reproach.

Many of the so-called stone preservatives merely arrest decay, as paint does decay in wood; and when the paint or coating is worn away, the ravages are frequently found to be worse than before.

During the building of the Memorial I made numerous visits thereto. I can therefore bear testimony to the great care that was taken to place every stone on its true, or natural, bed. I do not think at present any coating would be advisable.—I am, &c.,

Samuel Trickett.

NOVEL COMPETITIONS.

Sir,—The somewhat unusual invitation issued by a suburban clergyman appears to have produced several letters of peculiar character, and anything but creditable to their authors. I have no doubt but that the competition for the Mission Church will be fairly conducted; but all competitors may not be aware of the fact that the vicar of St. Paul's, Herne-hill, is the father of a clever architect (Mr. W. H. Powell, of Mecklenburgh-square).

The Barnsley Guardians, having invited architects to offer to compete for the new Infirmary, at the same time stating terms, received 44 applications, and at a meeting held recently, the offer of Messrs. Dixon and Moxon, of Barnsley, was accepted, the commission to be 2¾ per cent. to include all drawings, &c., superintendence and *bills of quantities*. Both members of the firm are, I am informed, young men, and will probably some day know better. I need not add that neither partner is a member of the Royal Institute of British Architects.—I am, &c.,

Observer.

GLOUCESTER ASYLUM COMPETITION.

Sir,—In an important competition of this character, it would have been satisfactory no doubt to the majority of the competitors if the Visiting Justices had been assisted in selecting the designs by a disinterested architect and an experienced medical superintendent.

Of course, we naturally think the design submitted by us, "Utilitas," ought to have been placed first, not only on our opinion of its merits, but on the impartial judgment expressed in your review of the designs, and also that of your contemporaries. When commencing to work out the plan, we inferred that light, air, cheerfulness, convenience, and sanitation would guide the choice of the Visiting Justices, but we fear such important elements have not been duly considered.

We have no desire to point out any faults in the plans of the successful competitors, and at the same time we respectfully submit to the decision of the Vising Justices.—We are, &c.,

Bromilow and Cheers.

21, Harrington-street, Liverpool, August 30th.

FARM PLANS AT KILBURN.

Sir,—A correspondent asks if the "R.A.S." could not be prevailed upon to allow these plans to be exhibited in one or other of the county towns in the great farming districts. Allow me to say that the plans have been returned to their owners, the majority of whom would, however, only be too glad if some influential society would arrange to re-exhibit them, and appoint thoroughly practical and capable judges to affirm or disprove the assertion that "none combine superior arrangement of detail with economy of cost"—and which statement was the result of an average of fifteen minutes' examination of each set of plans, inclusive of specifications and detail estimates. But your correspondent's suggestion is beset with difficulties.—I am, &c.,

P.

W.C.'S IN BATH-ROOMS.

Sir,—Notwithstanding Messrs. Keeu and Son's assertion that it is quite possible to fit up trapless w.c.'s so that they will be as sweet as the waste water from the bath, being perfectly true, I cannot help thinking that the practice of associating the bath and w.c. in one room is very objectionable. If experienced sanitary engineers were always employed to fit them up, there would be no danger of sewer gas contamination, but unfortunately this is not the case, as often a house owner having seen a bath-room well fitted up in some friend's house, gets some local plumber to make him one according to his description, and the bath waste-pipe untrapped is led into the w.c. soil-pipe and admission to sewer-gas into the house to poison the inmates at once effected. It is true that in many towns the building by-laws specially provide that the waste-pipe from every sink, bath, or lavatory, shall not be led direct into the drain, but shall discharge into the open air over a channel leading into a trapped gulley grating.

Where this is laid down and carried out undoubtedly sewer-gas is effectually excluded; but there are only too many houses in towns built before these building by-laws came into operation, in which the waste-pipes lead direct into the drains, and to most of the large country mansions where baths and water-closets are being put in together into one room, these building by-laws do not apply, and sometimes either from ignorance or carelessless on the part of the plumber, the bath waste-pipe is led into the water-closet soil-pipe.

But there is another danger in fitting the w.c. lavatory and bath in the same room, even when done by experienced plumbers, and that is that the trap of the bath or lavatory may become stopped up, and a local plumber called in to put it right, who may very likely cut off the trap, and lead the pipe direct into the drain. This might be said to argue more than ordinary stupidity, but that such a case can occur I can speak from experience, having been called in some time since to inspect a house where the doctor felt sure from the symptoms of the patients he was attending that there was an escape of sewer-gas. I found that the waste-pipe from the sink led direct into the drain, and was told on inquiring by the lady of the house, that "there was a stupid bend in the pipe formerly which was always getting choked up, but that the plumber they had called in some time previously to clear it, had cut it off, and put in a straight pipe instead, so as to prevent its being choked again."

If householders were only thoroughly aware what risks they ran from untrapped sinks, and waste-pipes from baths and save-alls under cocks, I feel sure that not a few would save doctor's bills in future by at once having their houses thoroughly examined, for even where the waste and overflow pipes are properly trapped, there is always a danger of the traps being unsiphoned if they lead into the soil-pipes, by the rush of water from some closet, lavatory, or other bath, or of the water in the overflow evaporating in hot weather, and an opening being thus formed for the entrance of that breeder of diphtheria and typhoid fever "sewer-gas."—I am, &c.,

A. Sedgwick Woolley, Sanitary Engineer.
Kingston-hill-on-Thames, August 14.

DEFILED BATH-ROOMS.

Sir,—We are of opinion that if Mr. Buchan had read the letter of your correspondent of the 1st of August, that called forth our letter of the 8th, he would not have written in the strain he has assumed in your paper of the 15th.

We merely took the ground that because the w.c. was fitted in the bath-room it need not necessarily be a *cell*, or in *communication* with the sewer, as your first correspondent thinks.

We take no extra credit to ourselves for bringing anything *new* forward, neither have we any patent to *hide under a bushel* until the forthcoming Sanitary Congress; but it is surprising how much prejudice there is against trapless w.c.'s and open soil-pipes, both in the business and among the uninitiated.

When we said a *common* w.c., we meant a pan-closet or a common servants' hopper; and any closet not such need not be an *uncommon* one, as Mr. Buchan thinks.

We say, do away with all traps in the house, but especially with the vile D-trap (we have just taken one out of a nobleman's house with nearly 3" of solid matter in it), and fix the closet to an open pipe, and your closet is bound to be clean and sweet.

We propose to fit up at the forthcoming Sanitary Congress one of Jennings' trapless w.c.'s in connection with an open soil-pipe, having at its foot one of the Brown accessible Y traps, which from experience we have found to be superior to any we have used, keeping the trap as near the surface of ground as possible.

We have fitted up a great many in Croydon and vicinity as above, and have found them give much satisfaction, though we think any trapless closet, with a plug to retain sufficient water to flush the soil away, will answer as well.

We also find a 3" soil-pipe keeps cleaner than a 4" or 4½", as the *scour* is so much more perfect, and never chokes up.

Trusting the above will cause more plumbers to try this system is our apology for trespassing at this length.—We are, &c.,

Keen & Son, Sanitary Plumbers.
Croydon, August 16.

Intercommunication.

QUESTIONS.

[5869.]—**Saw-Dust in Plastering.**—I have seen in the Building News one or two references as to the use of saw-dust in plastering. I should be glad if any of your readers who have experimented would favour us with their experience.—R.

[5870.]—**Domes.**—Will some one kindly give me a table or formula for finding the thickness of the walls of domes? The one specially in question is 35ft. in diameter and 26ft. high, exclusive of lantern. Any hints as to chain bond, &c., will also oblige.—X. Y. Z.

[5871.]—**Finial.**—A country church has lately been built, the drawing for finial on spire being chosen by architect and clergyman from a manufacturer's pattern book and duly ordered by builder. When finial arrived on ground clergyman showed foreman that the construction was defective, the end of rod from vane sitting in a cup, which would shortly catch rust. Foreman, however, fixed finial, and at architect's next visit all scaffolding was down. Cock shortly did get jammed, and, adding insult to injury, in a rather "low" parish looks resolutely to the east. Clergyman refuses to pay final instalment to builder until vane is made right, which would involve rescaffolding spire, &c. Builder says he ordered finial as directed, and is not responsible for reprehensible behaviour of cock. If any reader has had any similar case, a hint as to what is best to be done would oblige.—X.

[5872.]—**Shakespearian Quotation.**—I have just finished an hotel and tavern in domestic architecture, having a string-course all round the building (about 80ft. in length) 6in. deep, which I intended for the landlord for his name and business designation in encaustic tiles. I have since altered my mind, and would prefer some trite quotation from Shakespeare or other author, being upon the question of the use and not abuse of good liquor. —Upton Park.

[5873.]—**Cement.**—Having some houses (speculating built) with partly stuccoed fronts to repair, I should be glad if some reader having practical experience in the matter would tell me what is the best way of dealing with the stucco, which is of Roman cement and painted. My own opinion is that it ought not to be painted but washed over with cement and oil, or something of that kind. If so, what are the best ingredients, and in what proportions should they be mixed, and what is the best way of getting the old paint off? What is the best and most durable way of finishing Portland cement stucco? I should also like to know whether 1in. of cement is too great a thickness for finishing inside paving on concrete, and whether there is any disadvantage in mixing it 1 part Portland cement to 1 part sand, as having specified this I have been told that it is better to make the floating coat ¾in. gauged 2 and 1 and set with ¼in. neat cement.—Young Architect.

REPLIES.

[5860.]—**Painting on Glass.**—In the series of books published by Weale, at prices from one to three shillings, there are two on this subject.—G. M.

[5864.]—**Partitions.**—I refer "G. P. B., Dublin," to an article on this subject, which appeared in the Building News lately, by which he will see that light hollow earthenware or pipes may be used to fill in the timbers if concrete is too heavy. A kind of "pugging" made of chopped hay and mortar is sometimes used, and is an excellent sound destroyer.—G. H.

[5867.]—**Water Colour Painting.** — There is a shilling guide sold by Winsor and Newton, the artist's colourmen, and a very useful guide is also published by Messrs. Rowney which give all that is essential to be known in the way of instructions; but as a student myself who has had some little experience in water-colour drawing, I would recommend "A Dummy" to take a few lessons—one might be sufficient—by which he would learn in one hour how to lay on the local and other tints. He might then follow the instructions given in the guides with advantage and with some confidence. The technicalities of painting, though easily learnt by the aid of a master, are too great to be mastered by the self-taught artist, who must need waste half his time in puzzling out for himself what a master could tell him in one lesson. The self-taught student is under this great disadvantage. —G. H. G.

[5867.]—**Water Colour Painting.**—I would advise "Dummy" to obtain "A System of Water Colour Painting," by Aaron Penley, published by Winsor and Newton, 38, Rathbone-place, London, at one shilling. He may also get "Sketching from Nature in Water Colours," by the same author, with illustrations in chromo-lithography, 15s., published by Cassell, Petter, and Galpin, London, who also publish "A Course of Sepia Painting," and "A Course of Painting in Neutral Tint," each five shillings, with plates.—G. M.

CHIPS.

The parish church of St. Peter, Peterchurch, has just been restored at a cost of £575, under the care of Mr. T. E. Williams, architect, of Victoria-street, S.W. Mr. Thomas Duggan, of Moreton Jeffries, was the contractor.

The memorial-stones of a new Wesleyan chapel at Comberbach were laid last week. The design is by Mr. Ford, architect, Burslem, and the contractor is Mr. Robert Fairhurst, builder, Whitley; the masonry being provided and executed by Messrs. G. and R. Rathbone, of Northwich. The style is Gothic. The building will be composed of bricks, with stone dressings. Accommodation will be provided for about 220 worshippers, and the schoolroom will hold about 150 children.

Messrs. Macnaught, Robertson, and Co., of Bankend, Southwark, are supplying the cast-iron columns for the new sheep market at Deptford.

Our Office Table.

The members of the Glasgow Architectural Association visited Paisley Abbey on Saturday last. They were conducted over the building by Mr. Ambrose J. Russell, vice-pres., who pointed out its various peculiarities, and also gave a short account of its history. After some time had been spent a vote of thanks was accorded, which terminated the proceedings.

Some experiments to try the relative economy and illuminating power of gaslight and the electric light were on the 8th instant conducted in the Picton Reading-room, a large new round building with dome between the Brown Library and Museum and the Walker Art Gallery in Liverpool. The gas company had erected an extensive temporary arrangement in order to flood the large apartment with a bright and steady light, and it is estimated that the gas was consumed at the rate of over 2,000 cubic feet an hour, or a cost of 7s. an hour. The method of illuminating by the electric light originally proposed by the engineer of the British Electric Light Company was by reflection, chiefly from the dome, and the arrangement adopted on Friday of placing the light on a centre pedestal (which is the borough engineer's idea) most effectually carried out this method. The result of the Library and Art Committee's inspection was that they determined to adopt the electric light. The electricity was generated from the Gramme machines, driven by the engine which supplies the Steble fountain, but which is not suited for the electric light purposes, and is blamed for the unsteadiness still noticeable. As the electric light on Friday only cost about one-third the price of the gas illumination, the committee see that the economy will soon repay the cost of a suitable engine.

A Baptist school, now being erected at Staincliffe, Batley, from the designs of Mr. Walter Hanstock, A.R.I.B.A., architect, Batley, shows how prices have altered during the last six years. The whole of the works have been let for the sum of £1,331, which includes everything but heating apparatus and part of the varnishing. Pricing the quantities out from schedules of work carried out in 1873, they would have come to about £2,400. As the difference is very great, the architect has been at the trouble of comparing the costs with other schools he has built. The schools tested are purposely selected of a similar character in general arrangement, material, and finish, but much larger than the one illustrated, and they have been built during the last six years. Healey Board School, Batley, cost £3,714; Grammar School, Batley, cost £4,400; Churwell Board School, near Leeds, cost £3,895; Park-road Board School, Batley, cost £8,433; and Warwick-road Board School, Batley, cost £8,352. The superficial measurement of the flooring has been taken throughout of each school, the price per square yard ascertained from the original cost, and the flooring of this school, priced out at the same rate, gives the following result. At the rate of Healey Schools, the cost would be £2,300; at the rate of Batley Grammar School, £2,234; at the rate of Churwell, £2,000; at the rate of Park-road, £2,177; and at the rate of Warrick-road, £2,048. If this school has been built five or six years ago, it would have cost 65 per cent. more than what it has now been let for, as taken from the above figures. The difference is enormous. This is not effected altogether by materials going down, but by the severe depression in the building trades, causing contractors to cut the prices extremely low, and consequently in many cases small or no profits at all are anticipated, but simply to find employment for the men. Taking a few prices of the difference of material may be interesting here also. In 1872 and 1873, cast-iron columns, girders, &c., for mill work, were about 13s. per cwt., they now are 3s. 6d.; and gutters, then 15s. per cwt., are now 5s. Plate-glass was about 5s. per square foot; it is now 2s. 6d. Best Welsh slating 24in. by 12in., at that time got up to to 4s. 6d. per square yard, and this has let for 2s. 3d.

Information has been received from the Pyrenees that in searching the ancient sites of Phocæan and Phœnician settlement Dr. Phené has found a bronze head of the goddess Isis, of rude but expressive workmanship. The horns of the cow are well formed, and surmounting them is the crescent moon, the ears of the cow are pendent and distinct, and with the exception of the face, which is benignant and of human form, the portion of the body exhibited is clothed in the skin of the cow. It appears to have been made for elevation on a staff or standard. Some rude objects found with it indicate a very early date. It is curious that the golden disc on the cow's head discovered by Dr. Schliemann is taken to be indicative of Hera, and in this case the crescent clearly indicates Isis.

Mr. G. G. Hoskins, F.R.I.B.A., of Darlington, has sent us an advance copy of a little book he is just about to publish, entitled, "An Hour with a Sewer Rat," which contains a few plain hints on house drainage and sewer gas. The first part of the book is the best, and will probably open the eyes of a good many of the general public to the wretched blunders which are responsible for so much waste of public money, and the frequent disturbance of our thoroughfares. Like some doctors, drainage contractors seem sometimes to think that once hidden underground their mistakes will be forgotten, or attributed to other causes than their own ignorance, or that of those under whose directions they are working. Members of local boards and town councils who have neither the leisure nor knowledge requisite to read the professional literature of sewerage and drainage should get Mr. Hoskins' little book; they will find just enough in it to enable them to exercise some check upon contractors and others who are not seldom paid three times over for repairing works never properly executed at the first. The second part of the book is a comparison of several well-known sanitary appliances long ago familiar to readers of our correspondence columns, and further reference to which would almost deservedly subject us to the fate of another journal which Mr. Hoskins' rat found washed down into the main sewer.

Wapping.—A new bridge forming the Wapping entrance to the London Docks, has just been commenced, the old one, built some sixty years ago, now found too narrow, having been demolished, and a temporary structure for foot traffic erected, which is now in working order. The new foot bridge consists of a wrought-iron lattice girder of horizontal movement, so as to draw backwards and forwards, and allow entrance of vessels to the docks. The length is about 63ft. over all, and is supplied with the necessary gear and balance weights to allow it to be worked with safety. The new permanent swing bridge will be similar to that over the Hermitage Dock entrance, having a width over all of 24ft. 6in., with a foot path on either side, thus allowing space for two lines of traffic to pass at the same time (instead of one) and avoiding the constant blocks which took place on the old single bridge. The new bridge consists entirely of wrought iron, on a foundation of Portland cement concrete and granite stone, and will be able to bear a test of 2cwt. per foot super., or an equivalent load placed at any point between the bearings, and also a moving load of 32 tons carried on a truck of four wheels. The contractor is Mr. William Webster, who has stipulated to complete the work within a given time. The ironwork will will be erected by Handyside and Co., Limited, of Derby, and is we learn all ready for placing together. The entire work is under the superintendence of Mr. Rowell.

◆

Holloway's Ointment is strongly recommended for those dyspeptics whose natural delicacy of constitution forbids the internal use of much medicine. The unguent rubbed upon the pit of the stomach and right side stimulates the stomach and liver to healthy action, and thus secures easy digestion, proper assimilation and abundant nutrition.

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◆

CHIPS.

A memorial stone of a new U.P. church, at Galashiels, was laid on Saturday. The church is to be built from designs by Messrs. Thornton Shiels and Thomson, Edinburgh, in the Early English style, with area and gallery on three sides, or rather with galleries on all sides, as the choir gallery, with accommodation for sixty singers, is set behind the pulpit. It is to accommodate 760 in all, with session-house, vestry, ladies' room, and large hall for Sabbath-school and other meetings. The total cost will be over £4,000.

Excavations on the estate of the Duke of Devonshire at Barrow-in-Furness have disinterred Roman remains which probably formed part of a consecrated edifice, containing one or more baths, built prior to Furness Abbey. Stone foundations laid on pieces of oak, presumably remains of one of the baths, have been discovered, as well as light pieces of slag (evidencing that smelting had been carried on in the vicinity), some lead ore in a pure state, a mason's pencil, a few bones, and a carved copper key, in a fine state of preservation.

Mr. Creeke, consulting surveyor to the Bournemouth Improvement Commissioners, having claimed £770 for seven years' services, several Commissioners characterised the appointment as a "quasi-sinecure," adding that the office had been given to him out of kindness, and that he was not expected to do anything for his annual salary of £220. It was decided to abolish the office, and Mr. Creeke's claim was referred to a committee.

Mr. Edward Pritchard, C.E., F.G.S., of Warwick and Westminster, has been elected President of the Association of Municipal and Sanitary Engineers and Surveyors. The votes of all the members of the association are taken by ballot papers, and the first return resulted in a tie between Mr. Pritchard and Mr. Deacon, the borough engineer of Liverpool.

◆

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◆

TENDERS.

Acton.—For erecting six houses and forming private roadway, in Gunnersbury-lane, Acton, for Mr. W. T. Thorn. Mr. V. Hunter, architect:—

	Houses.	Roadway.	Total.
Cowland, Bros. ...	£2,492	£49	£2,541
Brown, T. R.... ...	2,390	55	2,445
Blackall, J.	2,078	109	2,187
Waters, W. H. ...	1,768	60	1,828

Bethnal Green.—For the erection of shops and warehouses in Bethnal-green-road, for Messrs. Nicholson and Son. Messrs. Gordon and Lowther, architects:—

Browne and Robinson	£7,846	0	0
Thomas	7,689	0	0
Tully	7,320	0	0
Braid and Co...	7,052	0	0
Thomasson and Son	7,025	0	0
Tarrant and Sons	6,990	0	0
Larter and Son	6,775	0	0
Forrest...	6,995	0	0

Burslem.—For alterations and additions to shop in Nile-street, Burslem, for James Miller, Esq. Mr. Elijah Jones, architect, Hanley and Newcastle. Quantities supplied:—

Cooke	£220	0	0
Brindley	200	0	0
Watkin	198	0	0
Beech	190	0	0
Sutton	186	0	0
Bowden	184	0	0
Grosvenor	160	0	0
Ward	150	0	0
Pritchard...	150	0	0
Bennett (accepted)	135	0	0

Burton Joyce, Notts.—For raising and levelling the ground and erecting boundary wall. Mr. Herbert Walker, architect:—

M'Culloch	£690	0	0
Sills	421	0	0
Bickmore	375	0	0
Cargill, St. J.	292	0	0
Smart, junr. and Co.	289	0	0
Henson	275	0	0
Meats, Bros.	269	0	0
Key (accepted)	260	0	0
Smith and Greaves	256	0	0

Chelmondiston.—For erecting new Wesleyan chapel, school, and offices, at Chelmondiston, Suffolk. Mr. Wm. Eade, architect, Ipswich:—

Welham, J.	£1,275	0	0
Gibbons, E. and E. C.	1,030	0	0
Catchpole, E....	995	0	0
Wyatt, C. A....	952	10	0
Wagstaff, W. (accepted)	890	0	0

Hampstead.—For house in Netherhall-terrace, Hampstead, N.W. Mr. Samuel Knight, architect. Quantities by Mr. G. Fleetwood:—

Adamson and Sons	£3,462	0	0
Pulman and Fotheringham ...	3,450	0	0
Nightingale	3,443	0	0
Roberts, Bros.	3,397	0	0
Longmire and Burge	3,385	0	0
Dove, Bros.	3,328	0	0
Grover, J. (accepted)	3,238	0	0

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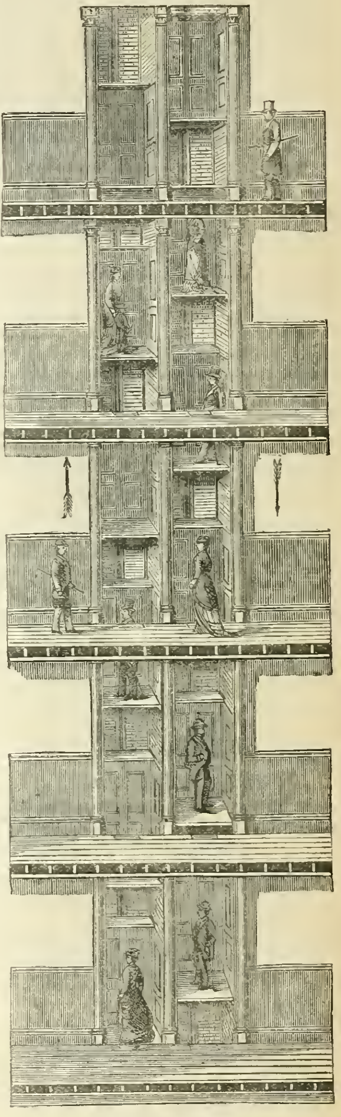

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THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 29, 1879.

THE CATHEDRALS OF METZ AND STRASBURG.

THESE ancient and stately edifices, which became partly ruinous before that of Cologne approached completion, have, ever since the termination of the Franco-German War, been in process of repair. For that of Metz a new roof is determined upon, for which the architects of the two provinces have been invited to compete, while the great gates of the Strasburg edifice are to be regilded by artificers from Paris. It is worthy of remark how many of the most celebrated European cathedrals are at present in a state of decay, more or less irreparable. The arches of Amiens are in danger, and its polychromatic decorations are rapidly vanishing from sight. The spire of Antwerp, even, had lately to be restored, to save it from mouldering to destruction. At Asti, recent restorations have destroyed the beautiful natural colouring of the stones. Saint Bavors, at Ghent, was only rescued from utter dilapidation a few years ago, while that of Troyes has been endangered by the very means employed for its conservation—an iron girdling, which gave way beneath sudden atmospheric changes. It is to be feared, indeed, that many influences exist, throughout Europe, tending to the neglect and disintegration of these historic structures, as witness the state in which are left the bronze doors of Pisa, the pulpit of Raveno, the balustrades of Rouen, and the towers, even, of Tournay, the most antique among the religious monuments of Belgium. Those of Ajaccio, Madrid, Chateauroux, Marseilles, Moulins, and Nantes, are, indeed, scarcely more than so many new buildings erected on old foundations, though claiming to be dated with them. That of Metz, however, which the German Government—arbitrary in matters of architecture, as in all else—has resolved upon re-roofing, possesses a particular interest. The work was originally determined upon, however, by a French Government, simultaneously with that of Beauvais, and the scheme was that of a Frenchman, who exhibited his designs so far back as the year 1852—a plan with two sections, including the choir, stalls, pulpit, high-altar, lamps, and decoration, in stone, wood, and colour generally. Upon this last part of the subject a discussion has been in progress from that time to this, and is not yet terminated, whether the precedents shall be followed of Aix-la-Chapelle, almost stern in its severity; of Alby, almost Pagan in its adornments of pyramids, porches, clock-towers, mosaics, painting, and sculptures; of Amiens, with its brazen-lidded tombs; of Auxerre, enriched with colour down to its very crypts; of Chartres, with its gilded tables, bas-relief in stucco, and stained windows; or of Citta-di-Castello, with its enamelled pavements. Ultimately the resolve was adopted to preserve the original outlines and style, so far as they were known; and the German desire is, it may be said, to act upon the suggestions of the French architect. As for Strasburg, it would be an act, so to speak, of artistic impiety to depart from them. On the principal door are inscribed these simple yet impressive words, "In the year of Our Lord 1277, on the Feast of Saint Urbain, Master Erwin, of Steinbach, commenced this glorious work." Erwin died A.D. 1318, his son John continued his labours after him for a period of twenty years, then the task was taken up by John Hulz, of Cologne, who died A.D. 1449, nearly a century and a quarter after the laying of the foundation stone. All three belonged to the plebeian order, yet the noble chapter of Strasburg raised their monuments in the cathedral—an honourable custom of the age, not there exemplified alone. The three architects of Amiens are magnificently commemorated beneath its roof, though the history of their memorial is a curious one. Jean de Chelles is not forgotten in Notre Dame de Paris. At Toulouse the names are preserved of the artisan monks—"rectors of works" they were termed—who assisted in its building, and in the metropolitan church of Chartres are the tombs of its chief architects, Robert de Courcy and St. Ignaise. But at the general conference held upon this question at Paris, nearly forty years ago, the report of an architectural committee was submitted, the recommendations of which were: that the original outlines of the apse should be retained; that the Roman-Byzantine should be preferred before any purely modern adaptations; that the altar then existing—a marble slab, supported upon four dwarf columns—should be replaced by an altar of Oriental, or Byzantine form; and that the stalls in the choir should be replaced by others of "a fashion less burlesque," with an episcopal chair "copied from the basilicas of Italy." Moreover, the apsidal arch was to be painted in fresco on a gold ground, while the cupola was to be similarly adorned, with groups of the Evangelists, and their respective attributes symbolised. These conclusions were not adopted in their entirety, because some peculiar theories of architecture prevailed at the Strasburg Congress. Some of its members repudiated the Byzantine idea altogether, and pleaded for the style in vogue when the fifteenth Louis of France was king. Others thought that every Christian order of art should be represented in a Christian edifice; a few insisted on the Gothic, and everyone is now aware of what the result has been. In relation to Strasburg Cathedral, however, the works now going on with respect to its renowned astronomical clock are curious. In one way or another the machinery got out of order several years ago, and not a few mechanicians of repute felt reluctant to meddle with it. The first of these constructions was accomplished in 1352; two centuries later an attempt was made, as most people thought with small success, to improve on the original model, and the experiments have not ceased to this day. A history of this marvellous clock, however, would require to be written by itself.

The progress of all these cathedral restorations, whether undertaken by the French or the Germans, has been singularly slow. Thus, the Chapel of the Nativity, though commenced more than 30 years since, is not thoroughly completed yet. No doubt it is an exceedingly intricate and beautiful work, involving a more elaborate employment of colour and gilding, which had frequently to be suspended through the severity of the weather for weeks, sometimes altogether, and, indeed, many external causes have delayed the artists at their labours. As at Cologne, in fact, generations of them have passed away since the undertaking was begun. Of course, if we choose to be antiquarian, we can go back to the age of Clovis, to the days when ten thousand workmen assisted, free of wage, in the erection of this mighty shrine, simply "for the good of their souls," and so forth; but it is the structure, under its latest aspects, that has to be considered. The equestrian statues of Pepin the Little, Charlemagne, Otho the Great, and Henry the Fowler, are comparatively new. So is the gigantic group, in sculpture, of the Last Judgment, with a part of the spire, which attains to a height not much more than two yards less than that of the Great Pyramid, which, as is well known, is the loftiest structure in the world. Such edifices, it may almost be said, are never complete. Every generation adds to them, and every generation, also, has to repair more or less of their decay. That of Barcelona, for instance, ancient though it be, has still one of its porches unfinished. That of Isaac, at Moscow, is even now swelling its proportions. That of Clermont only received its high-altar, covered with plates of beaten gold, so lately as the year 1855; that of Lausanne was quite recently re-paved with asphalte; only the other day, as it were, a municipal vote was passed to facilitate the progress of the noblest cathedral in the South of France; and it yet remains a problem of nineteenth-century architecture whether or not the towers of Notre Dame shall spring into pinnacles, and thus transform, as it were, the horizon of Paris. To true Parisian archæologists, this notion appears hardly less profane than the projected coating with stone of the beautiful brick towers at Alby, the modernising of the architectural relics at Carcassonne, the paganising of the great Knocker at Durham, or tearing away its copper coverings from the Laçon cross. Transformations of the kind, as architects are well aware, are going on, all over Christendom—new friezes along the aisles of Chartres; new windows and woodwork at Evreux; a painted iron grille at Fribourg; decorations in lava-stone at Palermo; freshly-designed gurgoyles for the great Catholic Church of Paris—the stones of which, for the future, are to be silicatised; and, at Perpignan, new walls to sustain an old roof. Amid all these cathedral patchings and restorations, however, a few stand, as we have said, signal and prominent. They are those of Cologne, Chartres, Metz, and Strasburg, with, in a lesser degree, those of Rouen, Saint-Denis, and Troyes. Yet others have no less been given up to the destroyer—at Angoulême, at Bourges, at Cahors, at Dijon, at Laon, even the marble mosaics of Sienna. Again, in view of certain ravages said to have been wrought by rust on ironwork, various reparations have been ordered at Rouen, at Saint-Denis, at Troyes, at Saint Peter's (Rome), at Notre Dame (de Paris), and in the marble cathedral of Milan itself. The proper restoration, or rescue rather, of such edifices, from both the processes of decay and the processes of the "restorer," becomes a question of the utmost magnitude. In France it is computed that there exist in our day forty-eight cathedrals which—it is computed by M. Viollet-le-Duc, upon a calculation into which we dare not follow him—have cost, from beginning to end, 250,000,000 of francs, and which are maintained, in rather "a ruinous integrity," for about £40,000 a year. This £40,000, says the same authority, is totally unequal to its object; it is not a hindrance of decay, it is simply a postponement of ruin, and there is evidence to show a similar disintegration is threatened over the entire Continent. In point of fact, there is scarcely a cathedral which has not been, in a certain degree, dismantled, and which does not require in the same degree to be restored. But in what "sense" are these restorations to be made? The guardians of Notre Dame de Paris declare that they tremble when they reflect upon the probable architectural fate of Metz and Strasburg. They fancy its arches contorted, its columnar clusters deranged, its inscriptions obliterated, its monuments superseded, its chapels degraded from their original sanctity. Precisely so with the great fane of Rouen, whose glorious windows are the admiration of Europe. Fifty years ago—or rather more — a conflagration destroyed its central spire, and imperilled the existence of the entire structure. The leaden roof flowed, liquid, into the streets; it has since been replaced by a covering of zinc. The inflammable spire was superseded by one of cast-iron. It now asserts for itself, in fact, an altitude superior to that claimed by the Cathedral of Strasburg; but this, it must be remembered, includes the gilded cross, with the lightning-conductor above it, which of course constitute no part of the architecture or the elevation. Here again, however, is an example of the slow process by which cathedrals are restored to form and life after once having experienced a disaster. During not far from 20 years Rouen Cathedral was enveloped by a hideous mask of scaffolding; its splendid façade was literally obliterated, and its noble interior roof was spun over by spiders. The new parts of the structure when taken down were discovered to be rotten, albeit that their masonry was no more than, comparatively speaking, a few years old; while as for Chartres, perfect in proportion and venerable in point of age, it has been "restored" over and over again, and is yet demanding reparation, with its brethren of Bayeux, Menz, Vendôme, Verona, Volterra, and, as we began, Metz and Strasburg. They are gradually but surely crumbling, these beautiful and sacred dedications of times past, and half of the European architects are engaged upon plans, theoretical or practical, in order to their preservation for future times. That of Strasburg, however, may be expected to grow into completion under the steady German genius which, while adopting the French plans, patriotically insists upon their Germanic origin. Account must be made, however, for the sufferings incurred during the German bombardment, which reached a total of nearly £50,000 sterling, the roof having been almost wholly destroyed, while the walls were shattered, even among their foundations. Seven years ago, the plans for this reconstruction were laid before Europe; and now, though of French design, they are adopted by the German Government, so that a structure which is neither German nor French, but of universal historic value, may be redeemed in its power, as a work of beauty and art, if only the "restorers may be trusted."

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THE HULL BOROUGH LUNATIC ASYLUM COMPETITION.

Second Notice.

No. 4 is a masterly set of drawings, but this competitor fails to supply a general ground-plan; he shows a block plan on a small scale, with his buildings coloured red, which is the only material the judges have to work upon. It is true that ground-plans are furnished, but they are to a large scale and very fragmentary, a block here and offices, residences, &c., there, and it requires the skill of a very practised person to mentally put them together. As it is doubtful whether a professional person will be called in to adjudicate upon the plans, this omission will no doubt materially interfere with this competitor's chance of success. This author, or rather let us say "artist," adopts a western frontage; the corridor plan is in the form of the letter U, the centre portion of the arc being occupied by a commanding block of offices devoted to administrative purposes, and to male and female better-class patients; right and left, and radiating as it were from the circular corridor, are subordinate blocks, occupied by the medical superintendent and the steward; in connection with the latter is the board-room. In the rear of these, and at right angles with the now parallel corridors, are four large patients' blocks, the foremost of which groups with the main or central block of buildings. In the centre of the court formed by this corridor stands the kitchen block, the rooms of which are somewhat small, and in which the kitchen is too far removed from the dining-hall; over these are extensive associated dormitories. In the rear of this group, and at easy distance from the wards, are two spacious dining-halls and a recreation-hall, connected with which is a billiard-room. Terminating the rear are workshop and laundry blocks, with dormitories above. The infirmary is placed as an independent building towards the north-east of the plot; and, as a counterpoise, the chapel is placed to the south-east. At first glance these appear too far from the main building; but the author's object in this is to allow for extensions to the main corridors, and the addition of further patients' blocks, as shown in half-tint on the plan. It will be seen that this corridor arrangement is extremely simple, and that it lends itself with admirable grace to any subsequent extension; but objection might be taken to the rear blocks being overlooked by the back windows of the front blocks. This can only refer to the upper lights, as the lower ones are screened by the partition walls of the airing courts, the latter feature being an excellent arrangement, provision being made for separate courts, with separate access to each floor of each ward.

The buildings are designed with a master hand in the Queen Anne style of architecture, and they are illustrated by two excellent perspectives, the colouring of which constitutes them real works of art; but the sight-line being on the ordinary level, they fail to supply the place of the absent general ground-plan. The central block, which forms the key-note in the western elevation, is a commanding three-story structure, the upper windows being partly in the mansard roof. This edifice is backed by a large clock and water-tower. The corridors, pairing off to the patients' blocks, are upon arcades, the flat roofs of which are terraces connected with the first floors of all the principal blocks, and to which they form pleasing adjuncts. The patients' blocks are duplicates, the ground and first floors closely corresponding; they each contain large day-rooms and three associated dormitories. To these are added six rooms for refractory patients, and well-arranged, but rather small, sanitary offices. The total accommodation is 476, and the estimated cost £70,000. This, judging from the ornate character of the work, is a low estimate; but there is certainly great economy used in the general arrangement.

No. 5 has a parallelogrammatic arrangement of corridors, and the blocks are very creditably disposed. This author places his recreation-hall over his two dining-halls. This plan is peculiar for the number of separate rooms it provides, of which we counted no less than 165 in a total accommodation of 400. This strikes us as an innovation on the accepted rule of asylums, and one that closely pertains to prisons, and hereon it is strange that the author terms them "cells." The style of architecture is Domestic Gothic of a poor, weak order; the principle of sanitation recommended is "Moule's Earth Closets," and the warming by "James' Stoves," the invention of Dr. Bell. The estimate is £42,000.

No. 6 is a set of remarkably plain drawings; the buildings are proposed to be carried out in buff or yellow bricks, with red courses; the architecture is not pronounced, it may consequently be classed as that of ordinary villas. The corridor arrangement is similar to that of No. 5; but the author is peculiar in the arrangement of some of his patients' blocks, inasmuch as he places the dormitories on the ground-floors, and the day-rooms above. This plan may be said to be based on the block principle; but objection may be taken to the spreading character of the buildings, which in great measure is owing to the one-story arrangements being unnecessarily strained. There can be no legitimate reason why two, or even three-story buildings may not be indulged in, in the case of administrative and other offices.

No. 7 is a western elevation; the corridor arrangment is one long stretch across the entire land, an arrangement the fall of the land from north to south condemns. The six patients' blocks—three on either side of the central block, a three-story erection with a tower and spire over the main entrance—are long narrow constructions, the western ends of which form part of that elevation, and through which the corridors pass, or rather upon which they are threaded. These blocks are so placed that they overlook one another in an objectionable manner; they are provided with steep pitch roofs, which are plain bold constructions in the side elevations. The kitchens are well arranged, and their author provides a servants' hall, which is a very desirable adjunct. The style of architecture is Domestic Gothic, of a somewhat poor and mixed order. The general effect of the whole, as seen by the bird's-eye view attached, is not satisfactory. The warming and ventilating is very ably shown on one sheet of drawings, and we regret our pressure of space will not enable us to notice them in full. Suffice it to say, they are modifications of the system adopted at St. Thomas' Hospital, London. The accommodation is for 400, and the estimate, which includes Dennett's fire-proof floors, is £44,000.

No 8 is a rough, not to say unfinished, set of drawings, and the author adopts the exploded system of dark central passages in his corridors, from which access is obtained to groups of single and other rooms; and he adopts the questionable plan of three floors to his wards. No general dining-rooms are provided; but we find small ones placed all over the buildings, and at objectionable distances from the kitchens. The style of architecture is no doubt intended for Renaissance; but, owing to the rough character of the elevations, it is impossible to read the author's intentions. It is amusing to find this competitor descrying highly-finished drawings and perspectives as misleading, and at the same time running so far to the opposite extreme that it is impossible for the judges in this competition to grasp his meaning. We could not learn the materials of construction, but the estimate is given as £65,300.

No. 9 is a very commonplace production in the Gothic style, and has no features that would rise above those found in ordinary villa architecture. Setting aside the architecture itself, there is an evident want of breadth and feeling on the author's part. Take, for instance, the south entrance, which is composed of a small triangular yard attached to the side of the resident's house, leading into a passage or corridor, the size and proportions of which are only suitable for an ordinary dwelling. A conspicuous feature in the plan is a large semicircular corridor, the object of which is not clear, unless it be to obviate passing through the kitchen in following or tracing the line of the main corridors. The material of construction is brick and stone dressings, and the estimate is given as £27,500.

No. 10 is a set of drawings prepared by a sound, practical, but commonplace architect. Leaving the architectural merits of the elevations out of the question, this is a production that will closely pair with No. 4. The ground-plan is very similar, except that the semicircular corridor is struck much larger in its radius, and the central block is less imposing. The six patients' blocks are placed radiating from the circular corridor in a manner similar to the spokes of a wheel, terminating with the rear ones on the chord line of the arc; these blocks may not overlook one another in the rigid manner of those placed on the square, but the sacrifice in the appearance and grouping of the building is very great, as they could be viewed at no angle that would give a uniform elevation. A geometrical elevation is given of the whole building, which looks fairly satisfactory; but such could not have been the case had a "bird's-eye," or a perspective view been furnished. The corridor in this case is two stories in height, each range or floor being glazed. The general planning of the buildings is everything that can be desired. The dining-hall, situate in what the author terms the "commissariat department," adjoins the recreation hall, into which it has side openings. The blocks are well arranged, and the sanitary offices, which are attached buildings in their rears, are spacious constructions, carried up to a considerable height as water and ventilating towers. For the latter purpose they may be necessary, but for the former they appear superfluous, as the tower over the main entrance is fully capable of performing the office of the water tower for the whole of these ground and first-floor offices.

The style of architecture is extremely plain and commonplace; from the ranges of circular-headed windows it may be referred to the Italian villa style; but under this head it is only fair to say, that, beyond a plentiful display of light, there are no features to commend. The material of construction is red brick with stone dressings, the estimated cost is £64,620, or £160 per bed, which in our opinion is a fair and honest estimate. The author states that he has had thirty years' experience in asylum architecture in both England and Scotland, and that he has been engaged on twelve or fourteen such buildings. These are assertions we may safely indorse, for he is evidently a sound practical man.

No. 11 furnishes a very good Gothic elevation; but as his blocks are all of three floors, and he adopts the central corridor system, there is not much chance of the author gaining a place; indeed, we think his omission to furnish either report or estimate will place him out of court.

No. 12 is a poor, weak production, faulty in the corridor arrangement in the neighbourhood of the kitchens, and objectionable in the general arrangement of the blocks; the author is evidently a man of very limited experience in connection with such works. The estimate is given at £53,000.

No 13 is the low-water point of the competition; the author has furnished a design for a small brick factory.

No. 14 is a voluminous work, one that has been entered into by this competitor with a deserving amount of spirit. The plan is that of a series of parallelograms, and the author has run into the general error of merging his main corridors into what should be the private corridors of the blocks, from which it is plain they could not be traversed with privacy, and that in places the visitors or the officials would have to pass through the throng of the patients. In more than one case the continuity of the corridors is broken by serving as waiting-rooms, by day rooms, dormitories, and by what the author terms "gallery dormitories." The central feature in the south front is a semicircular bay of two stories, in which are three windows on each floor, and the interior is devoted to a staircase connecting the platforms or stages of the dining halls with that of the recreation hall above, from which it is plain that these will in great measure be blind windows. The epileptic patients are unprovided with day-rooms. The staircases are placed at random, and over them are imposing water-towers; these are not placed to serve the purpose of ventilation, hence five out of the six are superfluous. The style of architecture is Italian, with which are merged details of "Jacobean" and "Queen Anne" architecture. The accommodation is stated at 400; but as the beds are not shown, this cannot be easily confirmed. The cost is given as £38,000 for the building proper, or £95 for beds, and with the adjuncts, £56,000.

No. 15 is a similar arrangement to the last, but the uniformity of the south elevation is interfered with by the introduction, in the form of a detached building, of the chapel. The several offices are compactly arranged; but the author has not availed himself of the opportunity he might easily have seized of lighting his kitchens from the adjoining court in preference to making use of roof lights. The ground-floors of all the blocks are remarkable for having verandahs for the patients using the airing-courts. The east and west elevations are made up of one-story blocks, devoted to violent and troublesome cases, the front portion of which are day-rooms, into which the main corridors merge. In the north are blocks for recent cases. These have dining-rooms connected with them, a feature we have not seen in the case of the other competitors, and one the necessity of which we question. This author confines himself to one water and clock-tower. The style of architecture is Domestic, of the Tudor type, with a Decorated chapel, all parts being plainly but pleasingly treated. The arrangement of the asylum is rather spreading, which arises from a somewhat undue proportion of one-story buildings. The "bird's-eye" view is corrected in this respect, for in it the laundry and workshop blocks are shown as two-story erections. The estimate is £56,140. Speaking generally of those having for their ground-plan this arrangement of corridors, this, in our opinion, is one of the most commendable.

No. 16 is again on the same plan. The chapel is here brought to the front, where the altar is placed towards the west. This author uses his dining-hall jointly as a recreation-hall, which is a bad arrangement, necessitating the removal of the tables after every meal; but he avoids the common error of merging his principal corridors into those of the patients' blocks by placing them a short distance in the rear. The central feature in the south elevation is the chapel, which from being a one-story erection, and having nothing to support it in the rear, will have a somewhat vacant look against the great two-story patients' blocks. The general style of the architecture is Classic; but the outlines of the chapel, with its steep-pitch roof, are decidedly Gothic. Taking the gauge of those exhibited on this plan or arrangement, it may fairly be classed as a very creditable production. The estimate is based upon 4½d. per foot cube, which works out at £47,980; to this is added a further £10,000 for lodges and other adjuncts, which equals £140 per patient. An alternative plan is shown, in which six of the blocks are enlarged, and two are done away with, which, it is presumed, would reduce the cost about £4,000.

No. 17 is a very confused ground-plan, on the same principle as the last. This author has four patients' blocks in all; but, for some cause we cannot divine, he divides each of these into two blocks; the plan of them may be said to resemble a double cross with the arms attached. This author confines himself to one clock and water tower, which is a principal feature in the composition. This design is faulty from the principal entrance being of one story, and the vestibule and corridors connected with the same being very cramped and small; also from the plan being chopped up into an interminable number of small offices, and what is more, from the poor character of the architecture.

No. 18 is again on the system of a series of parallelograms. The blocks forming the wings to the south elevation are connected. The distinction is effected by placing the extreme portions in a receding position. These are constructed with enormous corridors and small day-rooms, from which it is clear that the patients are intended to occupy the main corridors. The sleeping accommodation on the ground and first-floors is very limited. This is made up by a second-floor devoted to associated dormitories—an arrangement that will no doubt be objected to. The style of architecture is Gothic of the Domestic character, very pleasingly handled. The cost is estimated at £33,500, but upon what basis is not stated.

No. 19 is a set of well-drawn designs. The author gives a large dining-hall, the ends of which he screens off as a small recreation-hall and attendant's room. The patients' blocks are planned in the form of the letter T, and are connected with the main corridors. These blocks are provided with central corridors, which do not appear to be well furnished with light. The beds in the dormitories are arranged in pairs side by side, which is not a desirable plan. The epileptic blocks are each one-story erections, in connection with which there are no day-rooms. The uniformity of the south elevation is destroyed by the introduction of the residence of the medical superintendent. Independent of these details the plans are a very creditable production; the elevations are designed with considerable taste in the Gothic style, Domestic in its type. The accommodation is for 406, and the estimate is £50,000.

No. 20 is a well drawn set of plans designed in the Italian style, the principal feature of which is a free treatment of coloured bands of brickwork. The ground-plan, in the arrangement of its corridors, is a cross between the parallelogrammatic and the semicircular systems, being in the form of the letter V. The administrative block, which is also the main entrance, occupies the point or intersection of the corridors; this is of three stories; at the corners of this block are placed the superintendent's house and the chapel, which is not oriented. The kitchens, except the serving-rooms, are well arranged; but not so well lit as ventilated; the author provides small dining-halls for the attendants, which, considering they have no servants' hall, is a sensible arrangement. The patients' blocks, attached to the wing corridors, are six in number, the terminal ones, varying in character, being three stories in height, and devoted to chronic cases. There is great merit in this production, but objection may be taken to the introduction of three-story wards, and to placing the house and chapel, which are discordant, in the centre of the main façade. The accommodation is for 400, and the cost £64,000. From the report we learn that this production emanates from London.

No. 21 has a confused ground-plan, which reminds one of a French latch-key, with an elaborate arrangement of wards. The central block is pushed back into the great square, and the dining-hall, a prominent feature, forces its way between the wings, and thus forms part of the south façade. The wings are in two divisions, the extreme portions receding in a marked manner. This author shows an alternative ground plan, and as this provides two dining-halls it is much the best. The general arrangement of the wards is very creditable. The style of architecture is Gothic, somewhat ornate in its character, but poor of its kind. Objection may be made to the manner in which the wards overlook each other, and to the number of towers introduced in the design, some of which are evidently for look-out purposes. This author shows a "bird's-eye view," isometrically drawn, which, for the purpose of this competition, is somewhat out of place. The estimate is £55,000.

No. 22 adopts the corridor form of No. 20, but he does not mar his principal elevation by introducing the house and chapel. This author places his house at too great a distance from the asylum. The plan of the blocks resembles that of No. 19, but their corridors are badly provided with light, being blocked at one end by small still-rooms. We have here but one dining-hall, which we find doing office for the recreation-hall. The architecture is good in its character, being Gothic of the Domestic type. This author shows an alternative ground-plan, which provides separate dining-rooms and a recreation-hall. Taken with these amendments, this is a very praiseworthy set of drawings, and amongst those adopting this angular form of corridors it is decidedly the best.

No. 23 is similar in its block plan to No. 21. The blocks are here kept private by a public corridor in their rear, with which they are connected; but from this corridor being only one story, the first floors, although plentifully supplied with staircases, are not so happy in their arrangement. The dining-halls in this case are too far removed from the kitchens. The chapel is not oriented, the altar being towards the north, and the recreation-hall is wholly in the male half of the establishment; the architecture is poor in its details, the Gothic order being chosen. The estimate is £52,500, or £127 per bed. This competitor exhibits in duplicate: in the latter case we find the chapel turned with its altar to the south; he here carries his public corridors through his patients' blocks, and he provides separate dining-halls and kitchens to the male and female portions of the asylum, which are far removed. The architecture in this case is Classic, but of a poor type; the estimate is £45,000.

No. 24 is arranged on the plan of Nos. 20 and 22. It is made up of a centre and eight receding blocks—four on either side. The uniformity of the elevation is again destroyed by that incubus, the superintendent's residence. The only entrance towards the south is very poor and cramped, one dining-hall only is provided, and the serving-rooms are badly arranged; no recreation-hall is here shown. The patients' blocks are each provided with two staircases, one of which appears to us superfluous, and the associated dormitories are in some cases long narrow galleries, the beds being placed against a central wall, through which, and passing between the beds, access is gained to separate sleeping-rooms, and to the sanitary offices. The architecture, as may be inferred from the above remarks, is not of an order to require our notice.

No. 25, is a peculiar arrangement of plan. The central block is the administrative, in the rear of which are the kitchens and other offices, by no means creditably arranged. The left main corridor is arranged to recede from the main block at an acute angle, and the right to advance at the same ratio; on each of these are placed, or threaded, oblong patients' blocks in parallel lines, which overlook each other in a very objectionable manner. The western portions of these blocks, and those which group with the central block, are but one-story in height; these are mainly devoted to the purposes of dormitories, in which the beds are arranged in groups or blocks of four. In connection with the western front are four groups of buildings placed at random, devoted to such purposes as the workshops, chapel, laundry, and superintendent's house. There are, practically, no elevations with these drawings other than what appears in the "bird's-eye views," which are very misleading views, inasmuch as the base lines are placed parallel with the main corridors, instead of with the south or west boundaries of the land. The merit of this plan is stated by the author to be, in fact, that the blocks are placed *en echelon*. The estimate is given as £60,000, or £150 per patient.

No. 26 is a poor, weak production; the recreation-hall is placed side by side with the chapel, which has its altar towards the south. The superintendent's house is again an eyesore in the main façade. The arrangement of the patients' blocks, for recent and acute cases, is peculiar, inasmuch as they have corridors on either side, with single rooms between, the mode of lighting which is not clear. Other patients' blocks, for chronic cases, are shown, the ground and first floors of which are arranged and figured as day-rooms. If we follow the author literally, there are no dormitories for these patients, but there are certainly no single rooms, other than two on each floor, which are intended for excited patients. The prime objections to this plan are the number of patients' blocks, no less than twelve being provided; their proximity; and the manner in which they overlook each other. It is a plain Italian composition, estimated to cost £50,000.

CONDITIONS OF SALE.*

WE have on our table a recently published and very useful little guide to the "Law and Practice as to Particulars and Conditions of Sale," written by Richard Henry Cole, Esq., A.K.C., of the Inner Temple. It will be admitted by all who are interested in sales of real property, either as purchasers or vendors, or professionally engaged in them, that difficulties and vexations not unfrequently arise touching the title; that not less often misinterpretation is placed upon clauses, making it desirable to have conditions prepared to meet all the questions that are likely to arise in the conveyance of property. Mr. Cole's little book appears to satisfy the inquirer on these points, by giving him useful hints on the law, by citing various cases thereon, and furnishing forms of conditions of sale of freeholds and leaseholds, in one and several lots. These forms have been prepared with especial reference to the Acts 37 and 38 Vic., c. 57, which facilitate the transfer of land, and have amended the law of vendor and purchaser in relation thereto. The author justly says:—"The conveyancer in preparing conditions of sale has to consider what the vendor's estate in the property is, and what evidence there is forthcoming to prove such estate; then, as a prudent traveller preparing for a long journey carefully provides everything that may be necessary, whilst rigorously excluding any superfluity, so the draughtsman, while providing for any objections or requisitions which the vendor is unable or unwilling, on account of expense or otherwise, to remove or comply with, carefully avoids those strict sweeping clauses which very probably would deprive a purchaser of rights which no one objects to his having." A few very necessary hints are given regarding "particulars of sale," which we commend to the attention of those who generally draw up these documents. Of course a favourable impression of the property to be sold has to be produced upon the minds of the public, and the auctioneer often resorts to every point of attraction he can think of, and uses high-sounding and euphemistic language; but these laudatory expressions often tend to misrepresent, and any material misrepresentation or concealment is sufficient to allow a purchaser to rescind his contract. The law appears to be that "mere expression of opinion will not avoid a sale, but mis-statement of facts will." Thus, where a house was described as "substantial and convenient," as having five bedrooms, when, in fact, it was only half-brick thick in many places, and where two of the bedrooms turned out to be mere closets without fireplaces and external doors, the purchaser was held to his contract (Johnson v. Smart). Where, however, property was stated to be within a mile of a borough town when it was between three and four miles distant, the purchaser was allowed to rescind (Duke of Norfolk v. Worthy). If a house is untruly described as not being damp, specific performance may be refused. Again, it is necessary to bear in mind that where the defect is latent—that is, where the purchaser could not discover it by ordinary care—the vendor is bound to point out the weakness, or the purchaser may refuse to complete purchase. So with regard to a plan that is incorrect, the purchaser may refuse to complete the contract.

The author observes that it is seldom advisable for an auctioneer to prepare the "conditions of sale," as serious mistakes have arisen from the auctioneer mistaking the nature of the property sold. We imagine that this recommendation is seldom acted upon in ordinary sales. We advise all intending vendors and purchasers to read Mr. Cole's excellent advice upon this point, as we are quite sure it would save many a misunderstanding and lawsuit. Of course, conditions are generally construed against the vendor, and this is perfectly fair and justifiable, for the vendor naturally takes care to conceal any point of doubtful meaning, or any defect in the title. It is now a misdemeanour, punishable as fraud, to suppress "any deed or instrument material to the title," so as to induce a purchaser to accept it. There are a few facts that are desirable to be kept in view in the selling or purchasing of estates; such as that a vendor is bound by the act of his auctioneer, that the latter cannot without being authorised receive the purchase-money, and is liable for any loss or omission from defective conditions. Advertised particulars of sale are held to be misleading, and the sale can be set aside if the conditions read at the time of sale disclose other things, as, for example, that the property is sold subject to mortgages (see case of Torrance v. Bolton). The author also observes:—"When it is necessary to alter the printed particulars or conditions of sale, the alteration ought to be made in writing and read aloud by the auctioneer before the sale, and a copy of the particulars and conditions so altered, signed by the parties to be bound thereby." Sales by trustees are even of greater consequence than those of ordinary kind. Greater vigilance is necessary to protect the title, and the conditions require to be drawn up with increased care.

We extract one of the forms prescribed by the author as suggestive of conditions of sale for leaseholds in one lot. The form is as follows:—

"1. The highest bidder shall be purchaser, and if any dispute arise relative to any bidding, the auctioneer may determine the same, or put the lot up again at a previous undisputed bidding. No less advance than £— shall be made and no bidding shall be retracted. The vendor reserves his right to bid by himself or agent.

"2. The purchaser shall, immediately after the sale, pay to the (*auctioneer* or *vendor's* solicitor) a deposit of (£10) per cent. of his purchase-money, and sign the subjoined agreement, and shall complete his purchase and pay the remainder of his purchase-money at the office of Messrs. ——, at ——, on the —— day of —— next, on which day the purchaser shall be let into possession, or into the receipts of rents and profits of his purchase. Up to such day the possession or the rents and profits will be held or received, and all outgoings, other than those payable by the tenants, satisfied by the vendors. The purchaser shall take the tenants' fixtures at a sum mutually agreed on or fixed by a fair valuation. And if from any cause whatever, the purchase be not completed on the day in that behalf above-mentioned, the purchaser shall thenceforth, till completion, pay interest on his purchase-money, and on the sum fixed for tenants' fixtures at the rate of (£10) per cent. per annum.

"3. The vendor shall deliver to the purchaser, or his solicitor, an abstract of title, subject to these conditions, and all objections and requisitions in respect thereof, and of all matters appearing in the abstract, particulars, and conditions (if any) shall be delivered in writing at the office of Messrs. ——, at ——, within —— days from the delivery of such abstract, or be considered waived; and in this respect time is to be deemed of the essence of the contract. If any objection or requisition be delivered as aforesaid, whether a matter of title or conveyance, with which the vendor is unable or unwilling to remove or comply with, he shall be at liberty, notwithstanding any attempts to remove or comply with the same, or any litigation, to rescind the contract and pay back the deposit without any interest, compensation or costs.

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* The Law and Practice as to Particulars and Conditions of Sale; with Notes and Forms, &c. By RICHARD HENRY COLE, ESQ., A.K.C., of the Inner Temple, Barrister-at-law. London: Reeves and Turner.

"4. The title shall commence with the original, lease, dated , and expressed to be made between A. B. and C. D., a copy of which will be produced at the sale; and the receipt for the rent last payable under such lease shall be conclusive evidence of the due performance and observance of or waiver of any breach of the covenants and conditions contained therein up to the completion of the sale.

"5. The purchaser shall admit the identity of the property described in the particulars with that comprised in the title deeds; but the vendor will (if desired) execute or procure at the purchaser's expense a declaration that such property has always been held under such title since the granting of the above-mentioned lease. The admeasurement shall be presumed to be correct, and no compensation shall be allowed or given for any error, omission, or miscalculation, nor shall the sale be affected by the same. The purchaser shall prepare, and on the completion of the purchase, the vendor shall execute, all such assurances necessary to assign the premises to the purchaser, and execute and do at the purchaser's expense all assurances and things (if any be required) for getting in and extinguishing any outstanding estate or interest, or any other purpose whatever; every such assurance to be left at the said office of Messrs. at not less than (ten) days before the aforesaid day of next.

"6. The vendor is a trustee [mortgagee], and shall only be required to covenant that he has done no act to incumber. The concurrence of the parties beneficially interested shall not be required.

"7. The production of any muniments of title not in the vendor's possession, which the purchaser may be entitled to require, and all attested or other copies of, or extracts from, any rolls, registers, deeds or other documents, whether in the possession of the vendor or not, and all declarations, certificates, and other evidence required for the completion of the title, identification of the property, verification of the abstract or otherwise, and all searches, journeys, and other expenses incidental to the above purposes shall be borne by the purchaser.

"8. If the purchaser shall fail to comply with any of the above conditions, the vendor shall be at liberty to vacate the sale, forfeit the deposit, and resell the property, either by public auction or by private contract, subject to such conditions and stipulations as he may think fit, with or without giving any notice to such purchaser; and all expenses incidental to such resale, and any deficiency in price shall be recoverable from the purchaser by the vendor as and for 'liquidated damages.'"

A memorandum of contract is also given signed by the auctioneer as agent for vendor and the purchaser, in which the purchase, amount, and deposit are stated.

A form similar in its main clauses is given for leaseholds in lots. In the latter case the conditions of purchase of the several lots must be stated. Freeholds sold in Chancery, sale of surplus property of a company, and various other information are treated of in a concise manner, and an appendix is added containing the "Vendor and Purchaser" and the "Real Property Limitation Acts" of 1874. Mr. Cole's handbook, in short, will be found to give in a small compass all that vendors or their agents need to know, and for auctioneers and surveyors it will be found a thoroughly practical guide in the preparation of particulars and conditions of sale.

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LECTURES ON SANITARY QUESTIONS.*

A SERIES of lectures on the prevention and control of infectious diseases, and on air, water-supply, sewage disposal, &c., have been lately delivered under the auspices of the Lord Provost, magistrates, and Council of Glasgow, which are now published in the shape of a bulky pamphlet. The first portion of the lectures are by Dr. Jas. B. Russell, Medical Officer of Health, and the latter by Dr. William Wallace, F.C.S., City Analyst, and, though we cannot say that they deal with any new features of the subjects discussed, the facts are ably presented and in a popular guise. Dr. Russell speaks with some authority on the theory of infectious diseases and the controlling circumstances of infection, and gives some practical hints as to the growth and prevention of epidemics and the management of infectious diseases at home. We will not discuss the opinion advanced on the theory of infection, nor the subtle distinction between the forms of infection and contagion, but confine our attention to practical suggestions. Dr. Russell's opinion is that the infecting element in all specific and transmissible diseases "is an organised solid something having weight and dimensions"; that whether they are independent existences, belonging to animal or vegetable life, or not, the particles that leave the infected body pass into the surrounding media, of earth, air, and water, and remain active for mischief, unless checked or destroyed by sanitary agencies. The advantage of porous over wet soil is pointed out, and the active and self-purifying agents, air and water, are cleverly illustrated in the alternate action going on in the surface soil, by the constant succession of dampness and dryness — a species of breathing producing the combustion of organic matter, and the evolution of gases. Ground-air and ground-water, as these two agents have been called thus, play an important part in the economy of nature, destroying and dispersing all offensive matter, and keeping the upper air and soil clean. Some very clever diagrams are given to illustrate the relation of density of population to the death-rate. These exhibit, by circles of the same size, like areas, the relative number of dots in them being made to represent to the eye the different relations in which the inhabitants of different districts stand to each other. Thus Dr. Farr's law of density is made very intelligible. Beginning with the rural or thinly-peopled districts, the first circle represents 53 rural districts, having a mean proximity in yards, between one person another, of 147; acres, per person, 4·0; persons, per square mile, 166; and death-rate per 1,000, 17. If we turn to the circle representing Manchester, the proximity in yards is only 17, each person has only 0·051 of an acre, there are 12,357 persons to the square mile, and the death-rate is 28. Turning to the graphical measure of Glasgow, the density is much greater. Here the population is massed together in the proportion of 53,224 persons per square mile, the mean distance apart of the people is only eight yards, and the death-rate is 30·292. Comparing this frightful density with the 10 rural counties of Scotland, the contrast is both startling and conclusive. The Registrar-General shows that each man, woman, and child, in these counties, enjoys an area of 16 acres, and is 296 yards from each of his or her neighbours, while only 17 per 1,000 die annually. What do these facts teach? Why, that the law of human health is inversely as the density; or, in other words, that the mortality is directly as the density of the population. Dr. Farr, taking the average death-rate of each group for the same period, finds, in short, that just as the density increases, so does the death-rate. In the most sparsely-peopled rural districts, with 166 persons to the square mile, there is a yearly mortality of 17 per 1,000 of the population, while in the most closely-peopled districts having 65,823 persons per square mile, there is a yearly mortality of no less than 39 per 1,000 of the population. The registration districts of England and Wales have been for this purpose divided into seven groups, and these are illustrated by the circles in Dr. Russell's lecture. The author eloquently expatiates upon what density really means in Glasgow. "It means," he says, "that three-fourths of human beings live in houses of one and two apartments, that those houses are built in tall tenements, so arranged on the earth's surface as to exclude the sunlight, and impede the circulation of the air, more especially that a large proportion of those tenements are arranged in hollow squares, which are boxes of stagnant air. It means that inside those boxes there are ashpits and privies, the superficial area of which, at a moderate computation, is 4¼ acres, that planted among those ashpits we have hundreds of 'backlands,' along with stables, byres, bakehouses, workshops, washing-houses, and other smoke and effluvia-producing erections; that the stairs are often close and badly ventilated; that they are at best vertical streets with lanes and alleys branching off at the several landings; that houses in flats planned for occupation by one family, are occupied by several families, each renting one or two rooms, and the lobbies dark and tortuous, by which they reach the stair." All these, as Dr. Russell shows, are evils due to human ignorance and perversity, and can be removed or controlled. Our own hands have made them, and only our own hands can unmake them. They constitute the "epidemic constitution" of our districts or towns. Another diagram exhibits the composition of the death-rate in rural districts and in Glasgow, illustrating the proportions of death from zymotics, pulmonary diseases, and unclassified diseases. Thus, the short column shows the composition taken at a mortality of 17 per 1,000, and the tall one represents Glasgow at 30 per 1,000. These columns are drawn to a scale, and the three strata of diseases we have mentioned are distinguished by colours. The principal fact impressed upon us is that the diseases which kill in the city are different in kind and degree from those which prevail in the country. In the first place, we see that the undistinguished and unclassified diseases are much the same in both cases, in the city it is rather less in proportion. But the death-rate from diseases of the lungs in the dense city is considerably more than in the open country; while the zymotic class is shown as even more marked a feature in the towns, where they destroy three times as many lives as in the country. Next, the author shows by similar diagrams that Glasgow has its own breeding-places of infectious diseases; that none of these are ever totally extinct. In respect of typhus, enteric fever, scarlet fever, measles, whooping-cough, and diphtheria, Glasgow is declared to be self-fertilising. Referring to Dr. Russell's columns, we find that the shortest, standing for the healthiest district—that of Kelvinhaugh and Sandyford—has a density of 35 per acre and a death-rate of 19 per 1,000. Others, representing Calton, Gorbals, High-street, and Closes, increase in almost regular proportion till we come to Bridgegate and Wynds, with a density of 512 and a death-rate of 45. One important fact is brought out by this comparison, which is that, with regard to the general mortality, the contrast is greater between the healthy and the unhealthy parts of Glasgow than between Glasgow as a whole and the open country; showing that it is not the situation, the soil, or the climate common to the whole area which produces the high death-rate. The author next discusses the history and development of infecting particles, or the organised living entities endowed with properties for propagation. All infectious diseases tend to increase at a geometrical ratio, and the author urges the fact that they can be prevented only by directing appropriate measures against each single case. Milk provides nutrition for enteric contagium, and is said to have a virulent infecting power; air and water become carriers or distributors of the fertilising elements of contagia. Susceptibility is another powerful cause of propagation, and children, the author tells us, are particularly susceptible to infectious diseases. Certain physical conditions favour also the susceptibility to attack; some conditions, as over-fatigue, starvation, &c., increase it. The author also fairly establishes in this way the degree of insusceptibility which may be acquired by prolonged exposure to infection. Country people, for instance, transported at once from the air of the country into that of a town, are more susceptible to town diseases than thoroughbred town people of the same age. The growth of an epidemic of enteric fever is represented by a diagram, showing cases that arose from a dairy-farm where the water supply and arrangements were defective. Here within a few days several cases appeared, and in 14 days a group of three cases were developed who were supplied with the same milk, and within eight weeks at least 166 persons were laid down with enteric fever. There is in all diseases of this kind certain periods of incubation, and the author urges the necessity of an enactment enforcing first the registration of all cases of infectious diseases, and second the temporary seclusion of other members of the family who may have the contagia incubating within. These last should be removed to a reception-house—a power conferred on local authorities, but which it appears is not acted upon. Dr. Russell very justly thinks this the weak point where our preventive measures break down. The reception-house should provide for the washing of the bodies and clothing. While approving of disinfection, the author strongly advises that everything be washed that will wash, and that the contents of all straw and chaff mattresses be burned, and replaced with clean. The Sanitary Department of Glasgow exposes everything to the direct action of steam for twenty minutes or more, and this treatment is found to destroy all infectious germs. After the hiding-places of disease in the inmates and furnishings are attacked, the house should be well fumigated with chlorine gas, cleansed, and stripped of all paper, &c. Every crevice and chink should be closed up before the fumigation is commenced, and the rooms left to its influence for one hour. In the hints given on the management of infectious diseases at home, the author expresses a doubt of the value of chemical disinfection, such as that by Condy's fluid. He rather insists upon the virtue of careful dusting, and the burning of the dust in the fire. This dusting should be done once a day. The linen and soiled articles should be steeped in a bath of carbolic acid and water, one pint to a gallon. The bedsteads, &c., should be well washed with carbolic acid soap, and after the dust is collected and burned, and while all the surfaces are still wet and the room closed up, sulphur should be burned, so that every crack may be subjected to the action of the fumes. The damp surfaces absorb the gas. The diagrams illustrative of the influence of vaccination on small-pox are exceedingly interesting, and show clearly from actual statistics that the well-vaccinated person is only likely to take the mildest form of the disease, if he takes it at all; while the unvaccinated is sure to become a victim to the disease, and to take it in the most malignant form. The "badly done" cases are intermediate between these, but still show a less amount of eruption in all the ages recorded than the unvaccinated exhibit.

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* Lectures on the Theory and General Prevention and Control of Infectious Diseases. By Jas. B. Russell, B.A., M.D. Also on Air, Water-Supply, &c. By William Wallace, Ph.D., F.C.S. London: Adams, Hamilton, and Co.

We cannot speak here of the lectures by Dr. Wallace upon the air and water supply of towns, the disposal of sewage, &c. Little new is advanced upon the latter subject. The author quotes the recommendations relating to sewage disposal of Glasgow, in which the utilisation of the sewage by lime or other chemical agents is discarded. Precipitation and filtration are recommended for the clearance of the drainage, and the sludge being got rid of in the cheapest possible manner. Among other suggestions are, that water closets in small houses should be discouraged, that the tub and pail system be used, that the common sewers be ventilated throughout their entire length, that house drains and soil-pipes have a system of independent ventilation, and that for dietetic purposes cisterns should be absolutely abolished when in connection with water-closets. Those who desire to refreshen their minds with facts, figures, and data, that have recently been established in relation to the fundamental questions of water and sewage disposal, and generally with the preventive measures necessary for controlling infectious diseases in large towns, will find these lectures of Drs. Russell and Wallace contain all that is necessary, besides furnishing the general reader in popular language with the recent efforts of scientific men. Very valuable features in the first part are the diagrams already described, which enable the reader to grasp visually and mentally the relations between overcrowding and the rate of mortality.

THE BRITISH ASSOCIATION.

FROM the mass of interesting matter brought under the notice of the members of the British Association during its meeting this year at Sheffield, we extract several papers which more especially concern readers of this journal. Full reports of the meeting will be found in the *English Mechanic and World of Science* for August 22, 29, and Sept. 5.

TECHNICAL EDUCATION FOR ARTISAN APPRENTICES.

Professor S. P. Thompson read a paper on "Apprentice Schools in France," which was illustrated by a series of statistical tables in the form of diagrams, and by a collection of objects made by pupils of some of the apprenticeship schools, and characteristic of the systems. Twelve years ago, at the time of the Exposition Universelle in Paris, her Majesty's Schools Inquiry Commission sought the opinion of the most distinguished of English men of science and of the British jurors at the Paris Exhibition on the question whether England was really losing her advanced position in those industries which involve the application of scientific knowledge to production. The almost unanimous opinion was that the position of Great Britain was being sapped owing to the lack of technical education. The question of apprenticeship was one of the knotty points of technical education, and it was his task to recount the results actually attained in certain experiments recently made in France in the direction of organising a new apprenticeship more in harmony with the social conditions of the age. These results were adduced to show (1) that the systematic instruction of apprentices was possible, (2) that it could be effected in several different ways, (3) that apprenticeship schools afforded a most satisfactory and economically sound way of attaining this result, and (4) that this new apprenticeship solved the knotty problem of technical education which arose from the decay of the old apprenticeship. The difficulty that beset the training of apprentices in England was that they entered the workshop either too early or too late. The one who entered too early was set to all kinds of drudgery, and the lad who entered too late had usually stayed so long at school that he had lost all taste for manual labour. The problem to be solved was how to give the technical training and scientific knowledge to artisan children which their occupation demanded without detaining them so long at their schooling as to give them a distaste for manual labour. There were four solutions of the problem, all of which had been tried, and illustrations of which could be seen in Paris. They were (1) send the children to work in the factory or workshop at an earlier age, making it obligatory all through their apprenticeship that they should have every day a certain number of hours' schooling in a school in the workshop or attached to it; (2) keep the children at school as long as their education was unfinished, but set up a workshop in the school, where they should pass a certain amount of time every day, so as to gain at least an aptitude for manual labour; (3) organise a school and a workshop side by side, and co-ordinate the hours given to study with an equal number of hours devoted to systematic manual labour; and (4) send the children half the day to the existing schools and the other half to work half-time in the workshop or factory. Schools of the first type had existed in France for nearly 30 years, and at the close of 1878 there were no fewer than 237 schools of this character. So far as he was aware, there was only one school of the second type—the Ecole Communale d'Apprentis, in the Rue Tournefort, Paris. The peculiarity of this school was the workshop; training was being given to lads who had not yet completed a course of elementary education. Of the third type some admirable examples were to be seen in Paris. Some very interesting particulars were given of the progress of the Horological School at Besançon. The fourth type, or half-time school, which was English in its origin, was rarely to be found in France. Under the head of "general considerations" Professor Thompson reviewed some features common to all the divers forms of the new apprenticeship. Since the old apprenticeship had virtually lapsed there was nothing to save the young artisans of the rising generation from degenerating into a mere machine unless a new agency could be practically organised. What was claimed for the apprenticeship school was that its pupils do not possess just a bare minimum of knowledge sufficient to procure them means of subsistence in one narrow department of one restricted industry, but that they possess both manual dexterity and a fair technical knowledge which would enable them not only to earn more and to turn out better work, but also to be less at the mercy of the fluctuations of trade for the means of subsistence. The few trades unions existing in Paris appeared to be convinced of the truth of this. Besides the new apprenticeship being better for real instruction in technical principles, it was also better for practical work, in so far as it shortened the needlessly long years of the apprenticeship, and imparted at an earlier age all the manual capacity that apprenticeship in any form could impart. There were not wanting signs on our horizon of significance in the problem of the relation of science to labour. We had really skilled workmen, and no foreign workmen were their equals, but they were only units in a crowd. The English people were growing impatient of the increasing incursions of foreign trade; they had seen the silk ribbon trade vanish, home-manufactured tools were being displaced by imported ones, and there was a deluge of watches from foreign markets. People talked of inequality of duties, quite forgetful of the fact that if the products of our skilled industries were only superior to those of foreign markets, no one would want to buy foreign rubbish, nor would it pay anyone to import it. If free trade was ultimately to prevail all the world over, then only by possessing superior workmen could the less advantageously-situated countries compete with the industries of those which have abundant mineral wealth and other natural advantages. If, on the other hand—as at present seemed more likely—free trade was not to be definitely established between the nations, then clearly the nation which had natural advantages could only hope to avail itself of those advantages if its workmen were at least no worse educated than those of other countries. Take which view they would, technical education, and above all, technical education of the artisan classes, was a *sine quâ non* of the future industrial prosperity of Great Britain. What steps then must be taken to give effect to the new apprenticeship? Two things would determine the success or failure of the school, (1) the obtaining of the right kind of teachers, and (2) the adoption of a system of instruction based upon drawing, which was the language of the manufactures, the handicrafts, the constructive industries of all kinds. It was evident that the first step would be the foundation of a system for training competent teachers. Then there must be a central technical college, for through such an institution alone could community of thought and method of work be obtained. The experience of France afforded a most pregnant suggestion to employers of skilled labour as to the simple and inexpensive means by which the character of the labour of their apprentices might be raised above its present level. If such a system of technical education as he pointed out was to be instituted the nation must move towards its accomplishment with a spirit very different from that in which it had viewed technical education during the last quarter of a century. Crisis after crisis had passed, and capitalists and unionist artisans would not, could not, or dare not confess that the core of all the rottenness was the failure of the old apprenticeship to cope with the requirements of the age, and the new social conditions brought about by the fierce rivalries of industry.

TEMPERATURE OF TOWN WATER.

Mr. Baldwin Latham, C.E., F.G.S., read an interesting paper on the Temperature of Town Water Supply. He pointed out that any increase in the supply of temperature beyond 55 deg. rendered water very unwholesome. The author, in this paper, drew attention to the fact that the temperature of the water supply of a town, as furnished by public waterworks, was totally independent of the temperature of the water at its source of supply, and that invariably the temperature of water was the temperature of the ground at any season of the year at the depth at which the distributing mains were laid. The average temperature throughout the year, whatever the source or mode of supply, varied very little, but there was great difference in the range of temperature, and that while the temperature in the chalk wells at Croydon gave an average monthly range, based upon daily observations, of 0·64 deg., the same water, when supplied direct from the mains, gave an average monthly range of 21·14 deg., or when stored in a cistern a range of 28·05 deg.; while water supplied from the Thames in Westminster gave an average monthly range of 24·69 deg., but the average yearly difference of temperature between the chalk water supplied at Croydon and the Thames water supplied in Westminster was only 0·67 deg.

Mr. J. Oldham, C.E., asked if Mr. Latham could tell him the various temperatures in artesian wells from 1,400 to 1,800ft.?

Mr. Latham said that he had taken a very large number of observations, and he found that the temperature of the overflowing wells at Wandsworth was about 52½ deg. The temperature of the water in wells varied very greatly. In some of the deepest wells the temperature was colder than in the shallow wells. The movement of the water through the strata of itself increased the temperature. Diarrhœa was most largely produced when the water supply became heated beyond a certain degree. Until the water delivered at towns reached something over 60 deg. of constant temperature, diarrhœa did not break out in that town. During this summer the temperature of the water had been 5 deg. less, and the result was that diarrhœa had prevailed only in a very slight degree. The temperature of water was, from a sanitary point of view, exeremely important, and one which ought to be more fully investigated in regard to its influence upon certain classes of disease.

Mr. J. W. L. Glaisher, M.A., F.R.S., said that having been long connected with the Registrar-General's office, he had frequently had to take the temperature of the Thames water. It had long been recognised as a fact that cholera or diarrhœa never showed itself to any great extent until the Thames water reached 62 deg. It stood to reason that when the water-pipes were of small diameter and laid near the surface the water partook of the temperature of the surroundings. He was in favour of having a much larger diameter of supply pipe. Water at the depth of fifty or 60ft. differed very little from the climate, but at a depth of several hundred feet the tempeature was higher.

Captain Douglas Galton, C.B., said that the water pipes should as much as possible be kept below the ground. The statements which had been made were a strong argument in favour of the abolition of cisterns, and in favour of a standing water supply.

LIME DEPOSITS.

A paper was read by Dr. J. S. Phené on "The Deposit of Carbonate of Lime at Hierapolis, in Anatolia, and the Efflorescence of the Limestone at Les Baux, in Provence." The author said he had selected these two distant sites of calcareous deposit, not alone from their picturesque beauty and effect, but because they presented, he believed, the two most widely differing conditions of a somewhat similar material probably to be found. In the former case the deposit of lime was so rapid that a large extent of country was covered with it. Its forms were eccentric, and yet so beautiful that there was hardly any style of ornament the simulation of which would not be found in it. The Roman city, which took the place of a former Grecian one, was half-submerged beneath a sea of rock of intense hardness, which, blocking up streets, temples, and vast arches, after reaching to a certain height, the level of its source, ran over the natural aqueducts which it formed as it went, and began new ones lower down, which it again and again, as it reached the level of its source, repeated. Part of the deposit was perfectly white, the other part quite black, giving the most singular appearance, as it looked like a snowdrift lying in the intensely hot sun of Asia Minor, or a cataract of snow falling over black rocks, or a frozen cascade, which could only be illustrated in drawing by giving a representation in black and white, while the other parts of the landscape were in their usual natural colours. The Turks called it Pambuk Kalessi, or Castle of Cotton, from its whiteness. The hardness of this deposit, and the rapidity of its formation, contrasted strangely with the stone at Les Baux, which, though by no means soft to cut, had from its natural cavities suggested the idea to the founders of the city of excavating their houses in the sides of the rocks quite as much as they built them outwards. This rock with little or no warning, disintegrated and discharged itself in efflorescence in the air, producing an effect as destructive to the city built there as in the former case, with quite as picturesque an effect, though from an exactly opposite cause. So much was being done now in ascertaining the component parts of stone for the purpose of hardening, as in the recent experiments on the Houses of Parliament, Cleopatra's Needle, and other well-known works, that it occurred to him that an analysis of these two rocks of similar component parts, but with varying conditions, would be well worth the attention of the chemist and the practical constructor. The paper was illustrated with views of Hierapolis.

ARBOR LOW.

Of the excursions on Saturday last, that to Arbor Low proved to be one of the most interesting. The area of this circle, which is situated only a few miles from Sheffield, on the main road by Haddon-hall, and which is formed by rough blocks of limestones of various shapes and sizes, ranging from 6ft. to 8ft. in length, is about 167ft. in diameter, and the stones, instead of standing upright, as is the case with similar Druidical remains in other parts of the country, lie horizontally on the ground. Within the circle are some smaller scattered stones, and in the centre three larger ones. It is surrounded by a fosse and vallum, and on the east side of the southern entrance there is a large barrow.

Sir J. Lubbock, who accompanied the excursionists and who read a paper in which the nature of these ancient remains was clearly described, pointed out a large conical tumulus known as Gibhill at a distance of about a quarter of a mile to the west of Arbor Low, which he said was connected with it by a rampart of earth, adding that there could be no doubt that Gibhill was a place of burial, but that the original purpose of the circle was not so obvious. Mr. Bateman had called it a temple, but the temple was the house of the deity, and even when perfect, Arbor Low could scarcely be regarded as a house. Still, just as the tomb was the house of the dead, sometimes a copy of the dwelling of the deceased, so by an obvious chain of ideas the tomb became developed into the temple. Even now, Sir J. Lubbock went on to say, the northern races of men lived in houses founded on the models of those tombs. Having to contend with an Arctic climate, they constructed a subterranean chamber, over which they piled earth for the sake of warmth, and which for the same reason communicated with the open air, not directly, but by means of a long passage. In a few instances tumuli exactly resembling these modern houses had been discovered. At Godhavn, in Sweden, such a grave had been opened in 1830, and the dead had been found sitting, each with his implements, in the very seats which, doubtless, they had occupied when alive. Thus, in some cases that which was first a house, at last became a tomb. So, again, the tomb in the same way became a temple. The Khasias were a primitive people of India, who even now constructed megalithic monuments over the dead. They then proceeded to offer food and drink to the deceased and to implore their assistance. If after praying at a particular tomb their requests were granted, they returned again, and if the success was repeated the tomb gradually acquired a certain reputation, and the person buried in it became more or less of a deity, and when a considerable celebrity had been thus acquired, other shrines would naturally be consecrated to this deity, and would in all probability be constructed on the model of the first. To the question, when the monument on which the hearers were standing was erected, Sir J. Lubbock replied that he did not know, but that he hoped one day or other that question also might be answered. There could be no doubt, he added, that many of our tumuli belonged to the Stone age; some were certainly Saxon, but from the character of the remains found in them he was disposed to refer those which clustered round Stonehenge and Abury, and, consequently, the monument before him, to the Bronze age. Sir J. Lubbock concluded by making an appeal to his hearers, in the name of the dead, to use their influence to prevent these monuments from being destroyed—unless indeed, for some great purpose.

PERPETUATION OF EARLY HISTORIC ART.

Dr. Phené read a paper on "Evidence of Early Historic Events, and Pre-historic Customs by perpetuation of design in art and manufactures in later, and even in present times." He admitted in the outset the difficulty of the subject, which he thought had not yet been opened. He selected first the works of ordinary artisans, and took as an example the carpenter and joiner of the present day. He pointed out that in Western Europe all their ordinary work was made in a rectangular manner; ordinary doors and windows, for instance, were shown not only to be so formed, but designs and sections alike always produced that which the artisan never contemplated as a part of his work, but which he unthinkingly perpetuated from his forefathers, viz., the emblem of the faith of Europe—the Cross. It would not do to say this was the result of the simplest mode of construction, because in Asia, and even in Eastern Europe, it was argued with the same persistency that a curve was not only the most beautiful, but the easiest and simplest form of construction. Of course the force of habit is great, and the artisan working continually in curved work finds it much easier than one only accustomed to the square. But the work in India, whether in plain solid work, such as had been taken as an example for Europe, or the delicate metal work, was always curved or interlaced; and the old religion of India was that of the serpent. In Persia the circular was always contending with the curved and the undulating design, and the contending religions there were the sun and serpent. In Turkey the designs, as for instance of the dome of a mosque, were formed of a series of crescents, by omitting the intermediate ones of which separate crescents existed, which appeared hardly capable of producing the design. Every Turkish article, even to the oar and scimitar, was formed of more than one crescent, and the Christian sword was as great a contrast as the French window. Gothic and Byzantine work had been introduced among the artisans of Europe, but it had failed to grow upon the soil, and was clearly exotic. The reader gave evidence that these arts were introduced by the Templars, the most cultivated men of their day, but notoriously given to the old Pagan faiths, and who met with symbols of the old faith of their Pagan forefathers in their contact with Orientals. The author then examined the art of pre-Christian Rome—not in Rome itself, but in the countries where such art was significant of matters connected with them, in Gaul, Britain, the Campagna and others. In special countries, and even in particular districts of those countries, the grand object of Pagan Roman sculpture was the serpent or dragon. He had lately officiated himself at a great dragon ceremony, in which the clergy of the district took the chief part. In this case cakes in the form of a dragon were distributed; when the ceremony is abolished the form of these cakes will not be understood; all the ordinary loaves of the district were formed like sections of a creeping thing like a caterpillar. Nothing of the sort existed in the adjoining districts. The dragon was only appeased by the death of children. These things strongly pointed to immolation to a serpent deity. The disc found on the forehead of Dr. Schliemann's cow's head, or Hera, had been perpetuated by Greek sculpters, apparently without the meaning. In the Persian mace he (Dr. Phené) produced, the cow's horns were gilt, showing, though the meaning had been lost, that the horns were those of the moon. This agreed also with the horns of Dr. Schliemann's Hera. In a bronze head of Isis he (Dr. Phené) had lately found the crescent was between the cow's horns, and this was evidently the original emblem from which the Mahommedans of to-day derived their crescent and star; instead of giving a double crescent, as the horns and crescent if perpetuated would have done, they introduced the star; but your Mohammedan, although scrupulous in praying at sunrise and sunset, would repudiate the idea that he worshipped Astarte as Isis, and does not know that he uses the special symbol of those deities. The success of Mohammed was, no doubt, greatly attributable to this emblem, as all these scattered worshippers, finding their own deity debased, gathered round his standard. He exhibited a title from the Monastery at Patmos; it had three serpents—everything at Patmos had three serpents. He also exhibited a horse from Troy; no child at Troy would be content without a horse for a toy; it was the old Trojan horse of the Iliad, which was shown by an antique bronze horse found in the plains of Argos, of exactly the same shape. A water-jug from Ephesus, made in that locality alone, was as much in the form of Diana, of Ephesus, as Dr. Schliemann's jugs were of Hera, and modern jugs gave the form of the latter. A large Italian water-jug he had represented the sun and serpent, without any intention of the maker. But evidence of their worship abounded in the locality. These were evidences quite as expressive as the etchings on bones from the caves were of what the etchers saw being so portrayed by them.

ANIMAL MOUNDS IN THE PYRENEES.

Dr. Phené read a third paper "On the Discovery of Animal Mounds in the Pyrenees." The present discovery was very greatly due to the description given by Sir Vincent Eyre, in the *Athenæum*, some time since, of a remarkable custom of burning living serpents at a particular spot in the Pyrenees. The author had long intended to make a more complete exploration of these mountains than former visits had enabled him to do, and in this case he determined to investigate all the districts around this spot of immolation. In doing so, he found in certain directions indications which always accompany these mounds. The churches abounded in features expressive of the subversion of a pagan faith of which the serpent or dragon had evidently been the representative, and with these were found built into the walls examples of pagan Roman occupation, as votive altars, &c., &c. Following the track where these were most expressive, he had come upon mounds as distinct in form to an animal appearance as that presented by any of the American mounds; they were altogether artificial, and shaped into an appearance of animal outline so real as to seem like life. In the parts forming the heads, the chamber had been appropriated, in one case by an arched chamber of Roman work, in another by a descent of several feet into the body of a small church. On the spine of the least molested one, had been a tumulus, in which, the *curé* of the church informed him, had been found several of the most primitive incinerary urns, containing bones, Celtic articles, and above these, objects of the Gallo-Romano description, and again above these, later or Christian-Roman works. One of the most interesting of the latter had been laid aside, and the *curé* sought it out for Dr. Phené amongst some *débris*; it was the stem of an ancient cross, and on it were sculptured serpents —not in the usual position of subjection to a superior power, but evidently as being in a condition of supremacy; but as there were also several dead ones represented, it might be that the sculpture figured the condition of the real serpents before and after the ceremony of burning. Everything in the district was emblematic of the serpent or dragon, and the mounds were distinctly of such a form. On the mountains overlooking these mounds were a number of stone circles, like those so well known in Britain.

THE STONE AGE IN JAPAN.

Professor John Milne, F.G.S., contributed a paper on the stone age in Japan. He described from personal examination many of the archæological remains of Japan. Kitchen-middens were abundant. Lists of the shells and the bones which they contained were given, and the character of the associated pottery was minutely described. The middens are ascribed to the Ainos, and it is noticed that the ornamentation on the pottery resembles that on the ware used by the Ainos of to-day. The stone implements found in Japan include axes, arrow-heads, and scrapers. Many of these occur in the middens. The axes are formed generally of a greenish stone, which appears to be a decomposed trachytic porphyry or Andesite. It is pointed out that the Ainos used stone implements up to a comparatively modern date. Tumuli occur in many parts of Japan, and in some cases are associated with traditions. Of the many caves in Japan some are artificial, and their exploration promises a rich harvest to the cave hunter. The paper also contained references to recent geological changes in Japan.

REMAINS FROM TROY.

Staff-Surgeon Edward L. Moss, R.N., exhibited a collection of organic remains from the kitchen middens of Hissarlik, Troy. These included bones of animals, fish, poultry, vegetable food, and pottery.—Miss Marshall (London) gave an interesting address on the subject, in which she questioned Hissarlik being the site of ancient Troy. The vases and pottery found, together with remains of animals which had been used for food, indicated that Hissarlik had been inhabited by barbaric people, and not by the refined race they would expect at Troy.

THE PROFILE OF THE ANCIENT GREEKS.

Mr. J. Park Harrison, M.A., read a paper on "The Profile of the Ancient Greeks," in which he said:—Two theories have been propounded to account for the remarkable facial lines in early Greek sculpture — one deriving them from Hellenic models, the other assuming them to have been more or less ideal; and it is in this latter view—in the absence of any trace of the feature in modern Greece (except, perhaps, in some of the islands), joined with the fact that the ancient Greek crania are without the lines in question—that is now most commonly accepted. The peculiarity in question consists of the absence of any nasal point, or, in other words, the continuity of the lines of the brow and the nasal bone, also in the close proximity of the mouth and nostril in addition to which the upper lip is often curved, and the chin more or less massive. If any superior face in point of culture possessing these features could be shown to have had intercourse with the Greeks when in a low state of civilisation, it would appear probable that the peculiarity was copied by them; and that the early Greeks when receiving their gods from the Phœnicians, copied also the features of that remarkable race.

UNDERGROUND WATERS.

The fifth report of the Committee on the underground waters in the Permian, New Red Sandstone and Jurassic formations of England, showing the quantity and character of the waters supplied therefrom, was read on Tuesday. The committee had intended bringing their inquiries to a close this year, but found that to be impracticable from several causes, chiefly from the fact that important sinkings for water were being carried out in the Staffordshire and Midland districts. Greater inclination was now shown by engineers and contractors to furnish information, and there appeared to be a greater tendency to make underground water available for purposes of consumption. Under the circumstances, the committee were of opinion that until some Government department took upon itself to collect the information to be obtained from day to day on the subject it was of the highest importance that they should continue their labours, and that their inquiry should not be limited, but should extend to the whole of the permeable formations of England.

THE TOWN OF SHEFFIELD.

Dr. T. W. Hime, Medical Officer of Health, Sheffield, read a paper on the vital statistics of the town, in which, after describing its physical topography and geological characteristics, he pointed out that, although handsome public buildings were not a prominent feature in the town, still there were few towns in England where the great bulk of the population were so well provided for in the way of domestic architecture. Overcrowding was very rare, cellar dwellings were unknown, and almost every family had an entire house, a most important agent in securing physical as well as moral health. Owing to the impervious clay existing below the subsoil, surface-wells used to be very common; most of them were closed now, and the water-supply was almost exclusively drawn from the water company, which had large reservoirs to the west. The density of the population in general in the borough was only 15·1 per acre; but a large part of the area was wild moorland, never built on, while some parts were closely packed. There had, however, been a considerable improvement in the mortality of late years. In fact, Birmingham was the only town of equal size which had had as low a death-rate during the past nine years, if London were excluded. Zymotic and local diseases were the most fatal in Sheffield. Hitherto no hospital had existed in the town for the treatment of infective fevers; but the sanitary authority was building one which would, when finished, be one of the most complete in the kingdom. Among the local diseases those affecting the lungs were the most fatal, owing to a large extent to the nature of some of the trades of the town. During the ten years 1851-60 disease of the lungs amounted to 4·247 per 1,000; and during 1862-71 to 4·867 per 1,000. Phthisis, or consumption, a disease very fatal in Sheffield, was not included in this. During 1851-60 3·061 per 1,000 fell victims to consumption, a rate which was ·364 in excess of the average for all England and Wales. An epidemic had often made considerable progress in the town before the sanitary authority became aware of its existence; but it was to be hoped that the time was near at hand when hygiene would be a compulsory subject in every school, and that as much time would be devoted to the study of the living body and how to maintain it in health as was given to the study of dead languages and of inert matter.

WORCESTER CATHEDRAL.

On Saturday last, the members of the Wolverhampton Archæological and Naturalist Society visited the cathedral at Worcester, when Mr. C. Gregory, art master, read a paper on the styles of architecture traceable in the fabric. In its ecclesiastical history, the fame of the city of Worcester commences, he said, from a very early period, and its architectural relics have formed a handsome addition to our treasures in stone, left as national hierlooms by generations coming and going to their silent home. As one of the five episcopal dioceses of the Mercian province, its early name appears in the 7th century of the Christian era. Bosel became its first bishop A.D. 680, succeeded by the worthy life of Oftfor, who was followed by Egwin, and next by Wenefrith, a man of much learning, friend and assistant of King Alfred. The see was next held by St. Dunstan, and in 961 fell to St. Oswald, founder of the Early Saxon Church, and one of the patron saints of Worcester, who introduced the Benedictine monks. Llwng and Aldred were bishops of some note; the former a friend and minister of Knut; the latter, who was translated to York A D. 1061, crowned in succession both Harold and William the Conqueror. Up to this period it will be seen that Worcester has been noted for the saintly character and talent of its divines, and the centuries following have added to the long list of celebrities; the shrine of St. Wulfstan has been laden with the offerings of the wealthy and the great; and these solid pictures in stone testify to the æsthetic taste and skill displayed in bringing this cathedral to its present form. Owing to additions and restorations the edifice does not present the ancient appearance one might have expected to find in a building dating so far into the past. Standing on the north side and looking eastwards, the first Gothic portion is seen—most of it standing on the same ground as that occupied by the earlier choir previous to the falling of the tower in 1175. Directly opposite us a beautiful specimen of Decorated is seen in the tower erected in 1374, and the western division is diversified from all besides. In the interior, while there is much Early work, there is more of the Decorated period, and specimens of the introduction of Perpendicular Gothic abound. Passing round the west front to the south, the cloisters, refectory, &c., break the view. The beautiful Edgar tower is now used as the chapter library, and contains some important documents that add much to the interest of the archæologist. Entering the nave, of ten bays, portions of earlier work are seen in the two western bays and other parts; the Decorated composing the greater part of the north, and the Perpendicular the south side. The nave was vaulted by Bishop Cobham between 1317—27, and groined by Bishop Wakefield in the latter part of the same 14th century. The present flooring was laid in 1748. Looking towards the eastern division the choir of five bays, and the retrochoir of three bays, present a magnificent sight of Early English work, divided from the nave by great tower and the main transepts, which themselves deserve careful attention. Passing from the nave into the cloisters they will be seen to be of Perpendicular date. The adjoining refectory, 120ft. long, of the Decorated period, is now used as the King's Schoolroom, and below it is cellarage of earlier work. Re-entering the cloisters to view the chapter-house, a curious architectural contrivance is seen in the central shaft and vaulting ribs, of semi-circular form, springing from it to terminate in side shafts. The plan of the interior is circular, divided into ten bays, but the external view, in consequence of the buttresses, has the appearance of a decagon. Noting in the cathedral the triforium, clerestory, chapels, and chantries, we descend into the Norman crypt, immediately beneath the choir, where the vaulting, semi-circular arches, numerous shafts, though not of the huge dimensions usually employed, and their peculiar abaci and bases, all speak of an existence dating back nearly eight centuries. It was clear that the taste of the men from the Norman abbeys was urged upon the venerable Saxon Bishop Wolfstan II., who was compelled to rebuild this church, as they saw in this crypt. But this Norman influence was but the prelude of the coming glory of the chiselled stone, of the truly English style, of which they had seen a fine specimen in the chapter-house. The desires for new forms of beauty developed the marvellous Pointed style, of which the eastern portion of the cathedral was one of many fine examples. The Pointed style did not wane, but passed into a new form of Decorated, so well exhibited in the north side of the nave and the windows in the west front; the refectory adds its important portion, while the stately tower rises to proclaim the heights of beauty now achieved. The various details have undergone a change, but it is one of additional refinement, and in keeping with the highest taste,—the florid tracery, shafts, capitals, mouldings, all speak to the graceful touch of advancing art. The Perpendicular next appears, but it is a question whether this is an improvement or not. Although there is much that is pleasing to gaze upon, signs of decay are presented in the depressed arches, superfluous fan tracery, unnatural foliage, and flat mouldings. This style of right angles will be seen in the south side of the nave, as also in the cloisters and pulpit, the chantry of Prince Arthur giving a more complete idea of its beauties that reached their perfection in the reign of Henry VII. We have now viewed the various features of this cathedral, the productions of a Christian age, and contrasting as they do with the architecture of heathen temples. Some critics who deserve to be regarded have given way to a little feeling in this matter, and have spoken in unmeasured terms against our so-called Gothic architecture. Suffice it to say that our old churches and cathedrals are the best evidence that can be brought to bear against their observations. We may look upon the Grecian temple and admire the harmony of its different parts; but while we observe its beauty, we recognise its low appearance and repetition of forms. When we glance upon our English church architecture, we behold a richness, variety, and degree of fitness for a sacred structure in which the multitude might luxuriate with the fondest delight, and join in the chorus of praise that so great an effort of the human mind should have been so signally rewarded by these pictures in stone.

SOUTHWOLD CHURCH.

On the occasion of the visit of the British Archæological Association to Southwold, Suffolk, on the 15th inst., Mr. R. M. Phipson, diocesan surveyor, Norwich, read in the fine parish church of St. Edmund a paper, of which we reproduce the more generally interesting portions. Originally, he said, Southwold was but a hamlet to one of the adjacent villages, and the abbot of Bury St. Edmund's built in 1202 a small chapel here. That church was entirely destroyed by fire late in the 15th century, and the present fabric was erected during the reign of Henry VII. Its entire length is divided into eighteen bays, of which six form the chancel, internally simply separated by the rood screen. The demarcation between chancel and nave roofs is externally marked with a sanctus bell-cot, which, although modern, has been constructed exactly on the lines of the old cot. The east window is modern, and I am responsible for its design. I found a wooden east window of carpenters' Gothic character. Beneath the south window are the sedilia and piscina, all plain work, and westward of it the usual priests' door. In the chancel there are remains of stalls and seats, which have been sadly cut about and mutilated, and the pieces are now jumbled in a most incongruous whole. It is, however, perhaps better that we should see them in this state than that they should have been restored off the face of the earth altogether.

The rood or chancel screen and the two side screens, which inclose north and south chapels, are amongst the richest examples of the kind. Many similar screens exist both in this and the adjoining county of Norfolk, such as Attleborough, Eye, Tunstead, Ramworth, Filby, &c., exhibiting more than common artistic excellence, both in drawing and finish, but for elaborate nature and extent of the ornamentation, and the wonderful wax forms, and miniature figures in this screen, some of which have been evidently glazed, there hardly exists a parallel. The central portion of the screen is divided into six compartments, three on each side of the doorway, and these in the lower panels are subdivided, making twelve in all. On these are painted the Twelve Apostles, Christ being here figuratively represented by the door. In several examples His figure is painted on the door itself; this is the case at Houghton-le-Dale, and at Castle Acre, Norfolk. The panels to the side screen of the north aisle chapel, which was dedicated in honour of the Holy Trinity, have the nine orders of the Heavenly Hierarchy, with emblems of the Holy Trinity and blessed Sacrament. These are in an alb of cloth of gold with a green stole crossed, holding children in a white cloth. Similar figures are to be found treated slightly differently at the screen at Barton Turf, Norfolk. This screen seems to have been the gift of one John Gurman, and Catherine his wife, for whose souls an "orate" is still perceptible. He appears to have been a wealthy inhabitant of Southwold; Gardner refers to him, and mentions that he was buried near the pulpit, and to an inscription in brass, which, however, was lost in his time, which also had an "orate pro ānabūs on it." The panels to the screen in the south chapel, dedicated in honour of the Blessed Virgin, have the greater and lesser profits. These, with the other painted decorations of this screen, are much defaced. The figures of Moses and David, and the names of a few of the other prophets are alone traceable. The faces are more or less damaged, but the enriched backgrounds and diaper dresses, and other accessories of the figures are in fair preservation. The enrichments on the screen are stamped in relief on a kind of mastic laid upon the woodwork. This method is of very early use in painted decorations. Enrichments of a similar kind occur on the tomb of Aymer de Valence and Richard Crouchback, at Westminster Abbey. The date of these screens may be safely taken as early in the 16th century. Next in order of decoration comes the chancel roof; and here I have only to show you a reproduction, although I hope and know a very accurate reproduction of the old work, executed under my superintendence by a very able artist, in 1867. I was very reluctant to do this; but the roof and boarding had become so rotten, that there was no help for it. Most of the panels, you will notice, are of a deep blue, studded with stars, but the character of them in the bay over the screen is, as was frequently the case, varied. Here, instead of the representation of a painted heaven, we have angels, alternately bearing a scroll inscribed with the "Benedictus, or Song of Zacharias," and one of the implements of the Passion. The angels are winged, the under and upper feathers alternately red and green; they have crowns of gold on their heads, are all clothed in white, and are represented as rising from the clouds. Some of the implements of the Passion are curiously shown. One has a lanthorn, another a sword, with the ear of Malchus adhering to it; and by the side of him, on a stool, a cock. The mouldings are all highly illuminated, and the cornice has a portion of the "Te Deum" inscribed on it.

The nave roof is a very fine specimen of open-timber work; I was in 1866 obliged to have the whole of it taken off and reframed, as it was in a very bad state: however, many of the old timbers remain; about two of the carved spandrels are old, but the rest are modern. The angels were all headless and wingless, having been cut down by Dowsing, who committed much havoc at Southwold. I am also answerable for the restoration of the clerestory windows, and the stone corbels to roof, as well as the parapet on the north side of the nave, which was never completed by the old builders. The nave is separated from the aisles by six very elegantly proportioned piers and arches. The arch into tower is of considerable beauty and proportion. The font was terribly disfigured by Dowsing. Its panels doubtless contained representations of the Seven Sacraments, and these being peculiarly obnoxious to the Puritans, were objects for special demolition. The representation of the Sacraments on fonts in the Eastern Counties is very numerous, and one occurs at Westhall, close by here. The aisle windows on the north and south sides are all of three lights, with the exception of the east and west windows, which are four-light. At the western angles there are Octagon turrets, which contain staircases reaching to the aisle roofs. There were crosses at the angles of the battlements of these turrets, and it is, doubtless, to these crosses Dowsing refers in his journal, where he says, "he broke down four crosses on the corners of the vestry."

There is a priests' chamber or parvise over the south porch, and in it a very interesting chest, evidently coeval in date with the church. The outside of this porch is a rich mass of flint and stone panelling. The internal roof is groined in stone and has carved bosses at its intersections of interesting character. The tower is very highly ornamented, but the parapet has never been built. The west front is much enriched, commencing with a panelled flint base, and above a second range of panelled flintwork, terminating in a band carved in low relief, with shields and four-leaved flowers, the top moulding being embattled. The belfry windows are peculiar, being divided down the middle with a singular shaft and capital, which continues through the head, and though the ornament upon which it was intended to erect the parapets. They were doubtless carried up in this way with the view of forming pinnacles over them, terminating, perhaps, in figures. On the south side is the newel staircase, which terminates at the belfry floor.

CHIPS.

We have received a handy little apparatus from Mr. Otto Lelm, of Ludgate-circus, called "The Chromograph," for the instantaneous reproduction of documents, plans, circulars, &c. In less than half an hour we have, without a single hitch and without any previous knowledge or practice, struck off forty copies each of a two-page and one-page circular of ordinary letter-paper size, and a shorter circular on the face of a post-card. We could not have written them in less than half a day, and yet the numbers were too few to pay the cost of ordinary printing.

The memorial to the late Mr. Joseph Salter, who took an active part in parochial affairs in St. Pancras, was inaugurated on Tuesday week. It comprises the laying out as an ornamental garden of a small open piece of land at the top of Great College-street, which recently came into the possession of the St. Pancras Vestry after prolonged litigation with the trustees of the Camden estate. Within this garden is a public drinking fountain, of granite, surmounted by an allegorical figure. The works have been carried out under the superintendence of Mr. Scott, surveyor to the vestry.

From the half-yearly report of the Tiverton and North Devon Railway Company we learn that the contract drawings and specifications for this new line have been completed by the surveyors, Messrs. Dymond and Sons, and that as soon as sufficient land has been acquired from landowners, contractors will be invited to tender for the construction of the line.

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ILLUSTRATIONS.

THREE LODGES.—DETAILS OF ST. MICHAEL'S CHURCH, DITTON HALL.—SELECTED DESIGN FOR THE NEW MUSEUM AND LIBRARY AT IPSWICH.—NEW PREMISES, 12 AND 14, OLD-STREET, ST. LUKE'S.

OUR LITHOGRAPHIC ILLUSTRATIONS.

THREE LODGES.

These three lodges are now being built to the entrance to Easton Park, Essex; they are built in half-timber and red brick, and have plain tile roofs. Mr. Thos. E. Collcutt is the architect.

ST. MICHAEL'S CHURCH, DITTON HALL.

We continue our illustrations of this church, of which Mr. Henry Clutton is the architect, by publishing this week a longitudinal section of the chancel, east elevation and plan, and other details. These will readily explain themselves, but we may remark that the arcade of the chancel and nave are of one and the same design throughout, there being no break in the roofs or other distinctions between the two parts, excepting the elevation by steps of the eastern portion of the church. The aisles are covered with high-pitched roofs as shown, the ceilings being executed in plaster, quite flat, with a cornice. We hope to give further details of the tower and west end of this most interesting building.

IPSWICH MUSEUM AND SCHOOL OF ART.

The drawings illustrated are those approved by the committee. On further consideration of them, however, they have determined to alter slightly the front elevation by doing away with the chimney shafts over the side gables. The gables will, therefore, be carried up plain, the plan being arranged so as to allow the chimney shafts to be carried up on the flanks. The central museum will be lighted by a double skylight, and has a gallery running round it at the first-floor level, communicating with the museum over the reading-room and library. The school buildings have had the provisional approval of the Kensington authorities. The building is to be faced with red stocks. The dressings to be of a darker red brick, with moulded and cut and rubbed strings, architraves to windows, panels, &c., and cornices; Bath stone mullions and transoms being used in all the windows. The roofs to be covered with tiles. The rooms in all cases, except in curator's and committee rooms, which will have the ordinary open grates, are to be heated by close stoves; fresh air being provided to all the rooms by Tobin's ventilators next the outside walls, and by shafts in the internal walls, communicating with air-passages under the building. The foul air will be carried off by tubes over the gas sunlights in ceilings. Mr. Horace Cheston is the architect.

STREET FRONTS IN OLD-STREET, ST. LUKE'S.

Our illustration shows a couple of street fronts, consisting of a warehouse and tavern, designed by Mr. Rowland Plumbe, of Fitzroy-square, W. The tavern, which is known as the "Rodney's Head," has a frontage of 34ft. in Old-street, and, with the warehouse adjoining, extends back a distance of 60ft., through to Middle-row. The whole of the ground-floor is taken up by the bar and a workmen's tap-room. The first-floor contains a large club-room. The dwelling and bedrooms are on the upper floors. The kitchens are on the third floor, and communicating with each floor down to basement by means of a lift and serving rooms. The front is built of red brick, the principal architectural features being executed in stone. The roof is covered with red tiles. The warehouse was built some time before the tavern, which it adjoins; it has a frontage of about 20ft. The front is built principally of stone. Both buildings were erected by Mr. George Day, who took both properties on building leases.

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THE EFFECTS OF ARTIFICIAL SCOUR ON THE BAR OF DUBLIN HARBOUR.

In a lengthy paper by Mr. John Purser Griffith, Assoc. M. Inst. C.E., read at the Institution of Civil Engineers, and now published by permission of the council, with an abstract of the discussion, the improvement of the Bar of Dublin Harbour is discussed. The *brochure* before us is edited by Mr. James Forrest, A.I.C.E., the Secretary of the Institution, and will be read with interest by all engaged in tidal works. The paper dwells on the early attempts made to improve the harbour by providing a deep approach to the port. The river channel has been a constant source of difficulty, owing to the necessity of cleansing it. Dublin is situated close to the mouths of the rivers Liffey and Dodder, at the head of a bay 6 miles long and 5½ miles broad. Sand in large quantities was brought into this bay by the sea, which has formed extensive strands, laid dry at low water, and the waters of the rivers referred to, flowing across the sands, had divided them into two sections, known as the North and South Bulls. The channel was subject to constant alterations in form and depth, and attempts were made in 1711 to improve the channel by directing the river in a straight course to the sea, and by dredging, &c. Further improvements were undertaken in the year 1800 by Captain Bligh and Sir T. H. Page for the Directors General, and Mr. Rennie was also consulted. Captain Bligh recommended a wall should be built along the north side of the channel, by which he aimed at confining the waters of the Liffey and Dodder to their channel at all states of the tide, and preventing the dispersion of the flood tide. Sir T. H. Page concurred in the proposal. Mr. Rennie recommended confining the channel by embanking the South Bull and forming a reservoir, making low jetties to direct the water in one course both in the first and last quarter of the ebb tide, when its scouring power is greatest. He next devised a ship canal to afford a permanent deep water entrance to the port, but this met with opposition. Various suggestions were made, but the great cost of the scheme prevented its execution. The construction of the great north wall was at last contemplated, and Mr. Francis Giles was instructed to make an accurate survey of the harbour and bar. He recommended the construction of the north embankment or wall from the Clontarf shore towards the North Spit buoy, but he recommended also an opening should be left at the shore end 600ft. wide to allow of a free passage for the tidal waters north of the Green or Bull Island, a suggestion, however, that had been made previously in 1802. In 1820 the north wall was commenced, and a line was chosen for it that would shelter the harbour and prevent the sands encroaching. It was built chiefly of rubble stone from the limestone quarries on the north side and the Dalkey granite quarries on the south side of bay. The effects of this new wall soon became apparent, and Mr. Telford in 1822 reported that the sand banks inside the wall had been considerably lowered, and the bar opposite the entrance had been lowered 2ft., so that a new and direct channel had been already formed across the bar from 8 to 9ft. deep at low water. Mr. Telford considered the entrance still too wide, and supported Mr. Halpin in the opinion that the embankment should be extended, but that the extension should not be raised above half-tide level until the effects were understood. Telford's advice was carried out, and the north wall was completed in 1825, at a cost of £95,000. Its length exceeds 9,000ft., and it remains much in the same state as when finished. The varying level of the wall forms a remarkable feature in the design; this is intended to give greater velocity to the current at a certain period of tide, and has been adjusted after a thorough knowledge of the direction of the currents "Had the north wall," says the author, "been raised above high-water level for its entire length, there would have been a strong current through the entrance during the whole of the ebb. In that case the current on the first half of the ebb would become a sand-bearing stream, and on meeting the opposing bay current would either deposit sand and form another shoal more difficult to deal with than the bar, or be deflected to the southward and re-enter the harbour on the flood, bringing back whatever sand was held in suspension." In 1835 Sir W. Cubitt reported upon the harbour, and referred to the improved channel over the bar due to the great north wall, which operated upon sound principles, "in checking the influx of sand upon the flood-tide from the North Bull into the harbour, and giving an increased impetus at the ebb tide by means of narrowing the stream and confining it to a direction suitable for keeping open the best channel, the effect of which is shown by an increased depth of 5ft. over the east bar since the erection of the great north wall."

The author, reviewing the future prospects of the harbour, says, "It is evident that the depth of water at the bar is still increasing, and it seems probable that within the next ten years there will be a channel across, with a depth of 18ft. at low water, without resorting to any additional works to gain this end." Should this be realised, the port of Dublin would pass out of the list of tidal harbours. Mr. Griffiths, in conclusion, strongly objects to reclamation within the harbour as well as that without; he also believes any increase in the area of the scouring basin must be undertaken with the greatest caution, and should not be attempted till the maximum results attainable from the present basin have been reached." We fully concur in the opinion that any reclamation within the harbour would to that extent reduce the tidal volume of water, and impair the effect aimed at. The improvements show to our minds also the advantage of embanking upon right principles so as to insure a concentrated ebb by a converging line of channel. Dredging has done much besides scour for Dublin harbour. The discussion which followed, in which Mr. Bateman, Mr. Rawlinson, Capt. Calver, Mr. Abernethy, Mr. Hyde Clarke, Mr. Schoolbred, and others joined, generally endorsed the opinions expressed. The paper is well illustrated by plans and sections of the improvements.

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CHIPS.

It is intended to erect a monument in Lichfield Cathedral in memory of the officers and men of the 80th (Staffordshire) regiment who have died in South Africa.

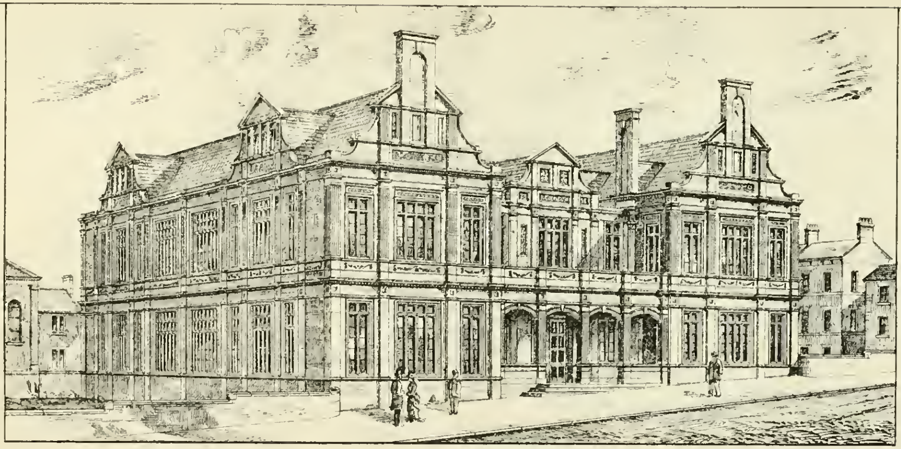
A new church for the East-end of London, to be called All Hallows, is being built by the Ecclesiastical Commissioners in the East India Dock-road. For the purpose of purchasing this site and erecting the church, £9,000 has been set apart from the proceeds of the sale of the materials and a portion of the site of All Hallows Church, Bread-street, City.

The classes of the Herne Hill Science and Art Schools have been removed to larger rooms at the Angell-town Institution, Brixton. It is proposed to organise popular lectures on scientific subjects, and to hold an exhibition of students' work in art early next year.

The sanitary authority of Kingsbridge have accepted the scheme prepared by Mr. Wallace Peggs and Mr. Catley for the sewerage and outfall works for the towns of Kingsbridge and Dodbrook.

A new music-hall is about to be built in Market-street-lane, Preston. Mr. J. Holland, of that town, is the architect, and the estimated cost is £3,000.

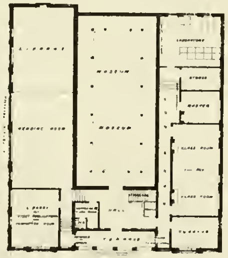
By an accidental transposition of type in the Building News of the 15th inst., a paragraph relating to the discovery of roodloft panels at Ludham Church was removed from the third column of p. 182 to the centre of the following page, where it immediately succeeds the description of St. Benet's Abbey. On p. 232 of last week's issue, second column, fifth line from foot, for memorial to "Dean" Stanley, read "Bishop" Stanley.



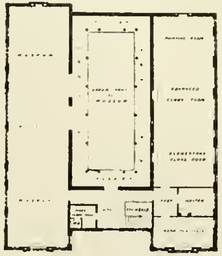
LIBRARY, MUSEUM AND SCHOOL OF SCIENCE & ART, IPSWICH.

SELECTED DESIGN

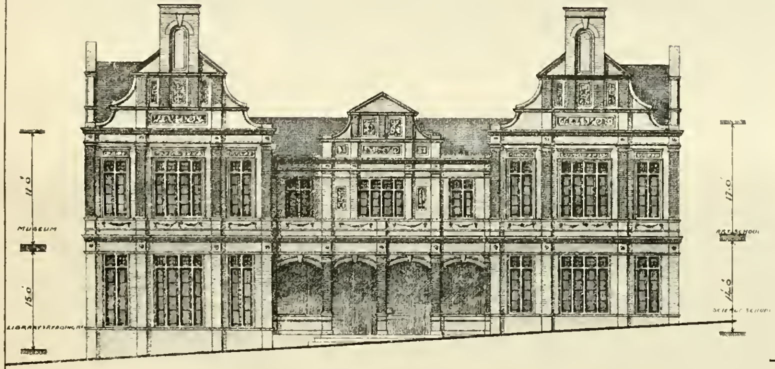
Horace Cheston
ARCHITECT



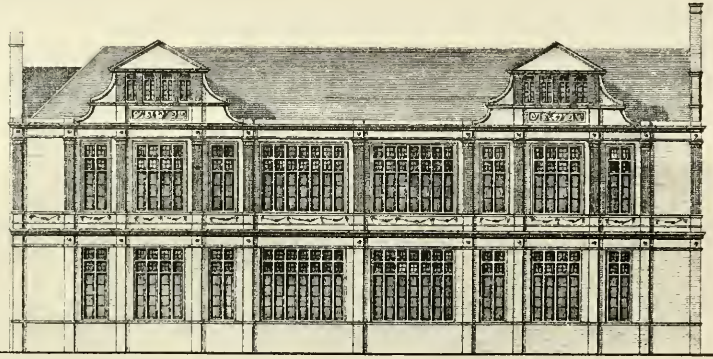
GROUND FLOOR PLAN



FIRST FLOOR PLAN



FRONT ELEVATION

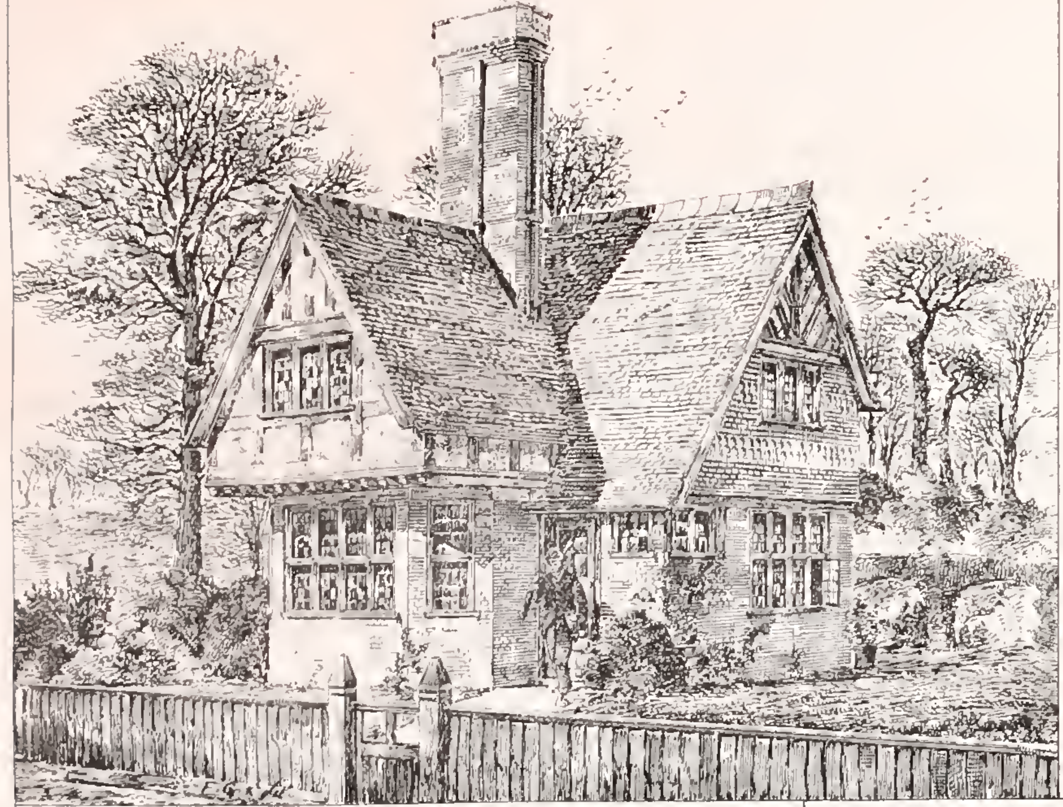


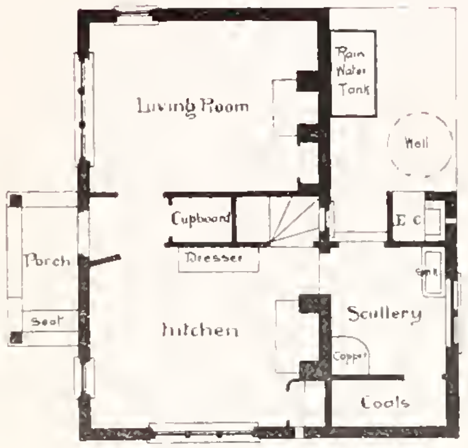
SIDE ELEVATIONS

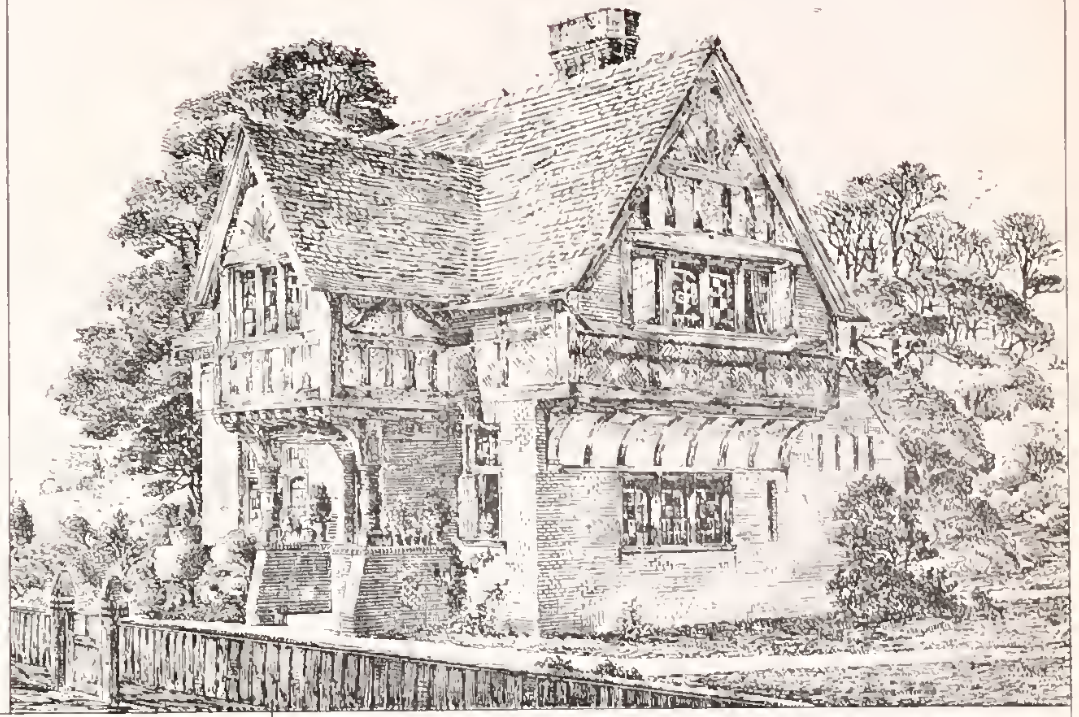
10 5 0 10 20 30 40 50 FEET

SCALE OF FEET

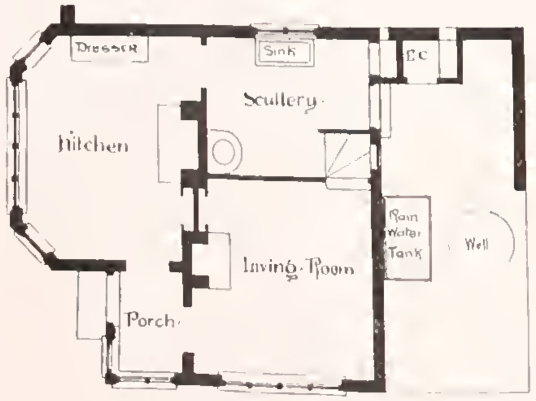
Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C

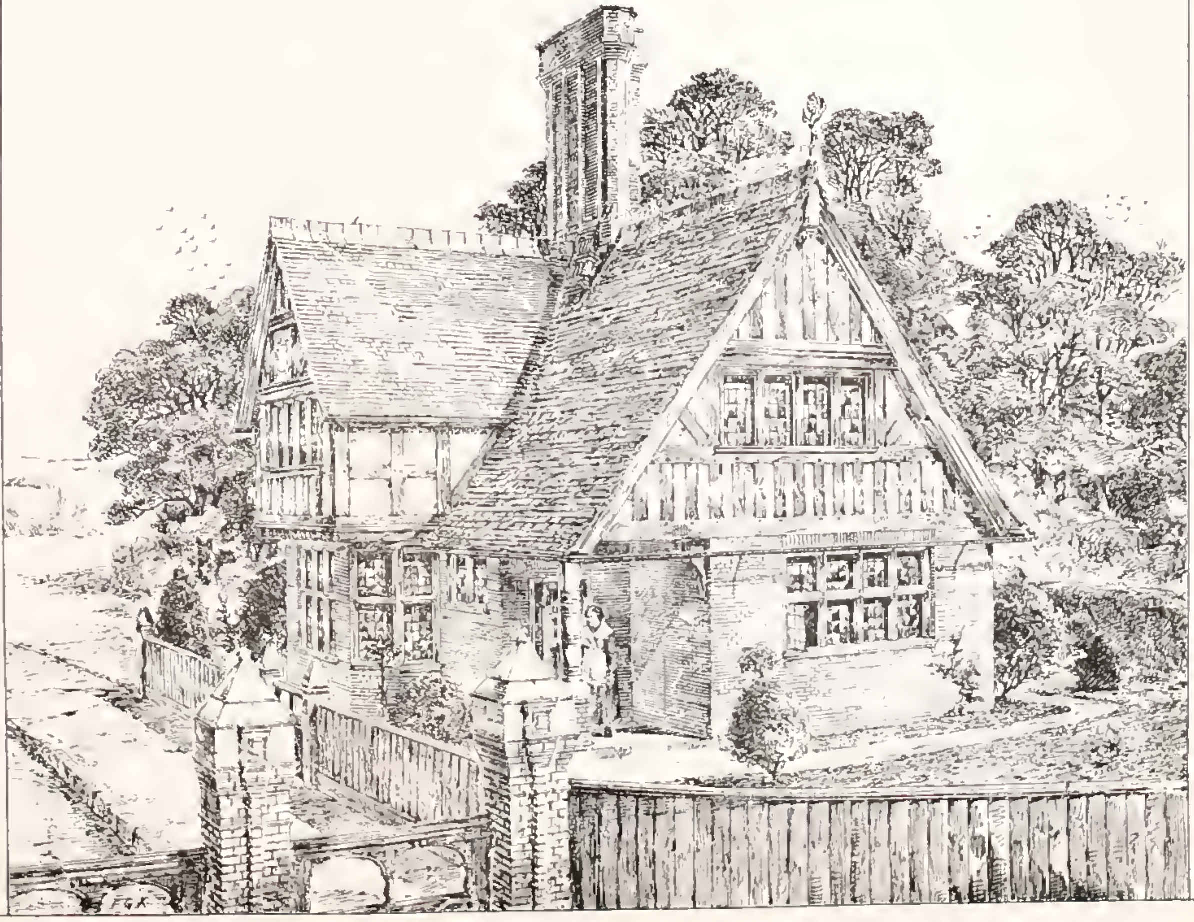




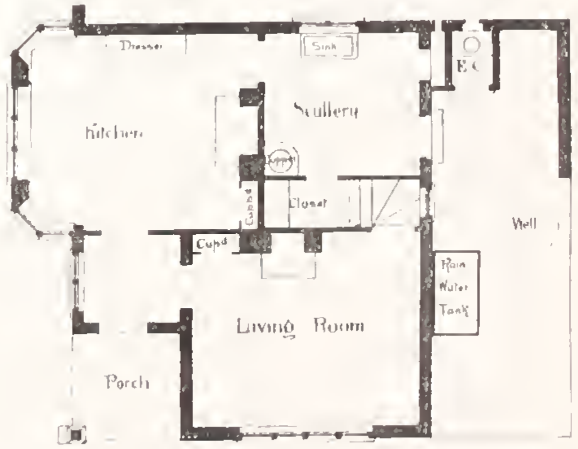


THREE LODGES





Easton Park



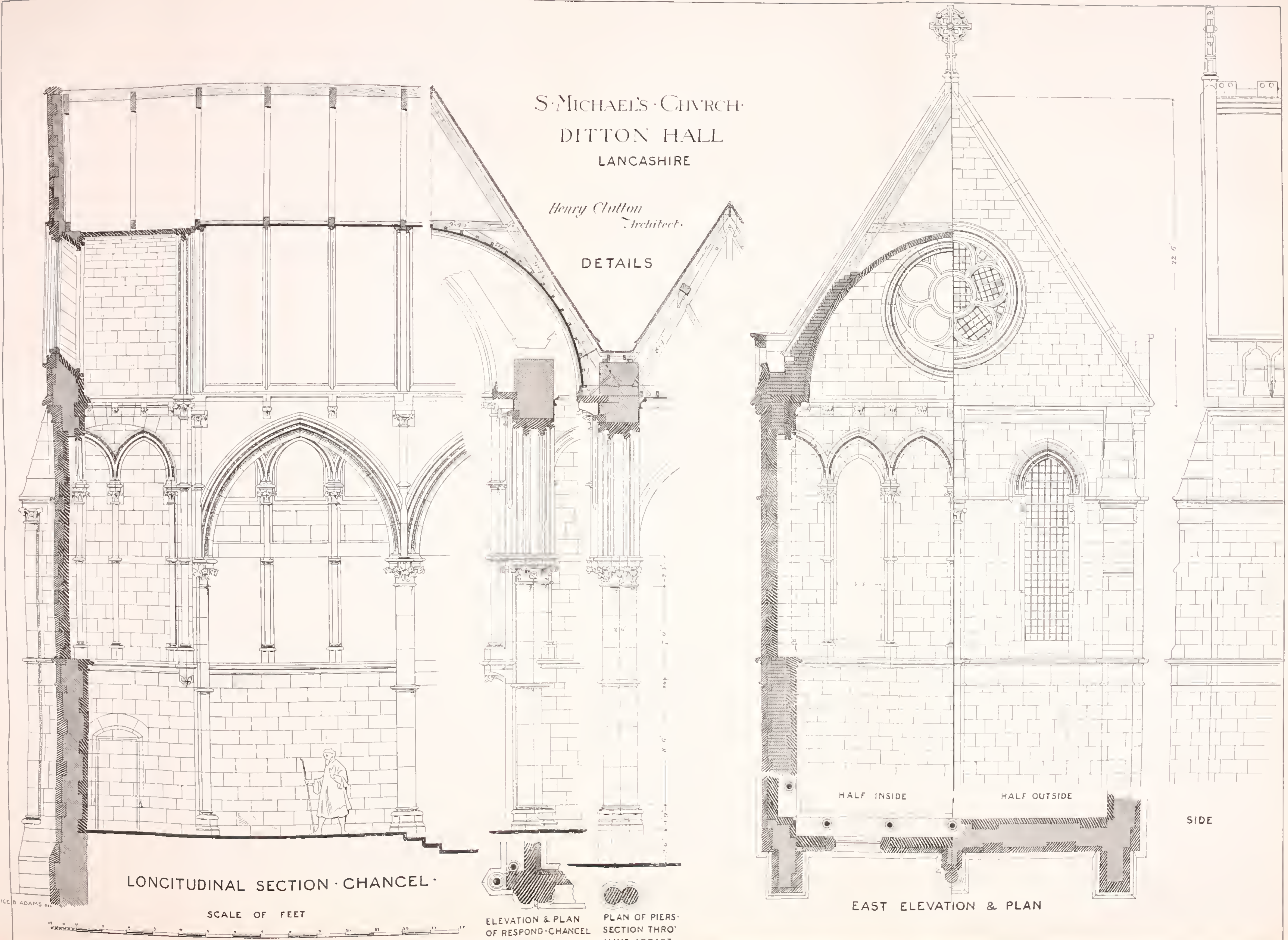
T. E. COLLCUTT F.R.I.B.A
ARCHITECT

Photo Lithographed & Printed by James Akerman 6 Queen Square W.C.

S·MICHAEL'S·CHURCH·
DITTON HALL
LANCASHIRE

Henry Clutton
Architect·

DETAILS



LONGITUDINAL SECTION · CHANCEL·

ELEVATION & PLAN OF RESPOND·CHANCEL ARCH ETC:

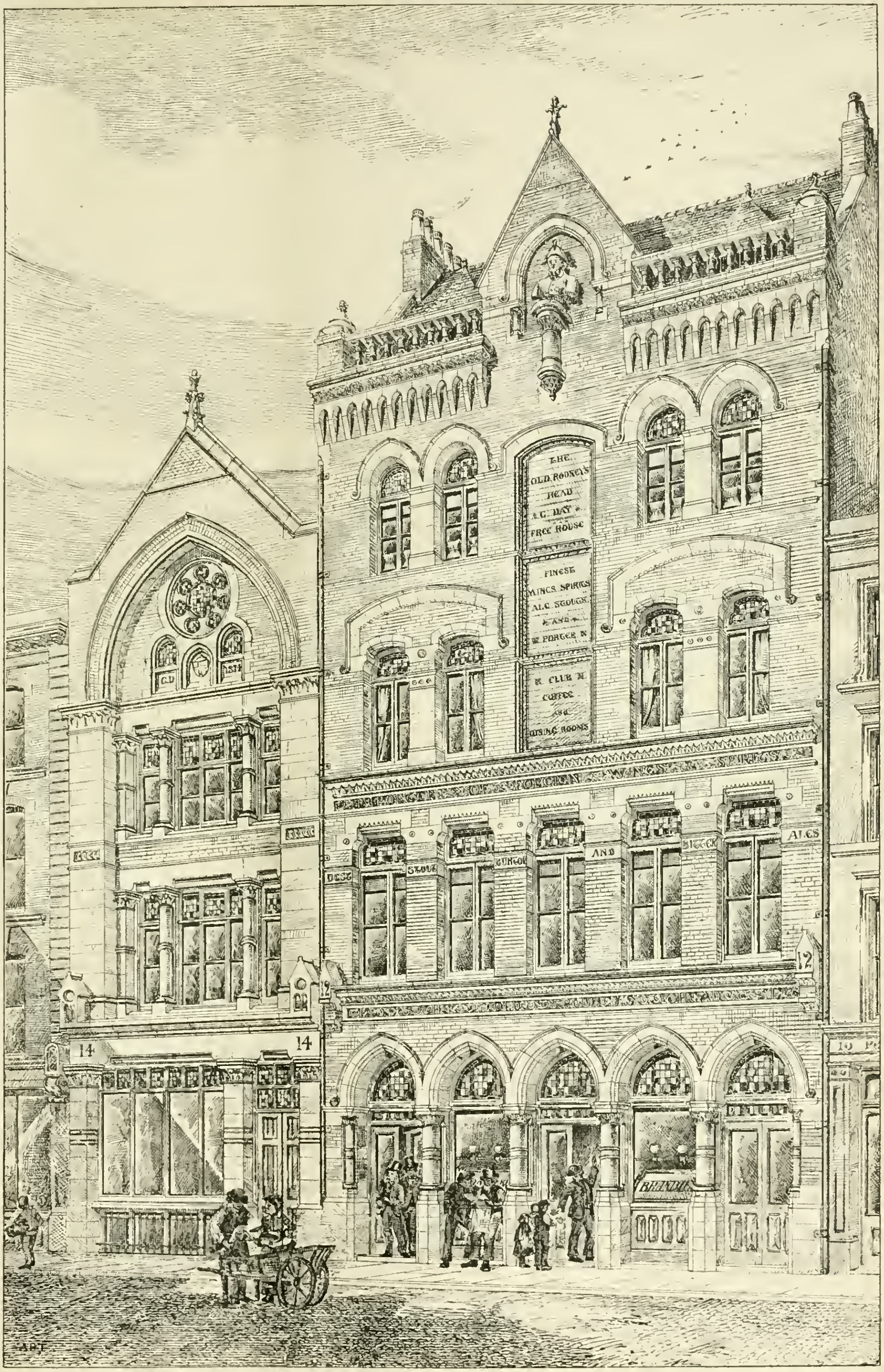
PLAN OF PIERS· SECTION THRO' NAVE ARCADE·

EAST ELEVATION & PLAN

RICE B ADAMS del.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square W.C.

THE BUILDING NEWS, AUG 29. 1879



J. Akerman Photo lith London

Nos 12 & 14 OLD STREET S. LUKES. ROWLAND PLUMBE *Arch!*

BUILDING NOTES IN HOLLAND.

A FEW jottings made in Holland during the past week respecting building matters may not come amiss at the present time perhaps. It is almost surprising that, with the facilities offered, the country of the Netherlands is so little known. A second-class return ticket (*viâ* Harwich) may bè obtained any evening from London for 24s., and, as the homeward journey is made, like the outward one, in the night, a full week is secured away, whilst at the same time one is only out of town a clear seven days. With economy a £5 note will suffice to clear all travelling, hotel, and other incidental expenses, and Baedeker's 5s. "Guide to Holland" gives every possible information that the ordinary traveller will require. Personally I have crossed into Holland sundry and oft, but it is surprising what a deal that is fresh one sees at every successive visit, and how much to please and to instruct too the country contains.

Very fine pieces of engineering skill are the two new bridges across the river at Rotterdam. Upon one of these the railway runs over. It is carried up on six limestone piers, the iron work suspended by convex girders, taking the same outline as do the cylinders upon Brunel's bridge at Saltash; at Rotterdam, however, there are five arcs, at Saltash only two. The line runs over the town upon a continuous iron viaduct, resting, like the bridge, upon limestone piers. A very fine iron bridge for carriages and foot-passengers runs parallel with the railway one. The River Maas here is about as wide as the Thames at Greenwich. The way in which the masons "tool" their blue limestone is beyond all praise. The visitor notices too in what extraordinary lengths it is obtained for the street pavement curbs. We measured some of them 14ft. long by 9½in. wide, and onl y 3½in. deep. These stones are all joggle-jointed together in a clever but simple fashion.

Many new buildings of minor size are going up just now, but nothing of much importance, although the building trade at Rotterdam generally is fairly good. We were sorry to find some quaint old houses—old friends—"improved" off the face of the city.

Less than ten miles from Rotterdam is Delft. The former numbers about 130,000 inhabitants, the latter not 25,000. In the early part of the 16th century the place was all burnt down, save half-a-dozen houses. Still there is a deal of the middle ages' proverbial sleepiness about the place, and the exquisite green the double rows of trees in every street assume just now is charmingly attractive; so, too, are the houses, red brick all of them, and boasting of every conceivable sort of gable. Some of the bridges over the canals, especially at the junctions of streets (there is a canal down nearly every one of these) are cleverly managed. In such positions arches spanning three or four streams going as many ways, are incorporated together in a manner not a little curious. The old church is a 15th century building, with a western tower and spire, slightly out of the perpendicular, but not leaning anything so much as Pisa or Bologna. The spire has a balcony around it half-way up its length, very like the treatment at one of the churches at Bruges. The red brick tracery in this church's windows is interesting, and some delicately-worked wrought-iron finials upon some of the gables are very choice. Inside the building is a sea of whitewash, but we heard an earnest sermon preached in the Jacobean oak pulpit by a Dutch priest, whose voice, by the help of an immense sounding-board of the same material, commanded the audience with ease. It is worthy of remark that many of the male portion of the congregation wore their hats during service. The market-place at Delft, is broad and open, and affords a good site for the other church—an early 15th century one. Facing it, upon the opposite side of the square, is the town-hall, its type about a century later. The church has a noble western spire, from the jambs and mullions of whose bell chamber windows swing the bells. The larger bells occupy one window each, and more are swung to the others in proportion to their size. Within this church, immediately behind the altar, is the tomb of William of Orange, who was murdered in the town. The sarcophagus is in marble and bronze, recalling at first glance Stevens' monument to the Duke of Wellington at St. Paul's. For power of design, and wonderfully clever execution, William's memorial, of the two, I think, carries the palm. The modelling of the four colossal bronze figures, at the four angles, is simply perfection. This sumptuous monument was executed by De Keyzer and Quellyn, in 1621. Close by this church, on ground standing at right angles to it, but divided therefrom by a canal, a superb new church is now erecting. The nave, indeed, is finished, and used for present services; and the chancel has so far progressed, that the roof timbers are being put thereon. It is built, in the main, of brick, stone being sparingly used in the dressings. The style is a sort of Flamboyant. The building is very lofty, and its proportions almost cathedral-like. Several other buildings, of a lesser interest, are in hand at Delft just now.

Only a quarter of an hour from Delft, by railway, or an hour by tram or canal boat, is the Hague. The Hague has nearly 100,000 inhabitants, and contains many fine broad streets, good buildings, and imposing squares and parks. It is at the Hague that the seat of government exists. A large job going on there is the new Palace of Justice. This fine building is in the old Dutch Renaissance style, and is being erected from the designs of Mr. H. T. Peters, architect, of the Hague. It stands well, at a corner of a square and of the main thoroughfare. The scaffolding is now nearly all away, so that, in part, the merits of the design may be fairly judged. Two-thirds of the intended building, however, is only in progress. This portion has been in hand some two years, and will take a like time to complete. When finished, the remainder will be carried out. The builders are Messrs. W. M. Scham and Co., and their foreman, Mr. M. L. Von Spange. To the latter our very best thanks are due for much useful information and kindly attention. The building, in the main, is of brick. The plinths, however, are of limestone. Holland produces little or no stone, and the limestone used at the Palace of Justice comes from Belgium, and is known as Escanzignsche Stun. It is much like our ordinary blue limestone. The dressings generally are of a light brown German stone, known as Udilfanger; this is a pleasant-working sandstone. The exterior is very ornate, both façades exhibiting much carved detail: the heraldic figures sculptured at the springers of the various gables are helped by colour. The ornamental iron ties, so common and striking a feature in Dutch and Flemish architecture, are introduced with good effect. The bricks used (small—8in. by 4in. by 2in.—as all Dutch bricks are) are of a light chocolate colour, and at the main angles twisted stone columns are carried up. The roofs are of steep pitch, and surmounted by a highly ornamental metal cresting 4 or 5ft. high. At one end is a tower, but not of particularly pronounced height above the rest of the building. Inside, is a central courtyard, around which the building stands. In the ground-floor rooms and in the main staircase the roofs are groined in brick. The character of this groining is very much like that in the long passage running from the clergy-house to the nave at Mr. Pearson's beautiful church in Red Lion-square, Holborn. The spandrels in the groins, however, at the Hague are all filled in on a concave line instead of on the flat, as at Red Lion square, and the Dutch bricks, being narrow, are more readily and pleasantly manipulated than our English ones are. The window-casements and doors are all of oak, the floors and other fittings of pitch-pine. The cost of seasoned oak at the Hague is 100 florins the cube yard (a Dutch yard measures 3ft. 3½in.) and pitch-pine 60 florins for the same measurement. A florin is valued at 1s. 8d. English money, so, as there are 35ft. cube, or thereabouts in a Dutch square yard the cost of seasoned oak, is 5s. a cube foot. This is cheaper, than in England—but the pitch-pine is dearer, being at the rate of 2s. 10¼d. a foot cube. The library is a lofty room, lit from above, and has three galleries of iron around it; these are for access to the books. The main staircase throughout exhibits much fine groining, and at the top this is especially a feature, for there the groins spring from the central shaft, much as at the Chapter House, at Salisbury. The cost of the entire building will be about 1,300,000 florins: or over £108,000.

The ordinary wotking hours of the building trade in Holland, in summer, are 71 hours a week. Labour commences at 5 a.m., and terminates at 8 p.m.; excepting on Saturday when the men "knock off" at 4.30. They breakfast from 8 to 8.30; dinner, 12 till 1.30; tea, 4 till 4.30. At the Hague, stonemasons receive the highest wages, and are paid 24 cents an hour (4¾d.); bricklayers, 22 cents (4½d.); carpenters, 18 cents (3¾d.), and labourers, 15 to 17 cents (3d. to 3½d.). Thus, for 71 hours' labour a week, stonemasons receive 28s. 5d.; bricklayers, 26s. 0½d.; carpenters, 21s. 3½d.; and labourers, 17s. 9d. to 20s. 1½d., or at London working time of 50½ hours, stonemasons, 20s. 2½d; bricklayers, 18s. 6d.; carpenters, 15s. 2d.; and labourers, from 12s. 7d. to 14s. 4d. And yet the Hague is just 200 miles from London as the crow flies! We visited this building last Monday, and the comparative fewness of hands at work was accounted for by the foreman, by the statement that many were worshipping at the shrine of Saint Monday!

Many houses in the Hague are being rebuilt. The ground lying so low — no sooner are the foundations dug out than the space fills with water. This is cleverly got out upon the artesian principle. A huge hollow cylinder of wood some 30ft. long, and 2ft. in diameter (and having within it a doubly-rifled screw of wood) is pushed into the basement at an angle of 25°, the upper part projecting into the roadway. Two labourers rapidly revolve this cylinder by the aid of a pole, and the water *falls up*,—if I may use such an expression—in a continuous volume—clearing the basement quite dry in no time!

At present scaffolding envelops a greater part of the Binnenhof, or old Palace and Houses of Parliament. Some of the frontage facing the Vijver (a square of water) is being altogether rebuilt, and much of that towards the quadrangle is now in process of being refaced with brick. This quadrangle is full of scaffolding and building materials; but general repairs, rather than additional or extended works, seem to be what is at present aimed at.

Everybody who visits the Hague goes to Scheveningen, the celebrated Dutch watering-place. It is a little town of 8,000 inhabitants, and is some four miles from the Hague, reached by ordinary train along one long, continuous avenue of trees; or by canal-boat or steam-train. Scheveningen has doubled its size during the last few years, but the houses, although spank and new and trim, have rather a flimsy look about them. Here, upon dunes or sand-hills facing the sea, are four of those immense hotels, of which we have scarcely any parallel in England

Less than a dozen miles from the Hague is Leyden, one of those interesting old "dead" towns, once containing 100,000 inhabitants, but now only mustering a third of that number. Leyden is built upon some half hundred small islands, at one of the mouths of the Rhine, and in it one will find many pleasing points. From the fine tower of the Stadhuis, the bells from the outside — a common Dutch feature — chime pleasantly every quarter of an hour, and in amongst the houses, trees and canals seen everywhere. Leyden is one of the oldest Dutch towns, and it was there that Rembrandt was born. The church of St. Pancras is a good 15th-century building, and from the top of its tower a glorious view of the surroundings is obtained. This church has a deal of stone as well as brick incorporated into its construction. Repairs are now being made on the north side of the choir, and new clerestory windows. Parapets and buttresses are being worked and fixed. The houses that cluster around the base of this, and indeed nearly all Dutch churches, take off a good deal from the lower proportions of the buildings. The church is lofty and has a good interior—cruciform, and with stone-groined roofs to the aisles, and wood ones to nave and chancel. The columns supporting the arcades have bases of 10 cants on plan. The nave only is used for worship. Another fine church at Leyden is that of St. Peter's.

Some eighteen miles further on from Leyden is another "dead" city, that of Haarlem. The great church of St. Bavo there towers up above all else, like Amiens or Cologne, or our own more humble minster church at Sherborne. From its fine central tower the chimes pour out a peal, seemingly every few minutes; and full of quaint interest is the market-place, in which the church, the old town-hall, a queer-looking butchery, and a score of other interesting old houses stand. This church is also under repair. The clerestory windows in the north side of choir are being replaced in stone. A new building is about to be erected in the market-place. The interior of the church is fine; the bases of the columns in the arcades are 7′ 4″ square; and the columns themselves are built in narrow beds, some not more than 5″ or 6″ deep. The building has a beautiful groined oak roof. In the choir is a good old brass lectern, 7′ 3″ high, a bleeding pelican. The parclose and choir screens generally are of oak—Late Gothic in character—the backs of the carved stalls decorated with colour; and the arm rests all terminating with grotesquely carved heads. There are twenty-two quaint misereres upon each side. The choir screen, whilst the framing and lower parts are of oak, is composed largely of brass. The mullions, tracery, and crestings are all in that material. It is charming old work, and, with very many other brass screens in the country, is well deserving notice. The huge columns in the choir are painted on their inner sides with representations of tapestry. In this church, suspended in one of the arcades, are some interesting models of three of the ships that sailed in the first crusade from Haarlem, under Count William I. In the south corner of the west end, some oak seating with linen panels well deserves attention. In the choir the stonework has been denuded of the whitewash, but the rest of the church is white as driven snow. This church has a central tower, and the aisles are stone groined.

It may be here noticed that stoofjes, or wooden foot-warmers, are to be seen in this, and indeed, all the Dutch churches by the hundred. The ordinary ones are wooden boxes some 8in. or 9in. square, minus one side, and with five 1in. brace-bit holes bored through the lid; a little pan of live charcoal is put therein, and the feet placed upon the top. The old market-women of Bedfordshire used to do somewhat similarly, certainly until within the last few years. Some of the *old* Dutch stoofjes were very elaborately carved. I have had an old one in my possession for years measuring 10½in. by 9in. by 8in., carved pleasantly with diaper; it is late 16th century work. There are four new houses building in a street facing one of the bends of the river Spaarne, and some other new buildings are in progress.

Ten or a dozen miles from Haarlem is the busy capital of Holland. Amsterdam has a population of nearly 300,000. Its principal centre is the Dam—a goodly-sized square in the middle of the city. Here is situated the palace, the finest stone building in Holland, a square five-storied place, with a central tympanum filled with sculpture, after the fashion of that over the Royal Exchange in London. The Dam is a finer commercial centre than the Royal Exchange, or indeed perhaps Trafalgar-square, or College-green, Dublin, all of which well-known corners, however, it somewhat resembles. The principal church is close by. It is Decorated work, the arcade columns, not round as generally found in Holland, but clustered; the roof is a barrelled one of oak (groined at its central part), and having huge oak tie-beams bearing upon great oak struts carried by vaulting shafts. It has a double set of aisles to its choir, all beautifully groined in stone. The clerestory windows, as usual, are very large and fine. The choir screen is entirely of wrought old brass upon a marble base, some 40ft. odd wide and 15ft. high. The two brazen doors to the screen are 6ft. wide. The stalls are all oak and Jacobean, dated 1620. At this church is the best pulpit I know in Holland. It is of goodly size, made by one Albert Vincken Brinck in 1649; his name is on its door. The diameter of this pulpit is 5ft. 5in., and the panels recess 8in; the actual thickness of the pulpit is 1ft. 6in. The sounding-board, like the pulpit, is hexagon; its diameter is 24ft., and it towers up 60ft. or thereabouts. This pulpit contains some excellent work, and is altogether unlike the summer-house-looking ones in the neighbouring country of Belgium. A very good church is the Oude Kerk, not far off the main part of the city; in it is a very large interesting heraldic window, bearing the arms of all the burgomasters from 1578 to 1767, and other things worthy of notice.

The steepness of the staircases in the old houses at Amsterdam is astonishing, and it is altogether a mystery how the good folks contrive to run down them. They are as perpendicular as an ordinary ladder.

The little town of Gouda, containing some 16,000 inhabitants, lies between Amsterdam and Rotterdam. A very fine R.C. church has been building there for the last eighteen months, and it is intended to open it the beginning of October. It is situated in the Kleuvey, its west end abuts on the street, and upon the south side of this end a priest's house is attached. The whole is built of red brick, with the very sparing addition of a little stone. The style is a sort of Early work; but the priest's house has more of the local character of Dutch or Flemish domestic work about it. The two harmonise and group very well together, however. The western porch, over which it is intended ultimately to place a lofty tower and spire, is of deeply-recessed cut brick, and is prettily groined in the same material. The tiles laid in this porch are 12-in. and 6-in. ones, black, red, and grey, from Brussels. The tracery in all the windows is of worked brick. The church has a nave and two aisles, transept and apse, and a four-step rise to the altar. The arcades are of brick, and the groining in the aisles is in the same material. The nave and transept roofs are of wood with painted ribs, green, yellow, red, and gold, on a white ground. The walls and bases of the columns are cemented. The floors are laid with deal boards. The seating is of teak, framed up with pitch pine panels. The bench ends are framed, and not pleasant in design, being very cabinet-maker-like. There is a peculiar arrangement in these seats. They are so formed that the congregation, by lifting each seat and book-board, may reverse them, and sit facing due west instead of east. The architect is Mr. Bleys, of Hoorn, near Amsterdam; and the builder is Mr. Leibrands, of the latter city.

One wonders when will the scaffolding be taken away from the charming main front of the Gouda Town Hall? This interesting isolated building, in the market at Gouda, has now been covered with scaffolding for several years, and, save that a few pinnacles have been taken down, nothing has been done!

The Groote Kerk at Gouda is a gloriously fine 16th Century church, with a long continuous roof from east to west, and containing a wealth of stained glass.

But this paper is already far too long, and the dim unsteady light of the cabin-lamp of the steam-ship *R. Young* suggests its curtailment; therefore, now, no more must be said; but surely enough has been written to give a zest to many a reader seeking a change to try for additional information ere the short summer goes away by a run in the land of the Dutchmen.

Harry Hems.

THAMES CONSERVANCY REPORT.

THE general report of the Conservators of the River Thames for the year ending December 31st, 1878, has just appeared as a Parliamentary paper. It contains few matters of interest, though it holds out some prospect of a thorough investigation of the effect on the river of the discharge of the sewage of the metropolis into the Thames at Crossness and Barking. It seems that, as a result of the correspondence between the Conservators and the Metropolitan Board of Works, respecting the deposits near the sewage outfalls, an arbitrator has been appointed by each board under the provisions of the Thames Conservancy Act of 1870, and the Board of Trade has been requested to appoint an umpire. "The Conservators," the report states, "trust that the important questions raised by this correspondence may now be thoroughly investigated and settled."

Another subject alluded to in the report is the extension which has been obtained, under the Conservancy Act of 1878, in the jurisdiction and powers of the conservators with reference to the purification of the Thames and its tributaries. The district under their control now extends to a distance of ten miles in either direction from the river. This is an important point to the smaller towns situated in the Thames Valley, and an early use of these newly-acquired powers has been the issue of a notice to the Brentford rural sanitary authority, calling upon them to abate the nuisance caused by the discharge of the sewage of Hanwell into the River Brent. We learn from the report that, with the view of carrying out the additional powers of the Board, two officers have been specially appointed to inspect the river and its tributaries above the western boundaries of the metropolis.

On the subject of the Oxford Sewage Works, we read that they are still incomplete, notwithstanding the pressure brought upon the local board by the conservators, who receive constant reports from their officers as to the state of progress of their works, which they are assured will be finished in the course of the year. When this has been accomplished, we are given to understand that the works for diverting sewage from the Thames, above the intakes of the water companies, will be complete.

ASPHALTE, AND ITS APPLICATION TO STREET PAVING.*

By E. B. Ellice-Clarke, Assoc. M. Inst. C.E.

(*Continued from page* 151.)

PREPARATION OF BITUMEN AND MASTIC.

THE powder and pieces of rock are placed in cauldrons filled with boiling water and stirred for an hour. The stirring breaks up the rock, and the bituminous portions float; the sand or calcareous stone being partially precipitated. The bituminous scum always contains about 25 per cent. of sand, to eliminate which a second process has to be gone through; though in some of the coarse-grained rocks, as those of Lussat, Auvergne, the scum is sufficiently free from the sand, and does not require a second process. The scum is again heated in water, which is converted into steam. By this second purification all the sand is eliminated; the pure bitumen floating on the surface. This is decanted into iron moulds, the weight when cold being about ½ cwt. This method of extracting the bitumen is not much practised, as the Trinidad bitumen is cheaper and serves the same purpose.

The Paris engineers specify that the stone from the Seyssel mine used for making mastic shall be naturally impregnated with bitumen of good quality coming exclusively from the mineral stone. All artificial bitumen extracted during the purification of heavy shale oils is rigorously excluded, the rock is to be soft and fine-grained, and the texture compact, regularly impregnated with bitumen so as not to show black and white spots, which would indicate that the limestone and bitumen were not thoroughly mixed together. The colour should be brown, when heated to 60° C. it must fall to pieces, and contain 7 per cent. of bitumen, 93 per cent. of limestone, and not more than 9 per cent. of free bitumen must be required to mix with it, to change it to mastic.

The different mines mould the mastic into various shapes being their trade marks. The hexagonal block of the Val de Travers Company is the most convenient for storage.

These blocks are broken into pieces, placed in cauldrons, and heated to a temperature of between 380° to 490° Fahr.

When the temperature is increased, the bitumen wholly evaporates; if the limestone is made red hot it becomes pure. If, however, a small quantity of free bitumen is added, the whole melts, and a complete transformation of the material is effected.

Rock containing but 5 per cent. or 15 per cent. of bitumen will not melt; if there is added from 7 to 8 per cent. by weight of free bitumen, the former will melt, though it will not be so rich in bitumen as the latter. After it has become cold it will not again melt without the addition of bitumen, so that free bitumen acts as a flux. In the preparation for laying there is added to the mastic about 60 per cent. of grit; silicated grit is the best, it must be quite free from loam or other foreign material. The quantities generally used are

Bituminous mastic	220 lbs
Free bitumen	13 ,,
Grit	132 ,,

River ballast thoroughly dried, passed through a 3-16 in. sieve, or other similar material, is used for grit.

The mastic is thrown into the boiler; when the first lot is melted a small quantity of free bitumen is added, and the mixture is stirred with an ○-iron, about 5 per cent. of the total quantity is added at a time. At the third charge some gravel or grit is added; this sinks by gravity very slowly, owing to the specific gravity of the materials being nearly the same. The mixture is not moved until the grit disappears when it is stirred rapidly; the mixture continues in this way until the cauldron is full.

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* Read at the annual meeting of the Association of Municipal Engineers and Surveyors, August 1, 1879.

Care must be taken when the boiling is complete the mastic is not too dry; if it is, a small quantity of free bitumen is added.

The boiling occupies from two to three hours.

The method of testing the complete boiling is by plunging a piece of wood into the mixture. If it is insufficiently boiled the mastic adheres, and *vice versâ*. It should be observed that grit is added not from motives of economy alone, but to prevent the mastic, when laid, softening by the heat of the sun. The two chief points aimed at in the preparation is to heat the mixture with as little free bitumen as possible, and to lay it as hot as practicable.

Mastic is principally used for footpaths; in England it has completely failed when subjected to the heavy traffic of the London carriageways, and has been replaced by compressed. If a piece of old mastic is examined, it is apparent that the cause of failure is the admixture of grit. The surface will be found covered with indentations, from which the grit has been removed. These sockets give way round the edges, and forming so large a portion of the bulk, the whole soon becomes disintegrated. The same remark holds good in its application to foot pavements, only the percussion from traffic being much less, it wears longer. It will be seen that the use of material other that the natural rock opens the way to adulteration, unless the engineer sees every portion of grit placed in the cauldron he can never secure a constant quantity being used; it will therefore be necessary to mention under the head of Maintenance how this evil is to be guarded against.

The laying of mastic is simple; while in a boiling state it is laid in strips about 4ft. wide on the concrete bed with wooden floats or spattels. From ½ to 1in. is the general thickness laid. One man, with the asphalte brought to him, can spread 150 yards super in a day. Three tons of the material can be prepared by a workman in a day. The concrete is usually 3in. in thickness, and laid to a fall of 1in. in 24.

DURABILITY OF COMPRESSED ROADWAYS.

M. Chabrier states that the effect produced by wear and tear on asphalte is so trivial that it may almost be said to be imperishable so long as no other cause than friction of wheels occurs to alter its working conditions. It is hardly possible to accept such a statement without challenge, and the wear is unquestionably so slight that exaggeration is not necessary, even by partisans. The most lengthened experience in England is in the piece of road laid by the Val de Travers Company in Threadneedle-street in May, 1869. In February, 1877, the City engineer reported this piece of paving as having had few repairs, and being in good condition. The author examined it a few weeks ago, and, with the exception of those places cut out for experiments and gas or water repairs, the surface was in good condition; it has been subjected to a traffic of 200,000 tons[*] per annum per yard of width. Unfortunately for the statement just quoted from M. Chabrier, the pavements of all cities are subject to many other incidents tending to destroy them than mere friction of wheels. The constant removal of the surface to repair gas and water mains and drainage is such that in many streets 50 per cent. of the whole surface will be removed during the life of a pavement.

Rock asphalte is compressed without appreciable wear under traffic such as the above. On the table is a specimen taken from Cheapside. It was laid in December, 1870, 2¼in. in thickness. After having been subject to a traffic of upwards of 500,000 tons per annum per yard of width, the bulk is reduced 5-18th, while it has lost 2-7th in weight. The difference in the percentage of loss of bulk and weight is accounted for by the compression of the material. This is apparent to the depth of half an inch. Under a magnifying glass the compression can be seen to the depth of more than 1in. After fifteen years' wear and in the Rue Bergère the loss by weight was 5 per cent. In Gracechurch-street, where the traffic is 603,000 tons per annum per yard of width, the material has lost but inconsiderably, either in bulk or weight, during a period of eight years. These results are all obtained from the compressed rock of the Val de Travers. When other materials in mastic have been laid in streets of much less traffic, they have been replaced either with compressed or wood; and without making invidious distinctions, it may be here stated that experience in London has demonstrated the fact that no class of asphalte has stood equally well with that of the Val de Travers compressed. From 1870 to 1878 thirteen different kinds of asphalte had been tried in the city of London. At the period of writing but three remain, in streets having traffic of more than five hundred vehicles in twelve hours. The manner in which the compressed rock is laid has much to do with its duration; disintegration has taken place in many roads from circumstances that are not readily accounted for; fissures appear on the surface, so close together as to form a complete web-like appearance; the percussion of the horses' feet detach small portions of the material and if frost supervene the road will quickly fail, owing to the crystallisation of the water held between the fissures. It has been urged that this is occasioned by the execution of the work during wet weather. When the heated powder is placed on a wet surface, vapour of water is produced; this permeates the powder below the bulk influenced by compression, and it will be readily understood these prevent the perfect homogeneity of the whole. Another cause of failure is owing to the cracks being produced by the use of too new a cement for a foundation. When the concrete fails, the asphalte will fail also. The question of durability, apart from other considerations of convenience, is the question of cost. It is therefore necessary to compare this with other materials.

The cost is reduced to 100,000 tons per annum per yard of width.

Description.	Original Cost per Square Yard.		Interest on Original Cost	Sinking Fund at 3 per cent. Compound Interest	Maintenance per Square Yard.		Scavenging per Square Yard.	Total.	
	s.	d.	d.	d.	s.	d.	d.	s.	d.
Wood (Liverpool)	15	1·5	7·5	10·1	0	1	2·7 Gravel 5 0	2	2·3
Val de Travers compressed asphalte	18	0	9·7	..	0	3·6	0·4	1	1·7
Granite	17	9	9·6	0·5	0	1·3	2·5	1	1·9
Macadam	4	9	2·1	..	3	6	12·0	4	8·1

It will be observed that nothing is charged for renewal of asphalte, inasmuch as the annual sum for maintenance provides the asphalte in perpetuity. In Paris 1-15th of the entire roads paved with asphalte are renewed every year at a charge of 8d. per square yard; but there are no precise figures whereby to reduce the cost to the above standard, as this sum includes many roads having very small traffics. In London the Val de Travers Company maintain various streets at fixed sums per annum, from which the figures in the table are arrived at. The figures for wood are those of Mr. Deacon, which the author believes are the only figures reduced to the standard that can be relied upon, all the observations of engineers in New York, Paris and London, confirm these, although not reduced to the same data.[*]

From Colonel Haywood's reports it would appear that the average duration of wood pavements in the City is three years. The following will show the life of some recently laid:—

	Yeara		Years.
Gracechurch-street	1½	Aldersgate-street	3
Great Tower-street	3½	Angel-street	3
King William-street	2½	Ludgate-hill	3½

With regard to the absence of foothold for horses the observations made in London prove that asphalte is not so slippery as granite cubes. It is now well known that when the atmosphere is humid the fine dust and dirt, ever present in a city street, are spread over the surface of the ashpalte by the traffic, forming a pellicle, which renders foothold difficult. In dry weather the road is also covered with the *detritus* incidental to great traffic, apart from wear. When asphalte is swept as a method of cleansing, this adheres to the surface, and becomes greasy mud with a very slight shower of rain. In Paris grit is thrown down on such occasions; but the proper method of cleansing asphalte is by hydraulic and not mechanical means. With fire hydrants on each side of the roadway this could be effected at slight cost. Hitherto this has not been done in London, as there were no hydrants, but in cities where hydrants are in use the difficulty would be solved. Asphalte, either wet or dry, affords an excellent foothold. Trials of asphalte on a small scale, are not to be relied upon. No trial can give a fair result unless a considerable area is paved. It was abandoned in Manchester, where only 968 yards super were laid; but has remained in Southampton, where 1,587 yards were laid in 1873. In no case should a length of less than 440 yards be laid. Horses do not become used to the surface in short lengths, and unless the adjoining road is paved and kept clean asphalte will be not only dangerous but costly. The maximum foothold for horses will not be attained until every street in a town is paved with the same material.

MAINTENANCE.

Hitherto in England the maintenance of asphalte paving has formed part of the original contract of construction. Engineers appear to have thrown the responsibility of repairs upon the contractors, because want of experience did not justify them in taking over the roads when once completed, and waiting results. So far as the author can ascertain, only one engineer, Mr. Lemon, reported against a fixed annual sum for maintenance. In London the prices vary from 3d. to 1s. 6d. per yard per annum. These prices are based upon the cost of granite maintenance, and in many cases are probably too much, while in others they are too small. The periods for which the maintenance is contracted vary from ten to seventeen years, at the end of which time the pavement is to be as good as when first laid. Whether this is an economical method of maintenance cannot yet be determined. In Paris, where the original contracts have long expired, the work is let for seven years, and the contractors have to renew 1-15th of the entire areas each year; the life of the pavement is thus fixed at fiteen years. As the application of asphalte is increased, this method will probably be found more economical than that previously alluded to, and experience will prove what areas will require renewal. To state broadly that 1-15th of the asphalte must be renewed, appears a random method of determining the needful repairs. Each street should be treated on its merits; thus Cheapside would require much more frequent renewal than George-yard, and the two should be kept separate. Maintenance of road by contract has dropped into disuse in this country; but will have to be resorted to for asphalte works.

It is therefore necessary to determine when a street requires renewal. The surfaces must be replaced when there are cracks 1-16in. in width, or there are holes ⅜in. deep; or when there are depressions in a circle of 3ft. 3in. diameter, the normal depth of the hollows being at least 1¼in.; or when the water in the channels cannot be freely discharged, and when the joints or partings from the curbs or other paving stones are ⅜in. wide; and when the surface is blown up or lifted 3-16in. above the adjoining surface. These defects if not repaired, will subject the contractor to a fine, according to a scale of areas and depths. With regard to the repairs to trenches, they must be paid for as new work. In the City of London, immediately the excavation is filled, the concrete is laid, and in a few hours the powder is com.

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[*] These weights are approximate, and probably considerably under the actual weights. Each vehicle is taken to weigh 1½ tons, probably 50 per cent. might be added to them; but, as there are no means of ascertaining the weights exactly, Colonel Heywood has never given weights in his reports, so that in comparing these figures with those given by other writers the vehicles must be reduced to the standard of 1½ tons weight each, and the traffic is for twelve hours only each day.

[*] See Appendix, p. v. to Report of the Paddington Vestry, 1878; Report of Colonel Haywood on Wood and Asphalte Pavements, 1877; Report of Mr. Van Nort, of New York, December 17, 1874.

pressed. Within the past month portions of the roadway have been opened and closed within twenty-four hours; this may be insisted on in streets of great traffic; but, for reasons previously stated, the asphalte can never obtain that firmness over such trenches as it does when the concrete is dry. In Paris a maximum period of fifteen days is allowed; while the trench is becoming consolidated the surface is kept up with flints. Probably the most convenient mode of maintaining the asphalte would be by schedule of prices; the engineer giving directions which portions are to be relaid. The only difficulty would be when the contract expires. Under the previously described mode, the entire surfaces are to be in good condition; this compels the contractors to execute good work, the methods of preparing mastic asphalte and the different qualities are so variable—this gives such opportunities of fraud—the engineer will have to be thoroughly conversant with the details, and exercise a rigid supervision over every process, as well as to sample frequently the natural materials. For these purposes the French engineers have prepared elaborate specifications, to which reference can be made.*

One of the greatest inconveniences in a city of great traffic is the renewal of a road. This work frequently closes a street for a fortnight—with granite in Cheapside this occurred once in about nine years—with wood the nuisance and loss has been intensified to a degree that cannot be tolerated—with the compressed rock of the Val de Travers, a street never need be closed for a day for such work, Cheapside having been done nine years without the traffic being stopped an hour for road repairs.

CONVENIENCE—SANITARY.

The advantages of paving streets with a smooth, impervious surface are so great that no one can contest the point as to cleanliness. The results from actual observation give:—

Material	Superficial Yards for each Load of Mud.	Traffic in Tons per Annum per Yard of Width.
Macadam	344	25,000
Granite	500	50,000
Wood	1,666	25,000
Asphalte	4,000 †	500,000

As dirt means mud in wet weather and dust in dry weather, the same proportions hold good when considering the question of dust. The asphalted streets in London are never watered; streams of water are sent down the channels where dust collects.

ABSORPTION OF FILTH.

No positive statements founded on facts have ever been placed on record as to the actual amount of filth absorbed by different classes of pavement. The only fact recorded is patent to the eye, and is disputed by none, that whether other materials do or do not absorb filth and moisture, asphalte does not. Opinions only founded simply on general observation, and to be taken for what they are worth, place the materials in this position as to absorption:—

Macadam—1. Wood—2.
Granite—3. Asphalte—4.

FREEDOM FROM NOISE.

This desideratum has led, no doubt, to the application of new materials for roads in large towns. As there are no means of measuring noise, opinions must be relied upon. When wood is new, close-laid, and the pavement is perfectly level, it may be characterised as noiseless. In consequence of the density of the asphalte the horses' hoofs can always be heard upon it; but as the surface wears away in undulations, not defined by sudden vertical depressions such as all pavements composed of blocks show when wearing away, the comparative quietude of wood and asphalte depends entirely upon the state of repair. Seeing that none of the wood pavements in London have lasted many years without being relaid in streets of great traffic, see reports of their existing conditions,‡ it appears to the author that they cannot be maintained with that evenness of surface which places them at the head of the list for noiselessness; and that on the average state of the two materials, asphalte is equal, if not superior, in this respect to any other kind of material, both it and wood being preferable to macadam, as that is to granite.

The only point now remaining is the gradients at which the material can be laid with safety. It would be unwise to lay asphalte on any gradient much steeper than 1 in 50, although a portion of Broad-street, London, is 1 in 46, and no inconvenience has been felt.

ROAD MAINTENANCE AND WATERING.

SOME useful hints as to road repairs appear in the report just presented to the Hackney District Board of Works by their surveyor, Mr. James Lovegrove, A.I.C.E. He explains that a change has been made in the character of road maintenance, especially in relation to the thickness of granite laid on the surfaces repaired. Instead of leaving a road until it becomes sufficiently worn to justify the use of a steam-roller over a heavy coat of granite, he suggests that it is more economical to repair it before it becomes bad for traffic. If the road becomes much worn the depreciation of the general surface increases in rapid ratio, while if it is mended in time it is found that the under angles of the granite turn over, and present all the under angles unbroken, with one worn or rounded face on the other side, so that under the pressure of the roller the stone quickly obtains a fixed position, and a good road is formed. The practical result of the alteration of mode of maintenance has been, that whereas 74,598 square yards super were required last year against 56,085 yards in the previous twelvemonth, the cost has varied between ¾d. to 20½d. in 1878 against 9¾d. to 23¾d. in 1877, and the cost per yard super for the steam roller acquired by the district board equalled 1·07d. against 1·61d. last year when under hire.

A series of experiments in street watering, with four kinds of vans and four kinds of cart, all of different makes, are tabulated, and show that the best results were obtained from a "No. 17" van and a "No. 31" cart. The former is mounted on springs and weighs nearly 19½cwt.; the distributor consists of a square box about 8¼in. in cross-section. The front of the box is of stout metal, perforated, and there is always a good head of water behind each discharging orifice with half distributing gear. 64 gallons are discharged per minute, covering 8·46 yards super per gallon. The cart is of same make with half distributing gear. These two vehicles were found the lightest for the horses to draw, with widest average spread, and a regular and even discharge.

Mr. Lovegrove goes in detail into the bad condition of new streets previous to their being taken to by the board, and during building operations, and arguing that the entire blame for their state should be laid on the freeholder and the builder. The present bylaws under the Building Act are insufficient to meet the case, and he suggests that a new clause be agreed to by the Metropolitan Board of Works, conferring the necessary powers on vestries and district boards, by which it shall be provided that previous to the erection of buildings in new streets the gulleys, footways, pathways, and crossings must be properly constructed and maintained to the satisfaction of the vestry or district board; in case of default, the vestry or district board to have power to proceed against the owner for penalties, also to stop the street, to execute the required work, and charge the owner of abutting houses or land or the freeholder, as in cases of apportionment for paving.

PAINTED TAPESTRY.*

THE application of woven tapestries to interior walls has been revived of late years with some prospect of success, but the great cost of the use of this fabric will always render it a very limited mode of interior decoration. Besides this disadvantage to the use of woven tapestry, there are many other excellent substitutes for ordinary plaster and paper of less cost that have been introduced of late years, such as painted wood panelling and other methods of decorative woodwork, stamped linoleum, and various linings of natural and plastic materials. Mural painting has been found to become speedily affected in the atmosphere of our towns, and except for public buildings its cost precludes its use to any large extent. We have now another material which promises to take the place of both mural painting and woven fabrics for ordinary decoration. It is called "Painted tapestry," made of a sort of canvas manufactured for the purpose and painted with liquid colours in imitation of the various fabrics of old tapestry cloths. We had lately an opportunity of examining a piece of this imitation fabric in a large West-end museum of decorative art, and can say with confidence the material fairly baffled detection at first sight, the imitation being so close to the original that few would not be deceived. The piece we saw was a copy of an old woven tapestry. When we consider the manner of manufacture this resemblance is not surprising; the canvas is made to imitate the old cloths, it has no smooth body or surface, and the colours used readily penetrate into the material, in fact, stain the canvas, which thus preserves the grain and textile appearance of real coloured threads.

We have on our table a work on the subject treating of the application of this fabric to interior decoration, and giving practical lessons in tapestry painting with liquid colour, by Julien Godon, which has been translated by Mr. B. Bucknall, architect. The translator's note furnishes a clear idea of the invention, and Mr. Bucknall quotes Viollet-le-Duc, who describes and illustrates these wall decorations in his charming book, "How to Build a House" (p. 251). We are certainly doubtful of the æsthetic reasons given in reply to Paul's inquiry in the dialogue referred to. If Flemish or Gobelin tapestry can not be obtained from its great price, it seems to us no good reason why painted imitation hangings should be adopted, however close the resemblance may be, because they can be had at a cost not much exceeding that of wall papers, and "less than upholstery hangings." We are certainly averse to all imitation fabrics, and we do not believe good art is possible so long as men can closely copy one material in another, to sell it at a lower price. The doctrine is certainly not a healthy one, for it tends to reduce all art to the level of a manufacture, and moreover it is dishonest. The painted tapestry, however, is not altogether amenable to these strictures. It is not a new art; it dates as far back as the 15th century, for it appears from the author that the Hôtel Dieu, Rheims, has a large number of painted tapestries which date from that period, and to which M. Vitet first drew attention. "The hangings of the Hôtel Dieu," says that writer, "are not tapestries, but large sheets of painted canvas, intended probably to be copied by weavers of tapestry. These hangings were most of them painted about the middle of the 15th century. The drawing is free and bold, the colours laid on with a master hand: they are pictures of great merit, apart from historical interest and their value in point of rarity and singularity." Painted tapestry comes down to us therefore with respectable credentials; we cannot strictly call it a manufactured imitation, for it is more than that; it is a painting on canvas, though somewhat restricted in its handling to the textile material it imitates. The only fear we have is that the handwork will be replaced sooner or later by block printing, and then all art will have vanished.

The material has unquestioned advantages, the painting has the flat tone and treatment required of wall painting, the cloths can be rolled up like paper hangings when required, and their non-conducting nature when hung checks condensation. M. Godon's treatise goes historically into the employment of tapestry, from which, had we space, many interesting facts might be gleaned. Quoting M. Darcel, in his essay in the *Gazette des Beaux Arts*, it appears that "we possess no examples of woven tapestry of earlier date than the 14th century," though the art of producing tissues in imitation of paintings has existed from the earliest period. The Babylonian women excelled in the art, and the tapestries of the palaces of the Assyrian kings are spoken of by ancient authors. Homer mentions embroideries of this kind; Greece and Rome were succeeded by the artists of the middle ages when woven fabrics adorned the churches and halls. Paul La Croix says it was not till the 12th century, after the return from the Crusades, that the use of tapestry obtained in the castles. Hangings of arras enriched many a feudal castle hall, upon which the ladies depicted stories of chivalry, or the pious legends of saints. The vertical and horizontal warps, the Savonnerie and other looms, are explained with some detail; and the celebrated tapestries of Aix, Angers, Arras, Auxerre, Bayard, Bayeaux, &c., are briefly described. Speaking of the painted tapestries, the revival of which is the chief aim of the author's work, he alludes to the difficulty of manufacture of the canvas, and the securing of colours, which must be at the same time fast and brilliant. These have been overcome; the canvas called "Binant canvas," is preferred, being woven with the yarn, which has a great affinity for liquid colour. This canvas may be had, it seems, in twenty varieties of texture, as square stitch, fine and coarse ribbed reps, gobelins, &c., of great widths; it is fastened on a stretcher, taking care not to strain it too tight, and to preserve the straightness of the texture. The liquid colours are applied as in ordinary painting, with brushes like those used for oils, and colours like those generally used in water-colour drawings; these should be "fast." Other requisites are necessary, such as bottles for keeping the liquid colours, paper upon which the sketch of the subject is made, a pricker, and pounce bag. The canvas being stretched and placed on the easel, a sheet of cartridge paper of the same size is fastened on it by pins, and the subject is sketched in with a charcoal pencil lightly. The outlines are drawn in carefully, after which the paper is taken off the canvas and the drawing is pricked through and pounced, and the paper is then removed leaving the design dotted on the canvas, which is afterwards lined in with colours of a suitable kind and the colouring commenced. The lessons given by Mr. Godon are very simple, and anyone who has drawn in water or oil colours could easily follow the instructions. Some useful hints are given touching the contrast and juxtaposition of colours as explained more fully by Chevreul in his excellent work, also remarks on ornamental borders. The instructions in the preparation of the colours are full and concise, and contain scales of tints for foliage, sky, &c., different tones being used in the different parts to produce the proper gradation of colour. We are not so well satisfied with the coloured example given, the subject chosen and the colouring being of a too pictorial kind to suit our ideas of wall decoration; and we are sorry a better example has not been chosen. Other processes of tapestry painting are pointed out, such as albumen painting with white of eggs as the medium, oil painting, acid painting, &c.

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* Roads and Bridges Municipal Service of Paris. Schedule and specification for footpaths and pavements in bitumen and compressed asphalte issued by the Prefect of the Seine.

† Approximate. ‡ Colonel Haywood, Report, 1877.

* Painted Tapestry and its Application to Internal Decoration. By Julien Godon; translated by B. Bucknall, Architect. London: Lechertier, Burke, and Co.

Such are the leading features of this process which have been fully discussed in M. Godon's treatise. We can only say that these painted hangings may be rendered accessory to decorative effect where mural painting cannot be resorted to, and in certain hands may become really artistic decoration. M. Godon's work, by calling attention to the subject has done service, and we can recommend it to the attention of the decorative artist.

MACES.

At one of the meetings of the British Archæological Association at Yarmouth during the recent congress, Mr. George Lambert, F.S.A., of London, read a paper on "The History of Maces and their Antiquity." He said the mace (*massue* or *masse*) was a weapon formerly used both in battles and tournaments, and was also the common weapon with ecclesiastics, who, by the tenure of their office, were forbidden to use the sword. Maces were presumed to be the representatives of sceptres, a name derived from the Greek. The latter was a staff or rod carried by kings or rulers as an emblem of power—sovereign and judicial. It was considered as a holy or sacred emblem, and to touch the sceptre was to make the most solemn of all objurations. The mace dated from the very highest antiquity and had assumed various forms, that of a pole, a leaning staff, shepherd's crook, and so on to its present shape. Mr. Lambert then enumerated the dates when maces were presented by different kings and others to cities and towns, and remarked that at New Romney on the previous Thursday he had seen the two maces borne before the corn barons of the Cinque Ports in the persons of their bailiffs when they attended at Great Yarmouth to superintend the business transacted annually at the grand mart or fair for the sale of herrings which was granted to the Cinque Ports, and in these bailiffs might be traced the first municipal jurisdiction of the Borough of Yarmouth, over which the Cinque Ports continued the prerogative during the free fair. In the year 1574 a Bill was introduced to Parliament to enrol Yarmouth as a Cinque Port, but it was never properly carried out, and it was not until the year 1702 that the government of Yarmouth was properly settled, under Queen Anne, in its present form. The paper next dealt more particularly with the maces of the Borough of Yarmouth, of which, it stated, there were two large ones made in the year 1690. The crowns did not unscrew, and were of the ordinary type of corporation maces. There were five smaller maces for the five sergeants at mace. Each of them is seven inches long with the arms of Yarmouth, the half lions and herrings' tails, and round knobs at the base. There was a larger one, 10 inches long, with the arms of France and England, and a more modern anchor at the base. This, he was informed, was the Admiralty mace. The silver gilt mace, six inches long, was the Mayor's emblem of power. It bears the arms of Charles II., that king's monogram, and four shields, the lions of England and Scotland, the harp of Ireland, and a Star of the Bath. The silver Oar was of a much later date—viz., 1784—and bore a Latin inscription. It was four feet in length, and bore the Royal Arms, the arms of the town, and, he was told, the arms of Killett, by whom it was presented. The Sword of State had this peculiarity, that it bore the arms of Charles II., but in lieu of the lion of Scotland was the Tudor rose. The silver monteith was a punchbowl made in the year 1698-9, with the crown to insert the wine glasses over the water when they drank the king's health. The large round of beef dish, or plum-pudding dish, dated 1664, was the gift of Mr. George Morse, and the loving-cup bore the date of 1737.

COMPETITIONS.

Darwen Town Hall.—The *Preston Herald*, in referring to the visit Mr. Alfred Waterhouse paid Darwen last week, to examine the plans in this competition, says that the referee's "decision has not yet been made known, but probably the plan bearing the motto '1879' will obtain the first prize of £100, and the one bearing the Shakespearian motto 'As You Like It' the second prize of £60."

Jarrow Post-Office.—The councillors for the above-named place finished, last week, their inspection of plans for a proposed new post-office, submitted in competition for a prize of £25. The successful competitor was Mr. Robert Wardle, architect, North-street, Jarrow-on-Tyne.

Wolverhampton.—In a limited competition for new offices and premises in Darlington-street for the Wolverhampton Gas Company, designs were submitted by Messrs. Veall, Fleeming, Banks and Doubleday, and Johnson. That of the former was selected by the directors, and a contract having been entered into with Mr. Henry Clark, of Wolverhampton, for the sum of £6,500, the works are now commenced. The buildings are situate at the corner of Darlington-street and Waterloo-road, and comprise extensive offices, board-room, show-rooms, warehouses, and workshop, together with a residence for the secretary, and two shops with dwellings attached to be let at a rental. The elevations are in red pressed bricks and Grinshill stone.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Cambrian Archæological Association.—On Monday the Welsh archæologists assembled at Welshpool for their thirty-fourth annual meeting, the inaugural address being delivered by the president-elect, Mr. C. W. Williams-Wynn, M.P. The congress occupies the whole of this week in excursions into the surrounding districts and in the reading and discussion of papers. The excursionists on Tuesday proceeded first to Buttington, three or four miles from head-quarters, to note the site of a battle with the Danes, A.D. 894, and to examine the church and a remarkable font there. The party then divided, section one proceeding to the old mill ford over the Severn, to note a moat and dyke of ancient formation, and thence along a supposed route of the Romans to what is spoken of as an ancient fortress on the Breiddon, to a British camp on Cefn-y-Castell, meeting section two at Crewe-green, the second party having in the meantime examined the remains of Wattlesborough Castle, Alberbury Church and Priory; and the united party, after meeting at Crewe-green, jointly inspecting Llandrinio Church and the site of Ystrad Marchell Abbey (*Strata Marcella*). Wednesday's excursion was a short one, the destination being Oswestry, which was reached by the Cambrian Railway, and the chief objects to be visited being the church, castle and walls, and Whittington Castle. Thursday was devoted for the most part to the immediately local objects—Welshpool parish church, Powis Castle, camps in Powis Castle park, &c., and an afternoon drive to a Roman camp at Gaervawr, and to see the newly-restored church at Guilsfield. To-day's visit is a lengthy excursion to Bwlch Aeddan camp, Clawdd Llesy Dyke, Cobham's-garden (scene of his capture), and camp on Bromarth-hill; and then to examine the large church at the village of Meifod, the site of an ancient castle (Mathraval Castle), and Llanfair Church. To-morrow the concluding excursion will extend to Montgomery to examine the castle and the church. Evening meetings were held on Tuesday, Thursday, and to-night.

The Monmouthshire Antiquarian Society held their annual meeting at Caerphilly Castle, on Tuesday week. The President, Mr. Octavius Morgan, delivered an address in which he traced the history of their meeting place, which was built about 1270, by Gilbert de Clare, on the site of a palisaded mound previously known as St. Genith. Advantage was taken of a tongue of land which stretched down from the west between two rivulets. Two or three transverse cuts were made in this, leaving a block of land on which the castle was constructed. The removed earth was used for a dam, keeping up a lake across the valley as at Kenilworth. Another cut was made above the castle to separate a portion of the land from the high mound behind, so as to form an exercise ground. The whole construction showed great skill and peculiar military knowledge. The architect was believed to be Henry de Erlington, who built Harlech Castle, a very similar structure, in 1280. One of the towers leans, and a peculiarity of the whole fabric is, that to this day no ivy clings to the walls. Gilbert de Clare, the original possessor of the castle, died aged 23, at the battle of Bannockburn, and one of his sisters and heiresses was married by Hugh de Despencer, the younger. About 1316 Despencer made great alterations in the castle; he widened the banqueting hall, put in a series of corbels, ornamented the windows with ogee arches, and made a grand open fireplace. At one end he added state apartments, and at the other end a series of kitchens and offices. The president then escorted the members on a tour of the castle, pointing out the several features.

Wiltshire Archæological Society. — The annual gathering of the members of this society commenced on Tuesday week at Marlborough. The business meeting was held in the afternoon at the Town-hall, under the presidency of the Marquis of Ailesbury, who was supported by the president of the society, Sir John Lubbock, Bart., Rev. Bryan King, and others. The chairman opened the proceedings with a short address, after which officers for the ensuing year were elected; Lord Edmund Fitzmaurice, M.P., being chosen president in the room of Sir John Lubbock, whose term of office expires. After a paper on Savernake Forest had been read by Canon Jackson, the members visited the churches and other objects of interest in the borough, and in the evening the anniversary dinner was served in the Town-hall. Later on there was a *conversazione* at Marlborough College, where several papers were read. On Wednesday the members partook of Lord Ailesbury's hospitality at Savernake.

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A system of tramway lines is being laid down in Derby. The corporation have selected as the rail that patented by Barker, which has been for some years in use in Manchester.

The town council of Shrewsbury have resolved to offer a premium of 25 guineas for laying out a quantity of public land as building sites.

Building Intelligence.

Colchester.—A new soldiers' home was opened next the theatre, in Queen-street, Colchester, on Saturday week. The entrance is into a spacious bar, with pitch-pine and marble fittings, while behind are the kitchen and out offices. To the left is a library, at present furnished with some 500 volumes, and there is also a coffee-room. At the rear, approached by a glass-covered way, and also by a passage from the street, is the lecture-hall, 35ft. by 60ft., with open roof and pitch-pine fittings, and adjoining it a billiard-room and bathroom. On the first-floor are reading and game rooms, and above are bedrooms. The building has a Queen Anne front next the street, with moulded brick pediments and string-courses. It has been converted from a private house at a cost of £5,000. Mr. G. Gard-Pye, of Colchester, was the architect; Mr. F. Dupont the contractor; and the decorations were carried out by Messrs. G. Rickword and Son.

Handsworth.—On Wednesday the foundation-stone of a new Roman Catholic church at Handsworth was laid. The edifice will be in Perpendicular style, similar to some of the old churches in the district, and will be constructed of stone hewn from the Duke of Norfolk's quarries at Bole Hill. The roof will be of Broseley tiles. The building will accommodate about 800 persons. In addition, there will be schools, and a residence for the priests in charge. The total cost is estimated at between £8,000 and £9,000. Mr. M. E. Hadfield, of Sheffield, is the architect, and Mr. M. Dowling, Sheffield, has the building contract.

Hooton.—The new Roman Catholic Church of St. Mary of the Angels, which has been built at Hooton, Cheshire, was opened last week. The style is Early Decorated. The church has a nave and a chancel, the former having an open roof bordered with pitch pine under the rafters, and divided into panels, and the latter (the chancel) having a semi-octagonal apse, and vaulted in yellow Stourton stone. There is also a side chapel, with a semi-circular apse, and opposite to this there is a transept containing the vestry for the choir and a sacristy. Mr. E. J. Tarver, of Charing-cross, London, was the architect. The stained-glass windows were executed by Messrs. Heaton, Butler, and Bayne.

Ipswich.—Contracts for the erection of the first portion of the new church of St. Michael, in Upper Orwell-street, Ipswich, will shortly be advertised for. The works will comprise part of the nave and aisles, at an estimated cost of about £2,000. Mr. E. F. Bisshopp, architect, of Ipswich, has prepared the designs for the new building. The same gentleman is erecting a parochial-room, in the parish of St. Mary, Stoke, Ipswich, Mr. Gladwell being the contractor. Somersham Church, a small structure of Perpendicular character, and about five miles from Ipswich, is shortly to be re-pewed and repaired, and like the important church of Bildestone, is to have its roofs restored in accordance with Mr. Bisshopp's report. Woolpit Church has already been reseated, and new foundations have been put to the piers of the nave arcades. Mr. Snell, of Woolpit, was the contractor for the work, under the direction of the same architect. Woolpit church is interesting as having the only spire in High Suffolk. It is described as having been built of brick during the present century.

Iron Acton Church.—The restoration of Iron Acton church, which was begun in September, 1878, is now completed. The work has been carried out under the direction of Mr. T. G. Jackson, architect, at a cost of £2,800. The walls have been made strong, and partly rebuilt; the tower has been opened out, so as to form a baptistry; the east window, hidden for at least a century and a half behind a wooden panelling on which were painted the figures of Moses and Aaron holding the Tables of the Law, has been once more brought into view; and two galleries, erected in 1791 and 1823, have been removed. The original oak benches, with panels of delicately carved linen pattern, have been disencumbered of modern additions; new benches have been worked in exact correspondence with them; the roofs have all been reset, and the ceiling made good; a ceiling, with oak ribs and elaborately carved bosses, has been placed in the chancel, which has also been fitted with oak stalls. It was found necessary to rebuild the porch (of the 17th century) on the north side of the church. The old ashlar work has been used again in the new structure, a chamber or parvise having been added to serve as a vestry.

Pirton.—A raising dinner has recently been given to the workmen engaged in erecting, for Mr. Wm. Hanscombe, a new residence, which is to replace the Moated Grange, Pirton, on the borders of Beds and Herts. The new mansion is situate on a knoll overlooking its predecessor, which was built in Elizabeth's reign. The house faces the south-east, with extensive views from three fronts. From the inclosed porch, a spacious hall conducts to the morning-room and drawing-room, which communicate with each other, and with a flower-room, by folding doors. An inner hall and staircase, 22ft. square, and 25ft. high, form a central feature, round three sides of which the rooms already mentioned open out. The staircase is open-timbered, broad, and easy in rise, with turned and carved balustrading, and with panelled ceiling above. The main wall of staircase, and the garden entrance and passage, demarcate the family rooms and domestic offices. The kitchens, store-rooms, and pantry, are planned in communication with the service to the dining-room. On the first-floor are six bedrooms, two dressing-rooms, day nursery, with large oriel window, bath-room, linen-room, &c., and above, good attics and lumber-rooms. The joiners' work generally is pitch-pine and red deal, with Vancouver pine in panels, all stained and varnished, very little paint being used internally. The mantelpieces are of walnut wood and various marbles combined, and every detail throughout the house has been specially designed by the architect. The style is Elizabethan. The materials are Hitchin red bricks, with dressings of a blue-grey vein of Bath stone, and Broseley tiles. At the rear of the house is a range of stabling, and at the entrance a gate-lodge, all corresponding in style. The general contractor is Mr. Twelvetrees, of Biggleswade; the clerk of works, Mr. V. Trubshawe; and the architect, Mr. T. C. Sorby, of Bedford-row, London. The mantelpieces have been executed by Messrs. Geo. Jackson and Sons, of London.

Wapping.—The new church of St. Patrick, Wapping, was opened on the Feast of the Assumption. The building is of simple construction, somewhat resembling the early Roman basilica. When completed it will cover a space 118ft. by 52ft., divided into nave 25ft. 6in. wide, and two aisles 13ft. 3in. wide each, by two rows of Ionic columns, 17ft. 6in. from centre to centre, which will form seven bays and carry the roof, &c. The nave is covered by a semi-circular barrel roof, and the aisles with flat roofs are deeply coffered and executed in fir. The height of the columns is 25ft. 6in., the height to the ceiling of the aisles 29ft., to the centre of the ceiling over nave 42ft. The church is lighted by a large circular window in the west end of nave 16ft. in diameter, and by windows in the aisles 18ft. above the floor line. The materials used are white bricks, with a dado of red and yellow bricks, and Bath stone columns, strings, &c., and a wood brick floor inside; and in the exterior stock bricks and Portland stone dressings. The roof is covered with specially made Roman tiles. The cost of what has been now built was £4,150. Mr. Francis W. Tasker, of John-street, Bedford-row, is the architect, and Mr. Nightingale, of Albert Works, Lambeth, is the contractor. On the sanctuary wall is a large painting of the Crucifixion by Mr. Bower.

CHIPS.

A lady at Florence has just presented to the Swedenborgian Church at Kensington, three *bas relievo* sculptures by Flaxman—in fact, the very works submitted on his election as a Royal Academician. Flaxman himself was a member of what is called the New Church.

The foundation-stone of a chapel and school-room for the Primitive Methodists was laid at South Normanton, near Derby, on Tuesday week. The total cost of the buildings and land will be £1,100, and the chapel will seat 450 persons.

The burial board of Llandiloes have accepted the tender of Mr. Meredith, amounting to £1,385, for the erection of chapels, walls, and outbuildings at the new cemetery. This was the lowest tender; the highest was £1,750, and was sent in by Mr. Williams.

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Sabrina. (No.)—J. J. M. (It is rather difficult to advise you. Are you an architect? If so, and your father has simply offered to carry out your designs, you have a right to demand payment on the usual scale, whether they are executed or not; but if, as seems to be the case, you and your father together, as builders, have simply prepared estimates for a job which has not been carried out, it is doubtful whether you have any claim at all. You had better consult a local solicitor.)—A. B. (All information may be obtained from the secretary of the Science and Art Department, South Kensington.)

"BUILDING NEWS" DESIGNING CLUB.

(We regret we are again obliged to postpone our review. We trust to insert it next week, and soon after to publish our award.)—A. E. T. French. (Drawing received too late.)

Drawings Received.—F. L., W. Bros. and Beck, B. and C. with thanks, E. F. B.

Correspondence.

HULL BOROUGH ASYLUM COMPETITION.

Sir,—I note in your critique on the plans for the above you say that the competitors "Argus," and "Lucidus Ordo," have sent in explanatory notes calling attention to mistakes, and giving an explanation of the terms in the report, &c. Can anyone inform me whether these notes were sent in along with the plans, viz., on the 21st July, or some time subsequent, as in the latter case I should hardly consider their admission fair.—I am, &c., Act on the Square.

Hull, August 27.

Sir,—In your review last week of the Hull Borough Asylum Competition, you state that one of the requirements laid down by the justices is a recreation-hall. This appears to be a mistake, because there is not in the requirements issued by the committee one required, although the author of No. 1 in your list may have not forgotten. He like many others (myself for one) did think of such a requirement; but, owing to the instructions given, which stated the principal requirements, a recreation-hall not being mentioned, I came to the conclusion that the intention of the committee would be to utilise the dining-halls for that purpose.—I am, &c.,

Durham, August 26. A Competitor.

COMPETITION FOR SUBURBAN MISSION CHURCH.

Sir,—Your correspondent "Observer" in last week's issue, thought it necessary to warn intending competitors that the son of the vicar of the mother church was an architect, and did me the honour to refer to me by name. The allegation is correct, but inasmuch as my name and address are on the plan of the site issued to competitors (some six or seven in number) need I say that the warning is unnecessary, and that I am not one of that number; and may I add that if my advice to the Building Committee be followed—though for so small a matter—an architect unconnected in every way with those interested in, and acquainted with Church work, will be called in to decide the competition.—I am, &c., Wm. Henry Powell.

18, Mecklenburgh-square, London, W.C., Aug. 23rd.

ST. NICHOLAS' CHURCH, GREAT YARMOUTH.

Sir,—I perceive by the report of the proceedings of the Archæological Congress at Yarmouth that Mr. Brock—who calls himself my professional brother, but whom I have not the pleasure of knowing as I should like to do—made some comments not only upon the work of restoration which I have carried out at St. Nicholas' Church, Great Yarmouth—and which I am prepared to defend if need be—but upon other (said to be proposed, but as yet unexecuted) works, which he not unnaturally supposed have had some sanction or authority of mine. I desire, therefore, to inform Mr. Brock, through your pages, that, though I had the conduct of all that was carried out at that church during the incumbency of the Rev. Mr. Nevill, now Archdeacon of Norwich, since then I have been refused the same control; and when some splendid glass by Messrs. Morris was removed from the tracery of the east window, contrary to my advice, and the whole of that window filled with other glazing about which I was not consulted, I wrote to the committee to resign my position as their architect. I am, therefore, guiltless of any further designs upon the fabric.—I am, &c.,

John P. Seddon.

P.S.—Although Sir Gilbert Scott once reported on the condition of St. Nicholas' Church, his report was not acted upon, but the work placed in my hands instead of his, so that I cannot be said to have "succeeded" that eminent man, as elsewhere in your report I am described to have done.

FONT COVERS.

Sir,—At the commencement of this year, I contributed a note to "Our Commonplace Column" on the development during the 14th and 15th centuries of the fashion of adding wooden canopies to fonts. To the examples of covers then given (in issue for Jan. 31, p. 133 of last vol.), it may be worth while to add and place on record brief notices of a few others seen during the recent Congress, in East Anglia, of the British Archæological Association. Compilers of architectural dictionaries and encyclopædias seem to follow doggedly in their predecessors' steps in the enumeration of instances, and it may at least afford them the opportunity of a somewhat wider field from which to select. Although many were destroyed during Dowson's visitations of 1643-4, in no part of England are specimens of this detail of church decorative furniture so elaborate, so numerous, and so varied as in the Eastern Counties.

The finest example of a font cover seen during the nine days' Congress was that at Salle, near Cawston. It is a lofty octagonal structure, built up upon a solid lid as a series of narrow oak rafters set vertically, with the flat sides next each other at 2in. distance, from each angle towards the centre of the font. These strips of wood are connected with each other by Perpendicular tracery, and the whole composition diminishes by regular stages marked by sets off of miniature buttresses to a richly-crocketed finial. The open lattice-work, the numerous pinnacles, the cuspings, crocketings, and mullions, all delicately but shallowly carved from the solid, would have, but for the large scale, all the effect of fretwork. The most singular feature of this cover is the mode in which access to the font is provided. Instead of opening triptychwise, it is suspended by a chain from a huge beam, which projects most awkwardly from an open ringers' gallery in the tower arch. Beam, gallery, and cover are coeval in date, probably 1460, are carved in similar style, and the two latter are still adorned with tarnished gilding and faded spiral lines and spots of many colours.

At Cawston the cover is much later in character. Of large dimensions, it fits the font like the lid of a coffee-pot, and diminishes to an ogee cap, on which is a carved wooden dove, by two abrupt sets-off, in evident parallelism with the enlargement of the font bowl from its stem. The surface is panelled with debased Gothic mouldings, and the general effect in outline as well as detail is harmonious with the font. One of the few features not obliterated from Somerleyton Church, near Lowestoft, during its rebuilding twenty years ago, is the excellent Elizabethan font-cover.

The font-covers seen at Norwich were almost all of post-Reformation date. That at St. Peter's Mancroft, is a baldacchino rather than a cover; it consists of a series of columns of Late Perpendicular character, inclosing the font as in a baptistry; the canopy, which was an Elizabethan addition, was removed about five-and-thirty years ago. A better known example of this mode of treatment is the oft-illustrated example at Trunch, near Cromer. That at St. Stephen's is of iron, now gilded, and consists of eight eagles' necks, held together by a ring beneath the heads, so as to form an open canopy, of good outline; above is an eagle, apparently a modern addition. At St. Gregory's is one of similar character, but of wood, and better executed; the birds' necks are covered with free Renaissance decorations, in patterns executed in low relief. In the churches of St. Michael at Thorne, and St. Etheldred, there are plain Elizabethan covers; and at St. Lawrence is a much later one, quite Carolvian.

The font coverings of Southwold and Gorleston were broken down by the fanatic Jessope, during his visitation of East Anglia, as he tells us in his journal, and this, in the former case, is much to be regretted, for it was doubtless equal in character to the rest of the woodwork in the church, and that is unsurpassed in elaboration of carving and colour decoration on the Eastern coast.

Several examples of covers are to be seen in the churches of Ipswich, including those at St. Mary-le-Tower and St. Matthew; they are all of wood, not very large, and of the usual Perpendicular character.—I am, &c.,

E. W. P.

MANSION AT FRITTON.

Sir,—In your issue of the 15th inst., on p. 183, I observe a casual reference to my house here as having been built from Mr. Jeckyll's designs. I think it just to the architect who was really responsible for the work to correct this. The first plans for the alterations and additions which I proposed to make to the house were commenced by Mr. Jeckyll, but they were not completed before his illness deprived me of his services. They were then taken in hand by Mr. Z. King, of Victoria-street, who proposed the arrangements and designs which were finally adopted, and the work was carried out under his superintendence.—I am, &c.,

H. E. Buxton.

Fritton, Yarmouth, August 22.

CHIPS.

On Monday the corner stone of a chancel was laid, which is to be added to the church at Bagnall, a little village situated on one of the ranges of hills lying to the east of the Potteries. The church, which was built about 40 years ago, and, it is said, replaced a Saxon edifice, at present consists merely of a nave and tower, not even possessing a vestry, and is moreover a diminutive building. A chancel, 21ft. by 16ft., is to be built, and the nave will be lengthened about 6ft. A vestry and a baptistry are also to be added, and provision will be made for the choir and organ in the new chancel. The cost of the present alterations will be about £500. The chancel, which will be in the Perpendicular style, like the nave, is designed by Mr. J. Beardmore, sen., of Hanley, and Mr. H. Goldstraw, of Wetley Rocks, is the builder.

About 150 large villas have been erected near the Sidcup station of the South Eastern Railway. Mr. George Hawkins was the builder.

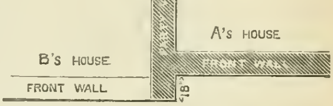
It has been decided to inclose the new organ in Salisbury Cathedral by a carved wooden screen to be constructed from the designs of Mr. G. E. Street, R.A.

The Bilston town commissioners have reduced the salary of their surveyor, Mr. Lloyd, by £60 per annum, in consideration of allowing him to undertake private work.

Intercommunication.

QUESTIONS.

[5874.]—**Apportionment of the Cost of Building Party Walls.**—I will be much obliged by yourself or any correspondent favouring me with your opinion or referring me to any decision bearing on a similar case to the following:—A and B have recently built a house, each of them contiguously, on a plot of land, in conformity with general block-plan and elevation, and subject to a stipulation that whoever built his house first would be entitled to repayment of one half of the expense of building the party walls. A has built his house first, and also the party walls, with fireplaces, &c., on B's side of it, according to a plan supplied by B, and also built a projection of about 18in. as sketch, in conformity with general plan and elevation, said projection being also shown on plan and elevation supplied by B. B now declines to pay more than for cost of building the one half of this projection, and A contends that although no specific agreement was made as to this, that he is entitled to be repaid for the cost of building the whole of the projection, as B gets all the benefit of it by the increased depth or accommodation in his house.—A's Surveyor.



[5875.]—**Surveyor's Charges.**—I was employed to lay out a small estate for building, and to apply to the Metropolitan Board for their approval of the plans, which I obtained. I then let the land to a builder at a ground rent of £280 per annum. I shall be obliged if any of the readers of the Building News, who have had experience with building estates, will inform me what would be a fair and reasonable charge for my services.—Building Surveyor.

[5876.]—**Circular Brickwork.**—Would someone kindly explain the following:—On page 14 of "Quantities," by Mr. Banister Fletcher, I find the following respecting circular brickwork:—"Circular and semicircular works are indicated as such in the dimension book and the diameter figured inside. Thus, where the item is a cube the depth or height is placed under, thus—

2′ 6′

10′ 0″ | 19′ 7″ | cube brickwork to circular chimney.

Now, the following are my dilemmas—1st. Would not a circular chimney 2′ 6″ diameter be equal in area to a square figure of 2′ 3″ sides; if so, the total amounts to 55′ 11″? 2nd. How could a chimney 2′ 6 diameter contain the very small area of 1·964285714ft., considering what proportion it bears to a square figure of which the sides are 1′ 5″ respectively?—Harry Elmitt.

[5877.]—**Hip Rafter and Half-Timbered Work.**—Can any reader give me a simple rule for finding the scantlings of hip rafters of a given length? Also, what is considered a fair price per foot cube for half-timbered work, the ground floor portion being entirely of brick?—P.

[5878.]—**Large Churches.**—Can any reader inform me where I could obtain a list of the English parish churches which would give internal areas? Great Yarmouth and Coventry are stated to be the largest. Is this correct?—J. W. C.

[5879.]—**Lights.**—I am about to build some cottages on a piece of ground, one side of which is bounded by a dwelling house which has two small bedroom windows (more than 21 years old) overlooking the ground. Will some one kindly state what distance from the windows I must build so as not to legally obstruct the light? I thought of making an open passage 3ft. 6in. wide between. Would that be sufficient? Both windows are nearly as high as the eaves of my cottages will be.—C.

[5880.]—**Architect, Builder and Client.**—An architect, after having given his final certificate, finds that the lap of the slates is insufficient. He had previously drawn contractor's attention to the defect, but the fact escaped his memory when certifying at the close. A short time afterwards the architect was reminded of his omission by a complaint that rain was being driven under the slates and was injuring the ceilings. The architect immediately wrote to the client, withdrawing his certificate, and cautioning him not to pay the balance to contractor till roof should be re-covered, the balance in client's hands being sufficient for the purpose. 1. Could contractor insist on receiving said balance, or, in other words, was it too late for the architect to attempt to make contractor carry out the specification or consent to have the value of the work kept back? 2. How far would it complicate an answer to the foregoing if the contractor became bankrupt after said final certificate was given, and included in his list of assets given to the court the amount of said certificate? 3. The contractor being in bankruptcy and unable to carry out the works, the architect sends another builder and has them done. Client being noticed by contractor's attorney, refuses to pay second builder sent by architect. Can architect be made liable? 4. If a certain part of slating which was specified to get 4in. lap only gets 3in., and if in the architect's judgment 3in. is sufficient (for the out offices) and for that he gives his certificate to contractor, can client insist on getting the roof re-slated with 4in. lap and deduct from architect's fees the cost of same?—Henricus.

REPLIES.

[5864.]—**Partitions.**—"G. P. B." says that lath-and-plaster partitions are objectionable on account of sound penetrating from one room to another. A good way of preventing this is to lath-and-plaster between the quartering. Fillets should be nailed to the sides of the quartering to receive the laths, on which a coating of coarse stuff is, of course, all that is necessary.—C. F. M.

[5870.]—**Domes.**—I can offer "X. Y. Z." my own opinions as to the method of determining and constructing domes. 1st. Chain bonds should not be required in any dome constructed on scientific principles or otherwise properly equilibriated. A dome not built in equilibrium would never sleep, but incessantly strain on whatever tied or hooped it round, and, besides, unless the tie be outside it cannot well perform its duty, and if so then it must either cause the masonry to have to be weakened and cut away for it, or else it must be exposed, or it must be in the joints where it cannot do its duty but would tend to oxidise and split the stone. The rods would be inadmissible, because between them would be weak places, and they would have to go through the stone, and if many would split it at many places, and when the iron had perished it would be difficult to replace without disturbing the masonry. If any strain were taken the relaxation would allow the work to give way, and, besides, they would not look well. I am aware that Brunelleschi used bond in his cupola, but if his masonry was good I can imagine no advantage he gained by so doing, but our days are more scientific than his were. If a dome be designed in equilibrium it may be built any size which will not cause a weight so great as to crush the stone of which it is built. If a dome were to be hemispherical it would most assuredly fall, but there will be in every case a curve and one curve only, which will be in equilibrium, and as I imagine that if "X. Y. Z." really has a dome to build he will require much more practical knowledge than I could give him in a letter without going to a great length, I should be agreeable to arrange to correspond direct or meet him as most convenient if he will give his name and address. Of course, I should expect a consideration in return.—Henry Ambrose, 15, Upper Parkfields, Putney, S.W.

STATUES, MEMORIALS, &c.

Close to the statue of the late Mr. George Peabody, in the Royal Exchange avenue, there is in course of erection a drinking-fountain, designed by Mr. J. S. Edmeston, architect, and consisting of a base and pedestal in red and grey polished granite of varied tints, which rises to a height of 3ft. 6in. There are four basins, facing north, south, east, and west, respectively. The upper portion of the fountain consists of a canopy in bronze, resting upon double columns at each of the four angles, surmounted by enriched capitals. An ornamental turret rises above the canopy; the extreme height of the fountain, including the base and pedestal, being about 16ft. The statuary within the columns under the canopy consists of a full-sized seated figure of a female, with a child on her knee, and designated "Charity." It is the work of Mr. Dalon, sculptor, of Chelsea. The entire cost of the fountain is estimated at £1,500, the expense of the statuary alone being £300.

Highgate Cemetery. — A very large and elaborate monument, designed by Mr. J. O. Scott, architect, has just been erected in Mr. Julius Bur's mausoleum, Highgate Cemetery, to the memory of his only daughter. The design is Italian Renaissance. Standing on two steps in St. Ann's marble is a moulded base, on which stands a sarcophagus, in which will be placed the coffin. On this will be a group in statuary marble, now in the hands of Mr. H. H. Armstead, A.R.A., representing an angel receiving the spirit of the departed; around this is a recessed arch with jambs and carved angels in spandrels. On either side of the sarcophagus is a pedestal, supporting a square column and pilaster, fluted and carved capitals. Over these is a bold entablature, in the frieze of which, and over group, are a number of cherubs holding a ribbon. The material is Sicilian marble, and has been executed by Mr. Henry Terry, architectural sculptor, Lambeth-road, who is also preparing an elaborate marble floor for the mausoleum. A bronze gate, from the design of the above architect, carved by Mr. Brindley, and cast by Mr. Young, of Pimlico, has recently been hung in position.

WATER SUPPLY AND SANITARY MATTERS.

Aldershot.—A Local Government Board inquiry was held at Aldershot on Wednesday week, before Mr. S. J. Smith, C.E., with reference to an application from the local board for sanction to borrow £2,000 for works of sewerage. North-town was mentioned in the course of the inquiry as a place where sewerage works had been carried out at a cost of £551, included in the sum sought to be borrowed, and the inspector stated that the local board could not possibly borrow a sum of money which had already been paid. On Redan-hill being mentioned as a district where it is intended to carry out sewering, Mr. Trimmer, the owner of the land, opposed the scheme on the ground that he had a private road with which it would interfere. The inspector replied that if he was the owner of a park and it was necessary to cut through it for sewerage purposes, the Public Health Act gave power to do so, providing that any damage done was paid for.

Keith, N.B.—A new water supply was turned on by the local authority last week to the burgh of Keith. The water is 2½ miles from the town, and is supplied by gravitation from springs between two hills known as the Great and Little Glacks of Balloch. Mr. Willet, C.E., of Aberdeen, was the engineer. Mr. Scott, of Inverness, carried out the works at a cost of £1,985. The pipes were supplied by Messrs. D. T. Stewart and Co., of Glasgow, for £2,097. The total expense has been about £5,000. The reservoir holds 82,000 gallons of water, and a supply of 110 gallons per minute can be furnished in the town.

Milton-next-Sittingbourne.—On Wednesday week Major Tulloch, one of the inspectors of the Local Government Board, held an inquiry at Milton respecting the application of the improvement commissioners for sanction to borrow £5,000 for works of water supply and £5,000 for sewerage and paving. After a long investigation the inspector said the circumstances of the case were so peculiar that he would take the unusual course of offering a few words of advice. It would be a great pity to erect waterworks at Milton, with the mains of the Sittingbourne local board passing by at their doors. The latter works, erected at a cost of £7,000, could supply them admirably, and had a pressure which the Milton works could not have. He recommended that the Milton commissioners should, if possible, acquire a joint interest in the waterworks of Sittingbourne, and that from the point of connection with Milton they should enjoy privileges and bear the liabilities according to the rateable value of the houses in each parish using the water. Failing that he advised a separate supply for Milton.

Sanitary Congress.—The Sanitary Congress and Exhibition of the Sanitary Institute of Great Britain will this year be held at Croydon. Dr. Richardson, F.R.S., has accepted the office of President. The Congress is divided into three sections,—viz.:—Section 1.—Sanitary Science and Preventive Medicine; president, Alfred Carpenter, M.D., London, J.P. Section 2.—Engineering and Sanitary Construction; president, Captain Douglas Galton, R.E., C.B., F.R.S. Section 3.—Meteorology and Geology; president, G. J. Symons, F.R.S. Arrangements have also been made for one or more lectures, one of which will be delivered by Professor Corfield, M.A., M.D.

Thames Haven.—One of the main provisions stipulated by the Privy Council for a cattle landing station is that it shall possess an ample supply of pure water. In this essential the Thames Haven foreign cattle landing station has been greatly deficient for some years past, but at length an excellent supply has been secured. The company placed the matter in the hands of Mr. W. Barns Kinsey, C.E., of Southwark-street, London, to investigate, and that gentleman having reported favourably, boring was commenced in February, 1877, by Messrs. S. F. Baker and Sons, as contractors. The boring was started with a diameter of 16in., and was carried down through clay, ooze, and sand to a depth of 78ft. 3in. It was lined with cast-iron pipes 16in. in diameter, and at the above depth the water was tested and was found to contain the large quantity of 3,367 grains of solid matter per gallon, with 333 grains of volatile organic matter and 1,190 grains of chloride of sodium. The boring then proceeded through sand and clay in veins, and at 90ft. 6in. from the surface the diameter of the pipes was reduced to 9in. At 122ft. 6in. an analysis of the water showed 481·33 grains of solid matter per gallon, 66·60 grains of volatile organic matter, and 347·61 grains of chloride of sodium. Proceeding still through alternations of several varieties of sand and clay, the boring reached a depth of 157ft., where dark sand and pebbles with shells, forming the basement bed of the Woolwich and Reading beds, were encountered. Thence the boring passed through more sand and clay to a depth of 268ft., where a bed of green-coated flints was reached, forming the basement bed of the Thanet sands. Beneath this came chalk, into which the tubing was carried for a depth of 40ft., from which point the work was continued in open boring 6in. in diameter to 360ft., where flint water-bearing veins were met with. Here the solid matters had become reduced to 43 grains per gallon, the volatile organic matter to 1·95 grains, and the chloride of sodium to 17·32 grains. Several varieties of chalk and flint veins were then passed on the way down to 572ft., at which point an ample supply of excellent water was obtained. The analysis here showed solids 43·76 grains per gallon, volatile organic matter ·20 grains, and chloride of sodium 16·38 grains, the water having a hardness before boiling of 9·3deg., and of 5·7deg. after boiling. Albuminoid ammonia was entirely absent. A supply of 26,000 gallons per day is at present obtained, but this supply can be increased with the present machinery if required.

The London Water Supply.—Dr. Farr and Mr. Edwin Chadwick having fully investigated the metropolitan water-supply, and the terms for the public purchase of the undertakings of the trading companies now supplying the metropolis with water, have embodied their suggestions in a report recently presented to the council of the National Association for the Promotion of Social Science. The report states that, by the evidence of competent witnesses, the greater part of the present companies supply water of an inferior quality. London (inner circle), according to Dr. Frankland's testimony, was supplied during the past year by eight companies with a daily average of 129,657,848 gallons of water. Of these 65,063,839 gallons were often much polluted with organic matters of animal origin; 56,501,022 were occasionally so polluted; while only 8,092,987 gallons were uniformly in a pure and wholesome condition. Parliament has given the water companies a monopoly under which they have the power to supply the metropolis with bad water and to levy rates in the metropolis which would return 10 per cent. on their share capital. The terms of purchase already settled by Parliament in the case of provincial water companies are 25 years' purchase on the highest net dividends earned, with an allowance for compulsory purchase, and also on arbitration an allowance for prospective advantages. The defects of the present system are briefly summarised:—First, in the defective conditions of intermittent supply and delivery by stagnant detentions in cisterns and butts in close places, where the water is de-aërated of the air at the source, and absorbs the gases of putrefaction of cesspools, bad drains, sewers of deposit, and of middensteads, and is besides elevated in temperature. This renders the water repulsive and unpotable, and, as a general fact, water so delivered is not habitually drunk as it might be by the wage classes of the community. The inference to be drawn from this is that they drink beer, and thus the bad water supply and storage becomes a direct incentive to drunkenness. Secondly, in the present condition of delivery there is a waste of upwards of three-fifths of all the water pumped into the metropolis; and, lastly, the conditions of the distribution on the intermittent system for a trading profit, and not as a public service, obstruct the due provision by means of hydrants under the charge of the police for the prompt extinction of fires, occasioning nearly threefold greater losses of life and property in the metropolis than in such large provincial cities as Manchester, Liverpool, and Glasgow, where improved systems on a public footing have long obtained. By the purchase of the companies an economy of upwards of £100,000 per annum in the expenses of administration, derivable from consolidated management on a public footing, would be effected, and from this it is estimated the requisite house services might be altered to receive the constant supply, and the streets hydranted completely for protection against fire and cleansing the streets, without any additional charge to the ratepayers. The report concludes by urging the purchase without further delay. In 1850 the works might have been purchased for £6,000,000. An improved system of extended distributory apparatus for the whole of the metropolis in its present magnitude is estimated at £8,000,000; but the present cost of the undertaking is estimated at £26,000,000; and at the same rate of progress it will in another decade amount to £37,000,000.

LEGAL INTELLIGENCE.

Alleged Conspiracy by Builders.—At Ilford petty sessions, on Saturday week, Benjamin Charles Sambell was charged on remand, with stealing from the Grove-park estate, property to the value of £120, belonging to Mr. G. W. Marsden, junr., solicitor, of Queen-street, E.C. The prisoner was also charged with Alfred John Simmons on a warrant with conspiring to obtain goods by false pretences from a number of tradesmen. It was stated that the prisoners Sambell entered into a contract to finish certain houses on the Grove-park estate, Walthamstow, and on the faith of carrying out the work, obtained advances of about £1,300. Prosecutor finding the work was not being carried out as expected under the agreement, took possession, and then the prisoners removed a quantity of building materials. Mr. Hilde, manager to the Surrey Canal Saw Mills Co., Hatcham, S.E., stated that the prisoner Simmons came to him, and ordered a quantity of building materials to be sent to the Grove-park estate, but he refused to supply them to an ordinary builder. Sambell was then introduced as the owner of the houses on the estate, and on that representation the goods were parted with. A remand was asked for on the ground that a number of other cases would be gone into, in which other parties were likely to be implicated. The application was granted, no bail being allowed to prisoners.

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The Corporation of Dublin have decided, in consequence of the limitations to loans which will be enforced by the clumsily-conceived new Public Health Act, to make immediate application to the Local Government Board of Ireland for a loan of £100,000, in order to complete the paving of the city.

Our Office Table.

The penny-wise policy of churchwardens which allows lofty towers to remain exposed to the risk of injury, in order to avoid the expenditure of a few pounds on lightning-rods, deserves more frequent exposure. On the closing day of the Archæological Associations Congress in Norfolk, at Cawston Church, Mr. Geo. Wright, F.S.A., referred to the recent destruction by lightning of the fine church of Wells-next-the-Sea, adding that neither on the magnificent tower of Salle Church, just visited, nor on that of the edifice in which they were assembled was there a conductor. He had been struck during the Congress with the general absence of this protection against injury, the more necessary because the church towers were frequently very large, and set on the tops of hills; in several cases they had seen towers which had been injured by lightning, and he strongly urged the clergy and churchwardens throughout the district to take steps to prevent the recurrence of disasters such as had just befallen Wells.

The London Street Tramways Company are about to run on their system of lines, all on the south of the Thames, a number of one-horse cars, of the American pattern. There are no outside seats, no conductors, and no passenger tickets. A money-box with tell-tale bell, is to be provided at the end of the car, in which the required fare will have to be deposited, and any change required must be given by the driver. The experiment will first be made on the Clapham and Borough service, on which a uniform 3d. fare will be made. The mules, by which this company has recently replaced their stud of horses, appear to do their work satisfactorily. The cars running between Westminster and Blackfriars Bridges and New Cross, *viâ* Camberwell-green, have been provided with awnings, increasing the comfort of outside passengers in this unsettled weather.

Mr. W. St. Chad Boscawen, a young but well known Assyriologist, is about to visit Asia Minor, for the purpose of collecting inscribed tablets and other antiquities of that country. Mr. Boscawen will act as the representative of a committee who have charged themselves with the equipment of the expedition, and his investigations will be periodically brought by public communications to the knowledge of scholars and others who are interested in his labours. Mr. Boscawen's work, although independent of the British Museum authorities, will be in close sympathy with any operations they may direct to be carried on by Lieutenant Kitchen or any other commissioner. For the present it is possible that Mr. Boscawen will confine himself chiefly to the work of collection and decipherment, without any design of carrying out Mr. Rassam's incompleted work of excavation. To this business, however, it is probable that his commission will be ultimately enlarged.

An inquiry as to the amount of compensation to be paid by the Metropolitan Board of Works to the Wandsworth-bridge Company for the acquisition of Wandsworth-bridge for the free use of the public (under the provisions of the Metropolis Toll Bridges Act, 1877) will be commenced at the Surveyors' Institute, Westminster, on Monday, October 20. Mr. Meadows White, Q.C., and Mr. Littler, Q.C., will be the arbitrators, the former for the Board of Works and the latter for the Bridge Company; while Sir Henry Tyler has been nominated by the Board of Trade to act as umpire. Sir Henry James, Q.C., and Mr. Philbrick, Q.C., will be the counsel for the Metropolitan Board of Works; and Mr. Webster, Q.C., and Mr. Batten will represent the Bridge Company. Waterloo, Charing-cross, Vauxhall, Lambeth, Chelsea Suspension, Battersea, and Albert bridges have already been thrown open to the public by the Metropolitan Board of Works, leaving Wandsworth, Putney (otherwise Fulham), Hammersmith, and Deptford Creek bridges to follow, to complete the last of metropolitan bridges scheduled in the above-mentioned Act to be freed from toll.

The members and associates of the Society of Engineers visited, on Tuesday, the works which the London and St. Katharine's Dock Company are now carrying out for the extension of their Victoria group of docks. The dock now being formed will be one of the largest in the world, and will cost nearly three-quarters of a million sterling. The large basin of the new dock is 6,500ft. long, 490ft. wide, 32ft. deep on an average, 80 acres in area, and capable of allowing ships of first-class size to turn round in it. The walls, like those of the entrance basin, are of solid concrete, built not on the gravelly bed of the dock, but on the chalk from five to ten feet below. Adjoining are two dry docks, respectively 550 and 600ft. long. A passage 180ft. in length, where a pair of iron gates weighing 160 tons will be placed, leads from the large basin to the entrance or tidal basin. Across the top of it lies the *bête noir* of the engineers and contractors in the shape of an iron swing bridge, 350 tons in weight, which carries a public road called the Manor-way. The tidal basin itself measures 1,000ft. by 700ft., the depth being 30ft., and the area 10 acres, as much as the whole of St. Katharine's Dock. Beyond this point the engine and trucks could not go, and the visitors had to slight and wade through the water in the entrance lock to the top of the earth embankment which keeps the river out of the works. The lock is 750ft. long, 80ft. wide, and able to hold 30ft. of water at high tide. Its iron gates are three in number, with jetties stretching out into Galleon's Reach, and run on rollers which, by a special arrangement of Mr. Rendel's, are directly beneath their centres of gravity. In making the new dock 4,000,000 cubic yards of earth have been excavated; 350,000 cubic yards of concrete, including 70,000 tons of Portland cement, have been used, and when it is finished, as it is expected to be in about three months, it will contain 20,000,000 bricks. The Victoria Docks, with their locks and connecting passages, will then stretch in a straight line for three miles, and the new portion will be able to find berths for 30 ships of 3,500 tons burden at one time.

The Severn Railway Bridge, which is only surpassed in length by the new Firth of Tay Bridge, has just been completed. It was designed by Messrs. Geo. W. Keeling, M.I.C.E., of Lydney, and Geo. Wells Owen, C.E., of Westminster, and has cost £200,000, while the approaches will cost an equal sum. The total length, including the masonry viaduct on the north side and the swing span over the canal on the south side, is 4,162ft., and it contains 7,000 tons weight of iron. The spans of the bousting girders from the Lydney end are, from centre to centre, one of 134½ft., two of 327ft. each, five of 171ft each, and thirteen others of 134ft. The line is a single one, with the exception of the swing bridge over the canal, where it is doubled.

We are glad to learn that the vicar of Arundel, the Rev. G. Arbuthnot, has given notice of appeal against the decision of Lord Coleridge in the late suit touching the chancel of Arundel Church. The effect of that judgment is to hand the chancel of Arundel Church over to the Duke of Norfolk as his private property, in the same sense as any part of Arundel Castle. The Duke may, if the judgment stands, employ this chancel for any purpose, as he has now separated it by a thick wall from the nave for the first time. The principle involved in this act is, as the *Guardian* this week points out, and, as we intimated in May last when reviewing the case, of such wide and dangerous application that the vicar of Arundel, in vindicating his own and the parishioners' claims to be allowed, subject to the ordinary rectoral privileges, to use the chancel of their parish church, is really fighting the battle of all parishes at all similarly situated. Mr. Arbuthnot is advised that he has very good grounds of appeal.

Holloway's Pills are suitable alike for the peer and the peasant; the soldier, sailor, and emigrant may rely on them as the means of banishing sickness in all climates, and under all circumstances. They readily check bilious and feverish attacks, and prevent inflammation of the brain, liver, lungs, and kidneys.—[Advt.]

CHIPS.

The parish church of Shipton Bellinger, Hants, has just been reopened, after restoration from the designs of Mr. R. J. Withers, of London, whose drawings of the church we published on March 21st last. The work has been carried out at a cost of £1,560.

The high bailiff of Leicester, Mr. Israel Hart, has presented to the town a handsome fountain, which is being erected in the Town Hall-square. The town council have voted £1,300 for the square to be laid out with plants and shrubs.

The town council of Lincoln recently received tenders for a pumping station and other sewerage works to be carried out from the plans of Mr. Mansergh, C.E.; the lowest being that of Messrs. Kelley and Bentley, £2,704, and the highest that of Messrs. Barnes and Wright, £3,855.

The Blackburn School Board have accepted the tender of Messrs. Holt and Kenyon, amounting to £5,327, and being the lowest received for a new school to accommodate 750 children in Moss-street, in that town.

The foundation-stone of a spacious Masonic hall and other accessory premises was laid on Saturday in Belvedere-road, Lambeth.

The guardians of Lambeth have decided, subject to the approval of the Local Government Board, to add another story to their workhouse, from designs to be prepared by their architects, Messrs. Fowler and Hill. Provision for this was made, it was stated by the chairman, in the thickness of the walls when the workhouse was built.

A scheme has been prepared by Mr. Barnes, C.E., engineer to the Kingstown Commissioners, for the drainage of Monkstown and portions of other districts by means of an outfall at the West Pier.

The Wolverhampton Tramway Company's system was on Tuesday extended from Bilston to Moxley. The engineer of the new line was Mr. Kincaid; the contractor, Mr. J. F. Meston, of London; and the clerk of works, Mr. Kempthorne. The rails were manufactured at Rhymney, near Merthyr.

An exhibition of library designs and appliances is being organised in connection with the second annual meeting of the Library Association, to be held at Manchester Town Hall on the 23rd, 24th, and 25th September.

The tenders of Messrs. W. Bamber and Son, plumbers, painters, and glaziers, Wainfleet, have been accepted for the execution of works at the Lumley Hotel and the Estates Offices, Skegness-on-Sea, for the Earl of Scarborough.

The contrast for reseating the church at Fleur-de-lys, near Bargoed, has been let to Mr. T. Williams, builder, of Cwmdow. The present rail-back seats are to be replaced by open-ended pitch-pine seats.

The sixth general meeting of the Dublin Artisans' Dwellings Company was held on Friday. It was announced that the houses belonging to the company let easily, and that further buildings in Manor-street, to cost £100 each house, are in progress. A dividend of 4 per cent. per annum was declared, and it was explained that money equal to an additional 1 per cent. was perforce lying idle in the bank in connection with the development of the business.

A special meeting of the shareholders in the Lincoln Brick Company, Limited, was held at the Guildhall, Lincoln, on Thursday, the 21st inst., "to consider a report from the shareholders' committee, and also to decide—(1) whether the business of the company shall be continued, and if so (2) whether any, and, if any, what additional capital, bearing a preferential or guaranteed dividend, shall be created; or (3) whether the company shall be at once wound up, and a liquidator or liquidators appointed." It was decided by a large majority of votes to continue the business, and to effect certain alterations recommended in a special report by Mr. Whitehouse, the manager of the Nottingham Builders' Brick Company, who had been jointly nominated by the committee and directors.

The question whether the appointed architect or the board should receive tenders was raised at the last meeting of the guardians of St. Olave's, Southwark, a Mr. Beresford having inquired who gave Mr. Saxon Snell authority to receive the tenders for the water-tanks at the workhouse infirmary. After some discussion the minutes were referred to, when it was shown that instructions were given Mr. Snell by the board, on the recommendation of a committee, to obtain the tanks at scheduled prices. Although Mr. Holmes and others pointed out that this settled the matter, for the architect had been given authority for the course taken, the clerk was directed to write to Mr. Snell for an explanation. This is but a sample of the mode in which architects to boards of guardians are badgered by men who seem to know nothing of the ordinary routine of building matters.

A new swivel bridge, to be known as the "Beresford Bridge," over the Liffey, was transferred on Tuesday from the contractor, Mr. W. J. Doherty, to the Dublin Port and Docks Board.

The foundation-stone of a new tower for Bathford church, near Bath, was laid on Monday.

The choir of St. Paul's Cathedral is being laid with marble to correspond with the nave.

On Friday the foundation-stone of a new church for German parish, Isle of Man, was laid.

A new lifeboat-house has just been erected at Dover for the National Lifeboat Institution. It is a substantial and handsome building, with sculptured stone in the front, and has been built by Mr. Adcock, contractor, of Dover.

The Birmingham glass trades union has been dissolved.

Another new school was opened by the London School Board on Monday week. It is situate in Gillespie-road, Blackstock-road, N.; and has been built from the designs of Mr. E. R. Robins, architect to the Board.

A public mortuary is being erected for the Hornsey and Crouch-end Local Board, under the superintendence of Mr. Rogers, their surveyor. Messrs. Southcott and Co. are the contractors.

A new aisle just added to Holy Trinity Church, Folkestone, was opened on Sunday.

The local board of Leyland, near Preston, have requested Mr. Tomlinson, C.E., to report on the best means of getting a good water-supply for the district.

Mr. H. Inwood, formerly surveyor of Hornsey, was found dead in bed the other morning.

The foundation-stone of a new church was laid at Peel, Isle of Man, on Thursday week. The building, which will be in the Early Decorated style, will be erected from designs by Messrs. Thos. D. Barry and Son, architects, of Liverpool, and will accommodate 900 persons, at a cost of £5,000.

The foundation-stone of a new Primitive Methodist chapel, at Hereford, was laid on the 18th inst. The style of the building will be Early English. Mr. Lewis Powell, of Hereford, is the architect, and the cost, inclusive of site, will be £3,555.

In consequence of a determination on the part of the corporation, that it is desirable that the town surveyor should devote the whole of his time to his public duties, Mr. John H. Abbey, the borough surveyor of Huddersfield, has resigned that appointment.

The parish church of St. Bartholomew, Tardebigge, was reopened, after extensive repairs and alterations, on Friday. A new chancel has been built, 30ft. long, terminating in an apse. The nave has been furnished with new open seats and encaustic tile floor, the two side galleries are taken away, and the organ has been removed from the western gallery to the chancel. The work has been substantially carried out by Mr. T. Collins, Tewkesbury, under the direction of Messrs. A. Rowe and Sons, architects, of Worcester.

According to the Board of Trade Returns, the importations of timber into the United Kingdom in July, 1879, were 797,818 loads, which, compared with the returns for July, 1878, showed a deficiency of 216,215 loads. Over the seven months of 1879 there has been a deficiency of 829,538 loads.

The little village church of Guilsford, in Montgomeryshire, has just been reopened after restoration, at a cost of £6,000, from designs by Mr. G. E, Street, R.A.

The ecclesiastical commissioners have made the following grants for improving parsonage houses in West Kent:—Sheldwick, £600; St. Paul's, Chatham, £22; and Preston-by-Faversham, £400.

The church of St. Mary-le-Elms, Ipswich, has just received two stained glass windows in memory of members of the Walton-Turner family. The subjects are Faith, Hope, Charity, and Mercy; and the work has been executed by Mr. W. G. Taylor, of Berners-street, W.

The first section of the Lynn and Fakenham Railway, that from Lynn to Grimstone, Hillington and Massington, was opened on Saturday week.

A new Wesleyan chapel has been recently opened in Broad-street, Ludlow. The design is in the Italian style, the front being liberally treated with Bath stone dressings. Mr. Ranger, of Finsbury-pavement, is the architect, and Messrs. Nevett, of Iron-bridge, the builder. The entire outlay, including site, will exceed £4,000.

The Llanelly board of health, at their last meeting, appointed Mr. George Watkeys as town surveyor at a salary of £1,175 a year.

A new church has been consecrated at Sawley by the Bishop of Ripon on the site of a chapel built by the Abbot of Fountains, and pulled down about 110 years since. The cost of the new church was £2,000.

A new hotel is about to be built on the site of part of the York Hotel, Hastings, recently removed by the town council for public improvement. The plans have been prepared by Mr. W. L. Vernon, of Hastings, and will cost about £3,000 for execution.

The French Archæological Society, founded by the reviver of antiquarian studies in France, M. de Caumont, will open their forty-sixth session on September 2. Vienne, the ancient capital of Dauphiné, a very mine of Roman remains, is the place selected for the centre of operations, from which excursions will be made in various directions.

Business is reported by the *Echo* as decidedly reviving in Paris. Building is said to be brisk, and painters have as much as they can do, a good deal of work having fallen behind in consequence of the unfavourable weather of the summer.

Lamplough's Pyretic Saline is Refreshing, most agreeable, and the preventive of Fevers, Biliousness, smallpox, skin diseases, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[Advt.]

Trade News.

WAGES MOVEMENT.

Bristol.—The joiners and carpenters have followed the example of the masons, and the strike in the Bristol building trade is now practically at an end, a large number of the men having returned to their work at the halfpenny per hour reduction. The notice of reduction was given by the employers in November last.—On behalf of the strike committee the above statement has been denied, it being alleged that more than 700 carpenters and joiners are receiving the old rate of pay (7½d.) while about 70 men are still on strike.

Burnley.—The master joiners of Burnley have given notice of a reduction in the wages of journeymen of ¾d. per hour, to come into force on the 1st September. The present wages are 32s. 6d. per week, and the reduction will be equal to 3s. 3d. per week, thus leaving them at 29s. 3d. per week. The workmen have decided to oppose the reduction. There are about 300 joiners in the town affected by this reduction

Glasgow.—A meeting of Glasgow masons was held last week, when it was reported that the employers had notified a reduction of 1d. an hour, making the wages now 6d. per hour. In addition to this, the employers intimated that after this month they would discontinue the weekly and return to the system of fortnightly pays. This latter question, it may be remembered, was keenly fought and gained by the men some years ago. At last week's meeting they agreed not to resist the reduction, as the condition of trade all over the country was in such a depressed state, but they resolved to appoint a deputation to wait on the employers with the view of inducing them to continue the weekly pays. On the question of reduction, the masters refused to hold any conference, stating that the decrease was imperative.

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TENDERS.

Accrington.—For new post office and shops, &c, Church-street, Accrington, for Mr. Edmund Riley. Mr. George Baines, architect :—

Excavator, waller, bricklayer, and mason :—

Edwards	£1,100	0	0
Riley, J.	1,000	0	0
Ramsbottom	956	5	1
Abbott	950	0	0
Waddington	882	0	0
Cronshaw	875	0	0
Cunliffe (accepted)	870	0	0

Carpenter and joiner :—

Ramsbottom	£843	15	0
Abbott	840	0	0
Turner	747	0	0
Roberts	710	0	0
Balmford	674	0	0
Waddington	650	0	0

For rolled iron girders and cast-iron columns, &c. :—

Watson and Wormwell	£160	0	0
Hudson	159	17	3
Mercer	152	16	9
Williams	118	15	9
Homan and Rogers	116	0	0
Bridge (accepted)	114	3	0

For girders only :—

Baldwin	£159	0	0

Accrington.—For new printing offices, Accrington, for Mr. E. Bowker :—

Cunliffe	£215	0	0
Ramsbottom	195	0	0
Waddington (accepted)	176	0	0

Barroway Daove, Downham Market.—For the erection of a mixed school and offices, for 80 children, and teacher's residence. Mr. Walter Robinson, architect, Ely :—

Fryer, Wereham	£1,098	0	0
Bennett, Downham	986	0	0
Daws, Lynn	925	0	0
Porter, Southery (accepted)	868	10	0

Basingstoke.—For the erection of a steam laundry and stable, for the Basingstoke Steam Laundry and Baths Co. (Limited). Messrs. Hugh E. Raynbird and Sons, architects, Basingstoke. Quantities by the architects :—

Batten, Overton	£2,265	0	0
Blunden, Basingstoke	2,220	0	0
Kent and Lunn, Basingstoke	2,105	17	6
Goodall, Worting	2,096	18	0
Wilkes	1,998	16	6
Sims, Bros., Basingstoke	1,977	0	0
Batten, Southampton	1,961	11	0
Tigwell, Basingstoke	1,941	16	0
Pelham, Basingstoke	1,932	13	0
Jennings, Basingstoke	1,915	0	0
Mussellwhite, Basingstoke	1,879	0	0

Bedford.—For a villa residence, The Plantation, near Bromham-road, for G. E. Fasnacht, Esq. Mr. F. J. Mercer, architect :—

Spencer*	1,120	0	0

* Accepted, subject to certain alterations.

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N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 5, 1879.

THE WOOD MARKET OF EUROPE.

THE French Government has issued a commission, so instructed as to create no alarm on the part of the great interests involved, into the actual state of the timber market, both in France and in the other countries of Europe. The subjects propounded for investigation, however, are in many respects unwise. The questions involved in them go, indeed, far afield—What is the influence of wood upon architecture? what proportion of the earth's reproductive forces are absorbed by it? what qualities are most enduring, resistive to water, fire, and time; and how far they may be preserved by artificial processes? These, indeed, are only a few among numerous problems suggested of a scientific and historical character. Thus, the comparative merits of wood and stone in the construction of baths; the judgment of the Norwegian and Swedish builders in their constant use of this material; the recent preference given in France to oak as against pine; the diminution, scientifically brought about, in the natural combustibility of the timber; with the large diffusion of its use in pavements, gutters, piles for substructures, window-frames, where stone was formerly employed, bridges, and architectural frames. It would, in fact, engage the industry and the intelligence of an educated lifetime to write the history of wood. It meets us everywhere—in the pavements of Greece and Rome, as in those of modern London, in the Athenian as in the German temples, in Grecian altars as in Spanish shrines. We find it, in fact, as the material of an imperial palace, and as that of a turf-cutter's cottage. Of course, this influence is a strong one in the industrial markets of Europe. One of those Frenchmen who consider themselves artists wrote not long ago—"the English savages, profiting by their enormous forests, and scarcely distinguishing between oak and deal, built up the monuments which, in aftertime, became cathedrals and castles." Let us pass the sneer, and accept the compliment. What we have to do with now is the part played, so to speak, by wood in historical architecture. Is it not found, prominent and conspicuous, in all our historical structures? Does it not take its rank side by side with marble and stone? Why, in modern ages, stone and marble were innovations. The earliest churches of London, Edinburgh, and Paris, with their castles and palaces, were wooden, like the chapels of Sweden and Norway, just as the mansions of the English nobility were, until brick-work came in vogue. The mansions of the nobility in Sweden are, as a rule, wooden, like those built by the emigrants of North America and Upper Canada—which resemble, in some respects, the cottages of a Russian colony. They are all of wood—wood is everywhere; it is the castle, the palace, the fortress, and the church. Among the monuments of the 13th century, none are more remarkable than its ogival churches (one of which is delineated elsewhere in this issue); constructed entirely of deal, with its palaces of the same material, into the erection of which "not an ounce of stone" was ever admitted. All was timber—foundations, floor, staircase, wall, roof, chimney even, and burnings-down were, accordingly, frequent, to the infinite detriment of art, though to the great advantage of the market. For, strange though it may appear, the prospects of this have considerably improved; a timber revival, as a matter of fact, has taken place; yet not without a stiff struggle between the two classes:—those who quote antiquity, who insist upon practical experience, and who urge the use of incombustible washings; and those who care nothing, for either safety or danger, so long as the precedents of Strasburg, Limoges, St. Sebastian, and Charenton-le-Pont are followed. Now, whence comes all this wood? In immense quantities, no doubt, from the North; but France, of late years, as we have said, has learned to prefer oak before deal, both for building and furniture; and the multiplicity of her inventions for securing its durability, in all climates, and for all uses, is remarkable. So, she has searched the markets of the north, and her southern ports are full of their produce. The Commission, however, to which allusion has been made, is charged with certain special questions of interest to the whole world:—What (for example) are the influences upon architecture of an abundant timber growth? what amount of moisture it draws down, and what amount, at the same time, it absorbs? which qualities are the best to cultivate? and to what purposes, in rivalry with stone, they had better be applied? One point submitted to the Commission has already, it may be said, received a partial answer. This applies to the preservation, elasticity, inflammability, and colouring of wood. The French, at any rate, claim a process by which they can petrify timber in presence of fire, while they preserve all its other qualities as a material for building. They, however, deny, upon the whole, that we, in England, have brought into our wood-market any practical guarantee against fire. But, of course, they are envious of our oak, with which they have nothing to compare, and which all their architects, builders, and furniture-workers "in the solid" are importing. Their principal materials, of home or domestic growth, are cedar, ebony, pear, and pine, treated by every conceivable process; of smoking, creosoting, drying, burying in the earth, soaking in the water, and furnace-heating, until it becomes yielding as putty. Still, the great contractors of the late war urged there were disadvantages connected with wood, and they gave it up, for many reasons, in its competition with iron. It was not good for pile-driving, and it was not good for stage-planking; therefore, it was not good at all. Notwithstanding these objections, however, it was found to be indispensable, and the wood-market never stood so high as after the claims of timber had been condemned. Especially, says a French writer, in London, for purposes of paving: "Wooden pavements have had a greater success in London than in Paris, and this is, to a certain extent, explainable; the pavements of the London streets are, as a rule, larger than ours; foot-passengers rarely make use of them beyond the kerb-stone; there is less noise; and the wooden pavement is, as a consequence, comparatively safe." We hardly follow this argument to its conclusion, but it explains, nevertheless, a large demand at present being made by important French commercial cities upon our wood-supplies, which are, of course, vastly inferior in quantity, if not in quality, to those of the Black Forest, and the immense shadowy timber-lands round about the Baltic and the other northern seas. It is useless to attempt to compute them; they are endless; the only limits are those of labour and demand. We might as well attempt to penetrate the centre of the earth as to measure the capacity of the carpenter's workshop in a Norwegian wood.

Still, many prejudices have to be contended against by the workers in this measureless wood-market of Europe. As to pavements of streets, says M. Daly, there has always been a strong opposition in France in favour of oak against pine, the former being better adapted to bear friction; but the principal authority upon these matters in France is nowhere when he talks about them relatively to England. It is like a child, with a fifty years' old memory, reciting some legend of the New Museum at Florence. We, however, are keeping to wood, and the part it has played in the architecture, general arts, and general life of the world. Now, where upon earth could be found a more delightful little domesticity than that of Montluçon, dating from the fifteenth century, constructed entirely of sweet pine, with not a hod-full of mortar or brick about it? It has a beautiful Gothic doorway, a broad ecclesiastical window, a first-floor façade full of elegance and taste, and a rejoining gable, with not an ounce of clay in the whole composition, and yet it seems destined to survive for ages. We must not suppose that, where wood was employed, architecture suffered. On the contrary, wood was the architect's first material, and, therefore, first necessity. It was nearer to his hand than marble or stone. We find around other examples of carving in this substance; we trace it through the ascending periods of architecture. It begins with the wooden staircases and banqueting-halls of the countries wherein Art had its second birth; and it has, perhaps, its highest illustration in the ogival windows of Argua—wooden, all, like those of the house of Montluçon. "Evidently," says the describer of these monuments, "wood adapts itself in the best way for all these purposes. Its growth and its fibres belong naturally to Art; it is ogival in its very nature; it cannot, anywhere, be out of proportion; it is, indeed, an everlasting combination of itself." Without going so far, it may be admitted that the wooden palaces of the fifteenth and sixteenth centuries were marvels, which have since been neither surpassed nor paralleled. They were, in fact, examples for the builders in stone; they illustrated the highest mechanical and physical laws; and above them arose not a few among the mightiest works of modern architecture. There may be a dispute about this; but it is always good to remember that, where Hippocrates said "Yes," Galen said "No." The controversies of science, and the contradictions of of history, are both equally valuable. It has been shown that, both in extreme Northern and in extreme Eastern climates, and in the tropics above all, wooden habitations are favourable to comfort and life. Churches constructed of this material are now preferred to those of iron at the missionary stations of the Pacific. And, in association with these facts, we discover some others which are, perhaps, although they may appear to range in a kind of contrast, equally remarkable. The very wood-pavement—which prevents the feet of passengers from blistering—round the cloisters of St. Denis, serves the same end for the loiterers under the arcades of Pekin. In both of these places indeed, far apart as they are situated, the same processes are tried for the preservation of wood, since it has been universally felt that no forests upon earth can for ever sustain the terrible drain which is made upon them from year to year. The forests of Europe, and of European Asia, as it is called, are rapidly disappearing, with no possibility of renewal; the historic forests of Greece and the Euphrates valley are gone. In spite of iron, wood is still made use of in ten thousand ways. We cannot supersede nor despise it, do what we will; we bend, turn, twist, and coax, and coddle it into our service, and then, we think that the supply is failing. This, perhaps, is a little ungrateful on the part of that mankind which, hitherto, has made so much of wood—"walls" of it, every article of domestic utility of it, houses and churches of it, before iron came in—railings, palings, pavements, everything of it, until the market we are speaking of became actually a resort of fine-art connoisseurs. For whither did the mediæval carvers go for materials of work, if not to the pear orchards of Charenton-le-Pont, whose trees they cut into beautiful window-frames for old Latin basilicas, for tenth-century Merovingian chapels, for Gothenburg churches of five hundred years ago, for pulpit adornments at Peryota, and sacred staircases at Saint Sebastian? This pear-tree has done duty for a cedar, oak, pine, and even ebony, at the castle of Bracewell, and at the chateau of Quentin-Delatuer. No matter, it is a beautiful, and, so to speak, a plastic wood, capable of all imitations. M. Sirodot, in fact, compares it, in point of strength, with cast, and even with wrought-iron. And he, with deep ingenuousness, gives a receipt for converting it into the likeliness either of Lebanon cedar, or Brazilian ebony, which, among the modern arts, is one peculiarly profitable to cultivate. Ebony, as is well known, is a kind of luxury in the market. It is, as the encyclopædists would say, a wood remarkable for its hardness, heaviness, and dead-black colour, a "heart-wood," as it is called, characterised by a deep uniformity and density of colour, with logs often 2ft. in diameter, which, when they come—which is not often—into the market, create an extraordinary competition, among cabinet-makers especially, who use their broad, thin plates sliced down for veneering. Greek and Roman artists used it thus, in comparison with ivory, for the sake of contrast, and its employment in this way is largely illustrated in almost every gallery of Europe. But this, of course, is a very secondary consideration with those who are interested in the general question of the timber produce of Europe—whether it is increasing, diminishing, or likely to be kept up, within a period upon which living generations have any right to calculate, upon a level with the demand. They have nothing to do with art or its necessities, which can be answered by a very small supply, although their meaning in the market is by no means to be despised, as several French authors minutely show when they compare by weight the merits for these purposes of oak, pine, cast, wrought, and forged iron, "in all their prismatic forms." It is, indeed, curious, and not a little interesting, to observe the varieties of this immense wood-market, as relating to the demand for piles, pavement, or house-building, for cottages or garden structures, for toys, imitations, or sculpture. Reading the history of this world-wide spread material, indeed, it would almost be possible to imagine that amid the long list of human necessities, natural or artificially created, none existed requiring the use of marble or stone, so far and so various was the woodwork to the use of which mankind in all ages have resorted before marble was quarried or bricks were baked. Yet, though woodwork could not prevent masonry, masonry could never put woodwork in its thousand uses out of sight, because, as the Arts grew, one in presence, neighbourhood, and partnership with the other, it became manifest that, as architecture is said to have been suggested by the forms of the forest, so it went to the forest after the quarry for its materials, and thus between them evolved the myriad shapes and uses which we see, competing in the markets of hardware and woodwork in the world.

PURITY AND EXAGGERATION IN ART.

THERE is always a wide distinction to be drawn between a work of art which pleases and one which merely appeals to the proclivities of a fashionable taste. In the art of painting there will always be found, whether from conscientious conviction or mere affectation it would be difficult to decide, connoisseurs who avow a fancy for the impressionist or the pre-Raffaelesque school. They prefer the dreamy suggestiveness or mystical power of a Whistler to the classic purity of Leighton or the finish of Alma Tadema. They affect to like something which is rather beyond the popular grasp, which cannot be comprehended at a view or even appreciated by the ordinary picture admirer. It must, at all events, be something occult—eluding the average capacity of artistic discernment—it must represent a deeply-involved plot, be intensely exaggerated in sentiment, or paradoxical in colour and light and shade. "Extremes meet," and there will invariably be found those who can see in such a picture an extraordinary power in composition or colour. By those who cultivate the other artistic sensibilities we have hinted at, an equally intense enthusiasm is manifested for something crude or positively ugly in form, proportion, or colour; so much so, in fact, that we find our manufacturers of revived fabrics vieing with each other in the production of the most far-fetched conceits, the quaintest and most grotesque patterns, and the most incongruous of harmonies. For example, let us take textile fabrics or wall papers. Chevreul, Owen Jones, and our most advanced authorities on chromatics have long ago demonstrated the incongruousness of such mixtures as blue and green, green and yellow, red and violet, or shades of brown and yellow, used in combination. As if in opposition to the prismatic doctrine of the colour harmonies, we now see hangings of all these hues in varying tones blended together, and, strange to say, we have lately been brought to the point of discovering only beauty and good taste in these tints. Our taste thus eludes scientific law, and would appear, indeed, to defy any strict canons, so easily perverted may judgment become. Turning our attention to architecture, a similar violation of all rules distinguishes a school of designers which prides itself upon having upset every canon of Vitruvius and Vignola. Where deference to the principles of these teachers taught architects to proportion their "orders" and to dispose them with some regard to gradation, order, and symmetry, to place column above column, and opening above opening, and to break and vary their façades with an eye to balance and rhythm, we find now a band of designers inculcating principles diametrically opposed to, or, rather, enjoining the subversion of, every rule of architecture. They tell us that real art-building is in allowing free rein to the imagination, in grouping and massing our houses after the manner of those picturesque combinations of a previous age which they have taken as models. They would add to or develop from these as germs for all our public and domestic wants in the future without a thought of making the external form depend upon plan or an organised programme of that which is really necessary to a building. The designs submitted in competition for our town halls and public schools, of which we have had recent experience, may, according to the light of these artists, assume the appearance of domestic buildings or churches without any incongruousness. Type, as springing out of the apartments necessary, is disregarded, and the structure and functions of such features as gables, oriels, bays, and turrets completely ignored, in spite of the fact that every one of these things had its original purpose and function derived from necessity or habit. To mask a chimney shaft and make it wear the garb of a campanile, as in one well-known instance, is clearly the result of the custom we are censuring of not distinguishing clearly between types as the outcome of certain functions. Misappropriation is one of the most glaring faults of our architecture, but can we wonder when we find artists setting aside all restraint and drawing without reserve from their fancy. Freedom in details has at length lapsed into license, and artists exult in a sportive kind of composition, which, while it enlists the admiration of some, does not tax their powers of designing in obedience to the rules of art.

The Jacobean style of building is a particularly pliant mode of arranging our houses, but there is no necessity for making it so extremely grotesque or capricious as many of its votaries have done under the belief that the essence of the style lies in its eccentricity. The popularity of this fashion resides, no doubt, in the facility it affords for planning domestic apartments and the employment of brick. Its thorough English sentiment and its costlessness, compared with Domestic Gothic or Italian, have been much in its favour, and we should be sorry to see it forced into the service of municipal and otherwise public requirements. The architecture of Elizabeth and James I. was characteristically domestic and pictorial, though occasionally affected and given to the conceits of the age; it was always true to the English sentiment, for it must be remembered this period was notably the great house-building one, as the previous had been entirely ecclesiastical. When we, therefore, see architects taking bits from Wollaton, Aston, Haddon, Hardwicke, and tacking them together to produce a melange; and then applying the same method to our town-halls, public libraries and museums, our national schools, we may confidently inquire whether the same spirit which moved the architects of the 16th and 17th centuries in the design of those buildings is at work, or whether the strange admixture and painful effort to produce the quaint and eccentric do not afford another instance of a perverted attempt to manufacture a fashionable style rather than to carry out from conscientious motives the principles which actuated the builders of the 16th century. One of the distinctive apartments in the houses of that period was the hall—a remnant of feudalism, but now made to play an important part in the architecture. Of reduced size and of lesser significance, it became the kernel of the plan; but we have the semblance without the reality in many of our recent buildings. Again, the fireplace with its wide arched openings and deep jambs, its settles for guests, have been reproduced with the purest, if mistaken, zeal and sentiment, in villas otherwise cramped in their appointments—a sorry conceit to hark back to a mode of living so vastly different to our own. All these things are pleasing enough, and we do not object to a moderate desire to recall the picturesque elements of the old English home; all that we ask for is that it should be done with some show of consistency and good faith, and that it shall not be done by piecemeal. Affectation in detail is one of the most obvious faults of the school of revivalists we are now considering. Bits of the Classical orders, carved brickwork, fragments of Gothic, "post-and-pan," parget, and sgraffitto work, Japanese whims, and innumerable conceits are turned to account, and we have a kind of fidgetiness that destroys all repose and simplicity. "Grouping" and "massing" are terms flippantly used, but which have come to mean almost anything now in the guise of a jumble, instead of being the pleasing variations of form, light, and shadow observed by artists of every true school—Mediævalist as well as Cinquo-centist. Of course all ideas of geometric proportions, harmonic scales, and so forth are pooh-poohed.

But the chief point we have to remark is that along with the revival of our old English architectural forms the curious and exaggerated in them, rather than the spirit of moderation and beauty, has been uppermost. The dull monotony of the period of the Regency had its redeeming character in quietness and unostentation. There were no attempts to frustrate the proprieties of correct Classical composition, no desire to force upon the eye hybrid or grotesque combinations; every feature was plainly significant—cold and academic, perhaps, but yet becomingly respectful to ordinary artistic sense. On the contrary, we have now a succession of surprises, a restless hankering after effect, the result of which is to bewilder the mind. Windows are grouped in awkward fashion, the panes of glass are placed the wrong way or made so as to uncomfortably fit the proportions of the openings, timber-framed gables are thrust into every conceivable position, and oriels are introduced in wanton profusion or in reckless disregard of aspect or situation.

With regard to minor features, mouldings and carving, the spirit of exaggeration can scarcely go farther. Coarseness and crudeness are prevailing vices with some of the younger and more ardent of artists. Under the plea of imparting energy and vigour to their works, these gentlemen plunge into vulgarity; in despising symmetry and academical precision, they become inelegant and incongruous. It would lead us farther than our present object to descant on the many vagaries conspicuous among the leaders of architectural art and the habitual contributors to competitions. We can but deplore the fact that, while accepting precedent, they cast aside the ruling motives which inspired elder artists; they endeavour to mystify and perplex, instead of refreshing us with lines and proportions that can never weary so long as the mental eye can appreciate good from bad, beautiful and pleasing forms and combinations from restlessness and caprice.

RELICS OF OLD ARCHITECTURE IN THE MIDDLE TEMPLE.

ALTHOUGH admirers of Queen Anne architecture are probably aware that the nest of chambers between Essex-street and the Temple is not without interest, they may have taken little trouble in exploring the precincts of this quarter of the Middle Temple. Additional interest may possibly be awakened in this locality from the fact that alterations are contemplated, and that one court at least is proposed to be demolished. Let us just saunter for a few moments in this quiet neighbourhood. Leading from Essex-street, a passage conducts the visitor through a pair of iron gates, the piers of which are united at the top by an arch, or scrolled brackets, of singularly good wrought ironwork, which carries a lamp in the centre. We now enter New Court, a large enclosure surrounded by sombre brick buildings. On a lower level, a descent to which is made by a flight of stone steps, is the well-known library of the Inn, in a species of bastard Gothic or Jacobean, but eminently picturesque, with its brick walls and stone-capped buttresses, and its high lantern-crowned roof, peering between the green foliage of the plane-trees which adorn this square. The view is enhanced by the garden sward of the Temple and the extended Harcourt-buildings, by Prof. E. M. Barry, R.A., the western return angle and turrets of which form a setting to the sombre-toned buildings of Garden-court. In the foreground is what was some time since a simple and pleasing jet of water, but which has lately developed into a pretentious fountain, and surrounded by beds of shrubs and flowers. Few strangers, and not many Londoners, are aware that, so close to the busy traffic of the Strand, there exists so quiet and sheltered a retreat. The architectural features of this court or inclosure, besides the library, mainly consist in some massively-treated brick fronts relieved by bands of brick, a few good cornices, and some broken door-pediments. There is, however, a charming air of *naïveté* about the place, suggestive of serenity and repose. Passing eastwards, we come to Temple-lane, a narrow thoroughfare leading out of Fleet-street. Here at the same end may be seen a few genuine examples of overhanging timber-framed fronts, filled with rough stucco, apparently of early 17th century workmanship. These fronts have the flush window-frames, projecting wood mouldings, and dentil cornices, that made up the London architecture *before* the Great Fire, and are peculiarly picturesque. Out of Temple-lane there are two passages. One of them leads into Elm-court, a snug little square of four or five houses, some of which are already threatened and closed for demolition. The houses are uniform in elevation, and have dark brick fronts with bands of moulded brickwork, and brick cut and wood cornices of considerable projection and purity of detail. On the north side is an old stackpipe-head of good design, with a lamb cast upon its front. If we pass the threshold we observe a few admirable remnants of 17th century woodwork. Entering one of the houses we notice a fine old newel staircase, with massive and effectively-turned balusters resting on a moulded string of bold design, the upper member of which is a large cavetto. The bases of the balusters are massive and square, and the handrail and capping of bold proportions and solidity, enriched with some fine mouldings. The newels are 6in. square, and the caps formed by the mitreing of the handrail mouldings round it. The stairs are dog-legged in construction, and the inner newel post is carried up quite square and plain. There is a piquancy and solidity of effect about these old specimens of joinery that captivate the eye. Many of the old doors in the lobbies and landings still remain; these have two panels with bold bolection mouldings round them, composed of a flattish bead as the prominent member, and a flat *cyma reversa* inside. In some of the interiors we find the old handrail fixed to the wall, of excellent design, cut as a deep hollow or cyma below. In one of the houses now being taken down, the ceiling has been removed, and some clever diagonal framing of the joists are exposed to view. Passing out of this court by the inner of two passages, we come to a small area called Fig-tree court, about which there is nothing very remarkable except some good brickwork and mouldings. Lamb-buildings is another and larger square beyond, the chiefly noticeable feature in which is a large brick building on one side, with a projecting door pediment, supported on carved trusses of rich and grotesque design, and having a lamb or Agnus Dei in the tympanum. The Temple Church forms the boundary on one side; Pump-court adjoins, and is entered through a portico or colonnade on the east side, over which is a tablet inscribed with the date 1681. It is a long and narrow court, surrounded by houses with begrimed brick fronts, and having broken pediments over the doorways. The lobbies and staircases exhibit woodwork of character similar to that already described above, and the sketcher of mouldings of the period would be repaid by a visit to some of the houses. We pass out of this court at the other end, and come to Brick-court, which is a widening out of Temple-lane, and enriched by several good specimens of pediments and cornices. From this court we return through Essex-court, where a few other details of a similar kind may be seen, and, finally, back again into New-court. The date of Essex-court is 1677. The courts of the Middle Temple exhibit the austere simplicity and breadth so characteristic of the Domestic buildings of the 17th century. Here we find both parapet and cornice terminations, the wide window-frames, and other striking and distinctive woodwork of the period. Massive moulded door-frames and fan-lights are met with, and some quaint bits of carving. We trust that the demolition of the condemned houses will be judiciously undertaken, and that any relic of interest may be spared. No doubt the wants of the benchers demand a considerable reconstruction of these buildings; the chambers are inadequate in size, and the lobbies inconveniently cramped; but, as a relic of old London, we hope nothing will be done to destroy more of the old buildings of the Temple than is absolutely necessary, and that at least some taste will be exercised in remodelling so unique an abode of the lawyers.

BRICKWORK.

THOUGH architects' specifications usually introduce the clause that the "bricks used are to be hard, square, sound, and well burnt," it is well known that builders avail themselves of a little latitude in the interpretation of this clause. The truth is, that the estimate of a brick should be formed upon the suitability of it for its purpose, and therefore, the only true method of judging of bricks is to know where they are to be placed in the building. The right brick in the right place, to slightly alter a common aphorism, should be the only crucial test. Every builder knows that the bricks he would use externally are not so well suited for interior plastered walls as those of rough and mis-shapen manufacture, which give a better "key" to the plaster, and which, from their being less burnt, are lighter, and more adapted for interior purposes. We may here say that only facing-bricks require to be "sound, square, and well burnt"; and for the sake of being consistent, as well as being correct, a specification ought to have such a clause as the following:—"The bricks to be adapted for the purposes for which they are intended; the facings to be of selected, square make, hard, and well burnt bricks, of uniform colour, and the other bricks to be of sound and well burnt quality." For paving, copings, and other portions of buildings subject to weight and wear, a hard variety of brick is necessary, and a requirement of this kind should be inserted in the specification of all new works. We may here refer to three varieties of bricks:—1, Ordinary bricks used for walls; 2, Cutters or rubbers, used for arches and other purposes, where the bricks require to be cut to some particular shape; and 3, Underburnt bricks, suitable only for inside walls. The requirements of ordinary bricks we have already discussed; "cutters or rubbers" should be made from a mild earth, freed from lumps of all kinds, so that it may be rubbed to a smooth face and leave fine arrises. For exposed outside work, it is better to use moulded bricks, as they are better burnt. A good rubber should be of uniform texture, and not easily cut by a knife—conditions, however, they do not always fulfil.

In "Notes on Building Construction," there are a few useful remarks made upon the method of distinguishing between, "clamp," kiln, and machine-made bricks, which we may quote for the good of our younger readers.

> "In clamp-burnt bricks the traces of the breeze mixed with the clay can generally be seen. Kiln-burnt bricks often have light and dark stripes upon their sides caused by their being arranged, while burning, with intervals between them. . . The best kiln bricks are of a uniform colour. Machine-made bricks may easily be distinguished—if wire-cut, by the marks of the wires, if moulded, by the peculiar form of the mould, letters on the surface, &c. In distinguishing good from inferior kinds of brick, one point is to notice if they are free from cracks, and lumps of lime, which, by

slaking with moisture, split the bricks." Another, but secondary point, is the shape and uniformity of size; the edges should be fine, sharp, and square. The quantity of water a brick will absorb is another excellent test of its quality. The percentage of water absorbed varies. In hard paviors the percentage is 9½, in machine-made red it is about 10, but the average absorption is about 1-6th of the weight, and in highly vitrified about 1-15th.

It would be tedious to describe the variety of different classes, our object being simply to allude to a few of the better kinds of bricks for architectural purposes. Of white bricks, the best come from Suffolk and Beaulieu. Exbury and Cowes also supply good bricks, of a pleasing white or delicate cane-colour. The London brickfields also turn out some excellent kinds. A white brick of a novel character—being made from red clay—will shortly be introduced to the London market from the neighbourhood of the Humber. We are not at liberty here to say more about the patents which cover its manufacture, for which the plant is now being laid down, but the principal point consists in the admixture of a certain quantity of magnesian limestone with the clay, which acts as a flux, and produces the desired colour. The Gault brick may be noticed as one that bears a white or slightly grey tint. It is manufactured at Burham, Aylesford, Folkestone, and other places. The Beart's brick is a well-known variety. Suffolk white bricks contain a large proportion of sand, hence their suitability for rubbers. We can also speak in commendation of the Beaulieu white brick, made from the white clay at Exbury, near Southampton, the colour of which is a pale yellow or white, combining well with stone or red brick in dressings. As regards contrast, we prefer these white bricks to those of yellowish tint which are frequently used in combination with red brick. It is a better contrast in buildings of both white and red materials to make the latter the predominant material, and use it for the wall facings, confining the white bricks to the dressings, windows, cornices, quoins, &c. By reversing the order, a very tawdry and spotty effect is the result. It is often noticed that white bricks suffer from discolouration. The green stains are the principal source of mischief, though they can be rubbed off when the wall is dry. A good wash is quoted in "Notes" from this journal, which we may reproduce for the benefit of some of our readers. It is to mix up a wash of clay and sand of which the brick was made with sulphate of copper, painting over the brick with it, and leaving it till it is perfectly dry, and then rubbing it off with a brush.

Of red bricks, those from Fareham are justly esteemed for their deep red colour and careful burning. They have been extensively used is some of the principal buildings in London, including the new Law Courts. We strongly advise their use as turned out from the kiln, and that they should not be rubbed down afterwards—a process which, by destroying the outer skin, expedites decay. With blue bricks the Fareham red produces a rich contrast, though rather sombre; but with stone or white gault bricks a very agreeable contrast is afforded. A species of dull red or brownish chocolate are also made in Hampshire and Nottingham, producing a very rich appearance. The effect of jointing, as every architect knows, is important in red brickwork. Black mortar joints produce a deep, heavy tone, needing to be set-off by the use of light-toned materials in dressings and otherwise; while white mortar has the effect of lightening by several shades the general tone of the walling. An architect should, therefore, pay some attention to the effect of this contrast, and choose his materials with a view to the ultimate expression and destination of his work. We have seen several buildings spoilt by inattention to the jointing. A deep red brick, with black joints and tile roofing, by the heaviness of the general tone produce an effect unmitigated by almost any amount of detail, hence the value, when judiciously introduced, of parget-work and timbering.

BUILDING IN THE WEST OF BRIGHTON.

From a residential point of view, the western suburbs of Brighton have become a formidable rival to the older parts of the town. The end of the Western-road is now prolonged, for a considerable distance, in that direction, and is intersected by several fine drives, or "avenues," as they are called, running from the sea northwards. Since our last notes on this locality, the open plots of freehold land have been extensively covered by rows of neat and clean-looking houses and semi-detached villas, varying in rental from £50 to £150, and even higher figures. To take a sample of these, we look into a semi-detached house in Salisbury-road, just completed. It presents a well-finished white brick exterior, with a wide entrance, and a bay-window on one side. The details, architecturally, are rather above the average; there is not that flimsy pretence to grandeur which satiates rather than exalts our notions of the suburban residence, but still much that might have been done better to show the capabilities of house-planning and design. On the ground-floor there is a wide hall and staircase fronting us as we enter: the dining-room is a large, well-proportioned room about 30ft. by 24ft., in addition to a bay window. Behind this is a morning-room, and in continuation of the hall a small library. Under the main staircase is the stairs to the kitchen apartments in the basement. The principal staircase is narrow and cramped, with steps of steeper rise than desirable or convenient. Landing on the first-floor, we enter a large drawing-room with a bay window, a side room or boudoir over the hall, and two back bedrooms with a w. c. on the landing. On the second-floor are four good bedrooms, and on upper story, partly obtained in the roof, two attics. There are two lavatories with hot and cold supply. There is also a bath-room on the first-floor. Mr. J. Athol Wood, of Cliftonville, is the architect. We find the rents of these villas range from £130 to £150, under an agreement for three years. The builders in this locality appear to indulge rather freely in a monotonous use of moulded brick, in which the changes are limited to notched and dog-toothed varieties. We see scores of window and doorway arches executed with notched voussoirs or with bricks stamped with a pattern on the face. The nail-head is a common feature in strings and label members, and the repetition of these features painfully suggest poverty of invention. In other instances a hard and meagre kind of elevation is repeated *ad libitum*, in relief of which we vainly seek a contrast. In the interior of many houses the plasterer of the flashily-genteel school seems to hold undisputed sway. Enriched cornices and composition gaselier flowers abound in all the chief apartments; the paperhanger, too, shows a decided *penchant* for patterns of a kind that appeal to the bizarre taste, both in design and colour. Compo' fronts are the rule rather than the exception, and in one of the avenues the precisionist of proportion is shocked by the outrageous size of the keystones to the windows. Arches of both pointed and segment forms are to be seen, in defiance of every recognised rule of style, and in one of the new streets we noticed stuccoed fronts of a commonplace type, relieved by a decidedly Gothicesque form of entrance hood or covering—a simple steep tiled roof supported on ornamental cut wooden brackets. Nothing could be more incongruous. In fact, the traditional style of Brighton appears to have held its own in this locality, for we see scarcely a single attempt at Gothic or Queen Anne, while the material is confined almost exclusively to stucco and white brick. One of the main drives or avenues is planted with limes, but we can hardly say whether the experiment of planting will be a success. There is certainly a lack of the shade of foliage here. Victoria Mansions, facing the "Drive," is a large, white brick block of residences to be sold or let. The front is broken up by large circular bays, and at each corner is an octagon projection or angle bay, affording pleasant views of the sea and up the avenue. One of its features is a covered balcony, carried on stone brackets to the first-floor. The covering is of zinc, with a deep richly-stamped coving at the eaves and with cast-iron pillars. The doorways are curiously arranged on the curve and have Doric ordinances. The central bay has a domical roof. This block has been erected by Mr. Ockenden, builder. A very superior class of houses has been built in one of the avenues near the church by Mr. Chappell. These are also in white brick with bay projection, the upper story being relieved by a mansard roof with dormer windows. We cannot speak in high terms of the construction of some of the new houses on the West Brighton Estate. The internal partitions are of timber, and the workmanship is not of the best kind. Aldrington Estate, a little farther westwards, offers another field to the speculative builder. The land has been laid out by Mr. E. Preston Willins, architect, of Red Lion-square, the roads or avenues being planned in a manner similar to those of West Brighton. The chief want of these building estates is a little more architectural variety. The gable, high roof and chimney, and other domestic feature of our dwellings found in the suburbs of London and elsewhere have not even obtained recognition in this part of the south coast, but we might at least have expected to find a little more invention in the treatment of the style which has found here so uncontested a field.

THE ROUND TOWERS OF NORFOLK AND SUFFOLK.

Mr. E. P. LOFTUS BROCK, F.S.A., hon. sec. British Archæological Association, read the following paper on these subjects of much controversy, at Yarmouth, on the 14th ult., during the recent Archæological Congress in East Anglia:—

I propose briefly to review the facts, as to the round towers of which you have seen this week so many examples, that have been adduced by various writers, and then to advance some further evidence. These have been so ably brought to a focus by my late lamented predecessor Mr. Edward Roberts, that I need only quote a few remarks from his paper printed in our journal, where there is a list of some 175 examples. The following facts, structurally, have been deduced. The towers are, as a general rule, about three diameters in height. Their position is at the west end of their respective churches. They have no staircases of stone. They are built so generally of the rough local materials as to justify the belief that their peculiar form was to dispense with worked freestone quoins, which every square tower requires —an advantage of very great service in a district where freestone is scarce. The walls are about 4ft. 6in. thick, and there is no western door, the approach being only from the church by the tower arch. The architectural features of what have been called the earliest indicate Norman times, and Mr. Roberts assigns the period of their erection from A.D. 1100 to 1150, and there are examples of all later dates until the fashion changed, the transition to the ordinary 15th and 16th century square towers being marked by various erections either wholly octagonal, or with the upper stage of that form and the lower portion circular.

There is, however, nothing whatever in these facts to arrive at what is of the most interest to us. How does it come that these peculiar towers are found in this district, and only elsewhere in England by such few examples as by their very existence to point to East Anglia as their home? In other districts the use of the circular form would have saved the same labour of preparing the quoins for our square towers, and while we find that this form was well known yet it was not adopted elsewhere. Mr. Roberts' list points well to the truth already referred to, that the limits of the old Saxon kingdom of East Anglia contain the vast number of the examples, Norfolk having more than Suffolk.

By comparison of the dedications of the churches, it is also apparent that while there are so many dedicated to favourite Norman saints, yet there are many called after Saxon saints, or after those popular in Saxon times. The Saxon origin of these towers is, therefore, pointed to by evidence worthy of attention. The objection has been raised that none of these towers exhibit Saxon workmanship. Were this so, the theory I have adduced would be weakened, but it would still rest upon the evidence I have brought forward. There are, however, two towers which will be visited by this association—the first, Flixton Church, Suffolk; and the second, St. Julian's Church, Norwich. Both these structures were, I believe, of Saxon date, and at both places churches are known to have existed in Saxon times. Flixton has been rebuilt in recent years, and we can, therefore, only study the sketch and the description given by Suckling. These will attest to its Saxon date. It figures in the list of Saxon churches in several architectural works, and, indeed, its style is incontestable. St. Julian's Church has also a tower too lofty for Norman work, and with deeply splayed windows in the exterior.

We are, therefore, able to show that round towers were erected in Saxon times, and that, while there are none so early elsewhere existing, the earliest known examples in East Anglia are of Saxon date. My predecessor paid special attention to the remarkable tower at Herringfleet, and, indeed, it deserves it, for it is a remarkable monument of its class. The church to which it is attached is one of the simple Early Norman buildings, frequently found in conjunction with these towers. The base of the tower is of the same date, and some of the detail of the belfry stage where the interest centres is undoubtedly of the same period. Nevertheless, there is here the triangular arch repeated again and again; the projecting pilasters and the baluster shafts, all features of recognised Saxon style. These are so pronounced—the east window especially so—that we may accept one of two hypotheses. The first that the Normans rebuilt the tower, reusing these Saxon features of an older building. The second that the tower was built in Norman times by masons accustomed to the older style, and that among the details of the time they worked the features familiar to them of an earlier period. In either case the evidence points to the prior existence of these circular towers before Norman times, and may be accepted as additional evidence to the two actual structures which I have named. The east window is so remarkable in its character and appears to be so exactly in its original position that I am sorry no opportunity has been at my disposal to examine if the base of the tower has been refaced in Norman times, leaving the old east window intact, and merely adding the outer margins of stone to the other windows, the small Norman loopholes, and other newer-looking features of the same date. Certainly from an external examination the lower face appears of different colour and masonry from the upper belfry stage. I am in a position to carry the inquiry further than my predecessors have done. There are other structural features even in the examples of later date, which indicate the origin of the fashion of these towers to others than the Normans; I adduce two. The position of the churches is generally the favourite one of the Saxons: on the edge of a slope overlooking some extent of country. The proportion is not that of the low Norman towers, but of those of Saxon times, and which were high for their breadth. In fact, the proportion of the Saxon square tower, say of Trinity Church, Colchester, seen from a little distance, would be exactly that of the circular towers under consideration. But it is probably of greater importance to point out that the origin of these towers may be found in the countries whence the Saxon races emigrated to our shores, and it is reasonable to suppose that in time, when both countries were alike Christian, that intercourse had not ceased.

It is foreign to my purpose to discuss the origin of the circular form in churches, but its use may be traced from the earliest times of Christianity. The semicircular apse first appears, then other apses and circular towers. Italy furnishes us, at Ravenna and elsewhere, with many examples. We can trace them in the churches of early date in Lombardy, Switzerland, Germany, and even to Denmark and the Orkney and Shetland Isles. These occur in all positions in relation to the buildings.

France gave little or no favour in early times to these circular towers, but in Germany and the Rhine provinces they are common. Many of the largest churches have two round towers at either its west or east end, or at the transepts. At Trèves Cathedral there are two; at Mayenne there are two; at Genrode, two; at Laach, two; at Worms, four; St. Paul's, Worms, two; while a vast number of examples, attached to important buildings, can be cited. A series showing the change of form to the latter square and octagonal towers could readily be named. These have all a proportion lofty for the width, and we find some remarkable features of detail common in the Saxon churches of our own country. Here, then, is important evidence that East Anglia is not alone in the possession of circular towers, and that these are found in the district on the opposite side of the German Ocean.

Two objections may be raised: that these examples are for the most part attached to other parts of a building, and not exactly as here, one tower at the west end. This is so in some examples I have named, but not in all, and due allowance must be made between a large church and small ones, where more than one tower would be inappropriate. The old plan of the Abbey of St. Gall, built by an Irishman, 820, has two round towers quite detached from the church.

Another objection may be that if these towers are of ancient Continental introduction, how is it that they are not found in other parts of England? I am willing to admit that the few examples in Essex, Berkshire, &c., are likely to have originated from the knowledge of the later ones in Suffolk and Norfolk, and not from any remembrance of their use in Saxon times. The influence of Lewes Priory, connected with Castle Acre, Norfolk, is sufficient to account for the examples at Lewes and its neighbourhood.

I believe that they were so used in Saxon times. There are many examples of circular Saxon towers shown in the old MSS. The staircase at the west end of Brigstock Church is of Saxon date; it is circular in form, and were it to stand alone, it would resemble a round tower very nearly. The same may be said of the similar turret of Brixworth Church. The form was retained in this locality long after Saxon times for the great advantage it possessed for the use of the rough material of the district.

Lord Dunraven has recently published the results of his father's researches in old Irish buildings, and by a process of somewhat similar reasoning, he traces the round towers of Ireland with those of the Continent, and he adduces a vast amount of information on the circular towers there, which may be consulted with much profit to this inquiry, for it applies equally, if not more so, to these round towers than to those of Ireland. It may be of interest to bear in mind that this district furnishes what may be a connecting link to these mysterious structures. At Bradfield, and at Bramfield, Suffolk, and at Little Snoring, Norfolk, the round towers, like the Irish examples, are entirely detached from the churches. So far as I know at present, none of the towers which remain possess the original covering. Probably they were similar to the conical roofs of the Irish examples, and this is the more likely, since it appears the most obvious completion, and is shown so on the examples of circular towers represented in old MSS.

BOLSOVER CHURCH AND CASTLE.

ONE of the most interesting excursions in connection with the late meeting of the British Association at Sheffield was that made by a party under the guidance of Mr. J. D. Webster and Mr. Arnison to Bolsover Castle, which is some eight miles from Chesterfield. Bolsover was reached soon after noon, and the visitors were conducted to the parish church, where the Rev. R. P. Hills read a paper. From it, it appeared that it was probable that the church was erected when Mercia became Christian in 656. Then there would have been a foundation two feet high, and upon this a building of wood and turf. About 1020 on this site the first stone church was erected, of which the sculpture of the Crucifixion, the tympanum of the priests' door, and some corbels alone remained. About 1068 the Manor of Bolsover fell under the dominion of William the Conqueror, who conferred it upon his half-brother, William Peverill. In the reign of John, about 1200, this Saxon church was demolished, and gave place to the present structure, which again in the reign of Queen Anne underwent many so-called improvements. In 1834 the church was again altered, but in 1877 the real work of restoration was commenced, through the energy of the present vicar and under the direction of Mr. J. B. Mitchell-Withers, the architect. When the north side of the nave was pulled down not only were many capitals of the Transitional Norman period found imbedded in the earth but also many of the arch stones in the present chancel arch. There existed formerly both a priory and a nunnery in the parish, but the names now only remained. There was also a chapel in the old castle, the only trace now remaining of which was two very ancient gravestones. Foremost among the marks of architectural interest in the church is a bas relief of the Adoration of the Magi. This stone was discovered in 1704, and it was undoubtedly the stone altar-piece of the Saxon church of William Peverill. The sculpture of the tympanum had been fixed at a date anterior to the Norman Conquest. As regarded monuments, there was in the chancel a tombstone bearing the date of 1310. The monument chapel and the smaller monument to the memory of Sir C. Cavendish were erected in 1617, and the curious epitaph is the work of "rare Ben Jonson." The large monument was erected in 1691, at a cost of £14,000, by the Countess of Oxford, to the memory of her grandfather, the Duke of Newcastle, and his children. Below the chapel lie the mortal remains of fourteen representatives of this noble family.

After luncheon the vicar conducted the visitors to the castle, where the Rev. R. P. Hills read another paper dealing with that interesting ruin. He believed that there were no exact details as to its foundation, but its situation would connect it alike with Roman, Saxon, and Norman times. That supposition was strengthened from the fact of there being the remains of a Roman camp in the vicinity. In 1068 Bolsover was conferred on Wm. Peverill, the Conqueror's half-brother. Before he held it, it was stated, according to the Doomsday Book, to have belonged to a Saxon Thane Leuric, but, from the fact of the castle not being mentioned therein, it could not have been built immediately after the Conquest. It was probably built during the reign of Henry I. In 1153 Peverill forfeited his possessions, and Bolsover remained for many years in the hands of the Crown. In 1189 Richard I. gave it to his brother John. In 1207 De Lisle was governor, and in 1215 it was in the possession of the rebellious barons, when the Earl of Derby took it by assault and was made governor; about 1234 the manor and castle were granted to the Earl of Chester. In 1514 (it having been for some time in the possession of the Crown) it was granted by Henry VIII. to the Earl of Norfolk, but on the attainder of his son, it again reverted to the Crown. In the 17th year of Edward VI. it was granted to Lord Talbot, afterwards Earl of Shrewsbury. This brings the history of the castle to within the last 300 years. After it became the property of the Earl of Shrewsbury the castle became greatly dilapidated. The Earl married the rich and ambitious Elizabeth of Hardwick, who quickly raised Bolsover Castle to more than its pristine grandeur. It is thought by some that the pillars of the basement story are those of the original structure. Charles I. was entertained with great magnificence at Bolsover in 1633 by the Marquis of Newcastle, at an expense of £4,000. The Royal visit was repeated the following year at a cost of £11,000. Upon the outbreak of the civil war the castle was held for the King by the Marquis. In 1644 it was captured by one of Cromwell's generals. From this date there is little to chronicle about the old castle.

Its owners ceased to reside there, and about a century ago the roof was removed from the pile of buildings now in ruins by the Countess of Oxford, by whom it was used at Welbeck Abbey. For many years the venerable pile has been tenanted by the Vicars of Bolsover. The Rev. J. H. Gray, the late vicar, had effected many restorations.

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FLEXURE OF BEAMS AND THE ISODYNAMIC CURVE.

THE subject of the flexure and resistance of beams has excited considerable attention during the last few years. Experiments have been undertaken to discover the relation of the various strains caused by flexure, and the position of the neutral axis has been the theme of anxious inquirers, who have endeavoured with the aid of polarised light and other agencies to solve the question. Mr. Bindon Stoney, whose work is an authority upon the subject, confesses the whole question is one "of great difficulty and may require numerous experiments before it can be satisfactorily solved." He deduces a general inference "that the tearing and crushing strengths of materials derived from experiments on the transverse strength of solid girders are often erroneous, and have even led astray men of such capacity as Tredgold." Mr. Hodgkinson concluded from experiments that "the neutral axis of a rectangular girder divides the depth in the proportion of 1-5th or 1-6th at the time of fracture, that is, that the compressed section is to the extended section in the inverse proportion of the compressive to the tensile strength of the material." The whole theory of the actual strength of materials and beams in particular rests upon a definite knowledge of the real position of the neutral axis; it is therefore of much interest to the engineer and architect to know the latest investigations upon the question. We now call attention to some recent experiments and the results recorded that have been published in a paper read before the American Society of Civil Engineers by Chas. E. Emery, Ph.D.

It is a very easy inference from physical laws that the neutral axis should shift its position to produce equilibrium between the compressive and tensile resistances. This is illustrated by the ordinary cross section of a cast-iron beam or the Hodgkinson section, which places the metal below chiefly, thus enabling the neutral axis to shift towards the tensile edge, and to give an enlarged section for compressive resistance. Mr. Emery attempts to show by experiments the relation of the longitudinal strains to the corresponding elongations and compressions, between the tensile and compressive limits of rupture. We propose here simply to lay before the reader the general conclusions that have been formed thereupon, rather than to enter into minute mathematical analysis. These experiments, if we may accept the author's appendices as being correct, show the probability of an equalisation of strain between the outer fibres and those nearer the neutral axis; that the latter at the section of maximum moment offer more resistance than is accorded by theory, and that the outer fibres are correspondingly relieved. Such an inference in connection with a slight shifting of the neutral axis is said to account for the greater resistance shown by beams of symmetric section than has been explained theoretically. The author notes and tabulates the elongations and corresponding strains and constructs therefrom curves in which the elongations and compressions are laid off as abscissa to the right and left of a vertical axis and the corresponding strains developed as ordinates above and below a horizontal axis. The elongations are plotted for the sake of clearness to a larger scale than that for the strains upon cross-section paper. From these curves, plotted from various experiments by Hodgkinson, David Kirkcaldy, and others, it is made apparent that cast-iron obtains its greater ultimate resistance in compression compared with that in tension "simply by increased compression with a nearly constant rate of strain instead of by an increase in the rate." It is observed that the co-efficient of resistance and elasticity is less for limited compression than for limited elongations. In general the supposition due to Navier that the stresses in a beam subject to transverse strain are proportioned to the elongations, and that the latter are proportioned to the distances of the fibres from the neutral axis is combated by Dr. Emery, who maintains experimentally that both these hypotheses are not quite true. He observes, in conclusion, that if the true relations between the strains and elongations were included in the discussion, the well-known discrepancies would disappear, and these relations he has given in a formula. As regards the second hypothesis, he says, "that when the lateral adhesion of the fibres is concidered, the position of the isodynamic (or equal) curves indicate both the possibility and probability that the intermediate fibres between the axis and outer boundaries of the beam may and do receive more strain than that due to their positions, thereby relieving the outer fibres." He further argues that this phenomenon can only account for somewhat less than "50 per cent. of the excess of resistance found by experiment," and that when the excess is greater than this it is due to the shifting of the neutral axis. We refer our mathematical readers to the equations in Dr. Emery's paper for a full discussion of the subject. Ordinary formulæ are notoriously defective, even when dealing with strains within the limit of elasticity, as they neglect chemical and molecular properties. These experimental curves may be regarded as a step towards eliminating errors and reconciling theory with experiment.

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YORKSHIRE ARCHÆOLOGICAL AND TOPOGRAPHICAL ASSOCIATION.

THE members of the Yorkshire Archæological and Topographical Association held their thirteenth annual excursion on the 28th ult., when a numerous party of ladies and gentlemen visited Aldborough, Boroughbridge, and Knaresborough. A special train, conveying the greater number of the excursionists, left Leeds for Boroughbridge between nine and ten o'clock, arriving at the latter place at half-past ten. At Boroughbridge the party was met by the Rev. Canon Owen and the Rev. R. W. Marriott, Vicar of Aldborough, and under their guidance proceeded to view the walls and buildings of the Roman Isurium and the other indications of the Roman occupation preserved within the grounds of Aldborough Manor. Just outside the station at Boroughbridge the party had pointed out to them in the distance the huge standing stones known as the "Devil's Arrows." A short and pleasant walk through Boroughbridge brought the excursionists to the grounds of Aldborough Manor, to which they had admission by the courtesy of the owner, Mr. Andrew Lawson. The Roman station of Isurium was a large and important one, sixteen miles distant from Eboracum, York. The circuit of the walls is computed to have been 2,500 yards, their breadth varying from eleven to sixteen feet in thickness, and inclosing an area of sixty acres. There is a museum in the grounds, which was thrown open to the party. The next object of interest was the ancient church of St. Andrew, at Aldborough. The tower, the nave, and the north aisle are of earlier date than the chancel, and were probably erected about 1360 by the knight whose brass is fixed on the north wall of the aisle. The chancel is evidently of late fifteenth century work. Mr. Marriott stated that the north aisle was of the Middle Pointed Decorated style of architecture; but the south aisle, having been rebuilt in 1827, was entirely modern. There were Vicars of Aldborough as far back as 1316, and, of course, there would not be a vicar without a church. From the fact that a figure of Mercury, which had been built into the east front of the church, had been found there, it was supposed by some that the site of the church had been at one time occupied by the temple of Mercury. The party paid a hurried visit to St. James's Church at Boroughbridge. This church was rebuilt in 1852, in substitution for a chapel of no architectural interest, and situated in the centre of the Market-place. Its interest to archæologists is in the fact that numerous fragments of an early Norman building, which must have had one arch at least decorated with a beaked-head moulding, and have been rich in sculpture, had been built into the wall of the vestry of the new church. From Boroughbridge the party were conveyed by special train to Knaresborough, where luncheon was provided, after which the party proceeded to view the ruins of Knaresborough Castle. Mr. G. T. Clark, F.S.A., proceeding first to the outer gateway, explained that a ditch separated the castle from the town on that side. From the entrance gate there was a drawbridge over the ditch, but there were no remains of its foundations, and it was possible that they rested on wooden trestles. He called attention to the unusual height of the gateway, and pointed out that between the portcullis and the commencement of the curve of the buttress there was a second arch from which material could be thrown down on those who attempted to break in the gate. It was clear from the fact that there was no bond between the buttresses of the gateway and the castle wall that they were built at a later date. Passing on to another part of the wall, Mr. Clark pointed out upon it a moulding which differed somewhat from the mouldings on the keep. He was of opinion that it was of later date, and it was probable, therefore, that buttresses had been added to the original wall. Coming to the keep, Mr. Clark pointed out that there had been a wall running across the Castle court, which divided it into what were called the inner and outer wards. The keep occupied the edge of the inner ward. He called special attention to the grand opening in the front of the keep. Many people whose opinions were entitled to respect held that this opening was a window. His own opinion was—and he had no hesitation in saying so—that it was a door, and that it had had its portcullis and draw-bridge. It was evident that there had been tracery over the door, and it was thought that under that tracery there was not sufficient height for a door. Certainly, if there had not been proof positive to the contrary, that tracery would have led one to regard the opening as having been a window. Taking the party next to the remains of the entrance into the inner ward, Mr. Clark said that the doorway was one of the most charming specimens of the Decorated style that anybody ever saw. It was very simple, and without any great detail of moulding. The remains of the lobby were exceedingly interesting, and indeed there was no decorated porch in the country which had a richer set of mouldings. Mr. G. T. Clark then made some remarks on castles generally. There were, he said, two types of castles. The first included the older castles, or shell keeps. They consisted of an artificial mound with a circular building on the top, such as they were familiar with at York. But although these mounds were never Norman, but pre-Conquestal and always Saxon, yet for the most part the shells built upon them were very late Norman or even Early English. Of those shell keeps the most remarkable was that at York. How was it that such castles as those at York, Tickhill, and Pickering should have been Saxon strongholds, and yet have work which was late Norman or Early English? They were driven to the conclusion that the Saxons, though employing masonry in their churches, yet for some reason or other did not employ it in their fortresses, but strengthened them with palisades. The Normans were only content with timber defences until they were able to replace them with works of stone. When William Mallett was attacked at York, and the castle was burned, the Conqueror stayed there while they were replacing it, and another was built on the other mound in twelve days. That was a convincing proof that timber was used and not masonry. In Yorkshire there was a great number of these mounds, which only needed to be taken up by the Normans to be as celebrated as those he had mentioned; but they had not been taken up, and there they remained. Then they came to the rectangular keep, of which Richmond, the noblest castle in the county, might be taken as a specimen. There was another castle whose history was not so glorious as that of Richmond, but yet was one of the grandest in England on account of its position. He meant Scarborough. There they had an isolated platform which would contain easily ten thousand men with no sort of chance of their being meddled with. The castle was cut from the land by a natural ravine of great depth. That ravine had been improved by art, and across it had been thrown a most marvellous causeway, with a sort of drawbridge, making access exceedingly difficult. Middleham was a most charming specimen of the old keep. The earthworks of Helmsley were very curious. There were other castles which did not correspond with the two types he had mentioned, such as Barnard Castle. Having briefly noticed also the castles of Coningsborough, made known to everybody by Sir Walter Scott in his "Ivanhoe," Pomfret, Bolton, Sheriff Hutton, and Spofforth, he came to Knaresborough, where, he said, they had a platform of rock on one side, and on the other two ravines nearly isolating the rock. A grand ditch cut off the castle, as at Carlisle, and on the other side there was the river Nidd. A grander site for a castle, in which wood, rock, and water combined, it was impossible to find. It was a royal castle, and those who occupied it were not owners, but merely castellans. The keep was of the Decorated period.

At the close of his address, Mr. Clark received a cordial vote of thanks. The visitors next inspected the church, the leading architectural features of which were pointed out by Mr. Fairless Barber, and this brought the day's proceedings to a close.

CONCERT ROOMS AND SOUND.

MR. CECIL J. SAUNDERS read a paper at the late session of the Musical Association "On the construction of buildings, considered with reference to sound." The author referred to the great charm in the long-continued reverberation of sound in such buildings as Westminster Abbey, a charm which is in some measure due to the association of ideas. This reverberation is, however, sadly detrimental to rapid and contrapuntal music. Glass, being one of the most elastic of sound reflectors, is very prone to produce an echo. In listening to a fugue played on the great organ at the Crystal Palace, Mr. Saunders found that the echo of one note returned to him at the same instant that he received the next one direct. Supposing a listener to stand between an instrument and a wall of glass when the scale passages for the violins in the chorus "Thanks be to God," from *Elijah*, are being played, if the wall is about 63ft. behind him and gives a perfect echo, each note in the passage will exactly meet the echo of the preceding one. The usual shape of a concert-room—a long rectangle—though it has advantages for a moderate-sized room, has serious drawbacks for a large hall. If it be very long, a large number of the audience are at so great a distance from the performer that the waves of sound, interrupted as they are by heads and bonnets, do not reach the more distant listeners with anything like their initial crispness and force. If, on the other hand, the room is very broad, there is a tendency to echo, as the sound which travels direct to the listener from the orchestra comes to him also from the side walls by a mere circuitous route, giving, if not an obvious echo, an undefinedness and want of decision throughout. A circular room has great disadvantages. The chapter-house at Westminster is an octagon with a groined roof, and the echo when the room is empty repeats itself so perfectly and quickly that it becomes a prolonged reverberation. By singing three or four notes of a concord, the whole chord resounds for a considerable time. On singing two notes forming a slightly flat major third, the whole building was filled with the beats. One of the most successful places for hearing, in the author's experience, which approaches to a circular shape, is the old Surrey Chapel in the Blackfriars-road. This has sixteen equal sides and a gallery all round. It has windows all round it, both above and below the gallery; the roof of the centre portion is hemispherical, with a small lantern at the apex. This chapel is almost free from echo, but requires a powerful voice to fill it. When a person was made to read from a book on a still day on an open plain, he could be heard 92ft. in front, 75ft. on each side, and 31ft. behind. In a hall this waste of sound is to a large extent stopped, and the walls and ceiling acting as reflectors, reinforce the sound. Light has a remarkable modifying influence upon sound, the reasons for which are not yet understood. Mr. Saunders regards a horizontal ceiling as the best, and he would have it as low as practicable, as every foot of additional height lessens the horizontal distance to which the sound can be carried. The proportions between length, breadth, and height have some influence upon the sounding qualities of a room, but here the evidence is most contradictory. Architects are baffled by finding that of two rooms of exactly the same dimensions one is successful and the other the reverse. Mr. Saunders then described a theoretical hall, capable of holding 5,000 persons, planned for the express purpose of allowing the greatest number to hear distinctly. It would be a square room with rounded corners, and the orchestra in one of the corners. The audience would face the orchestra, and would thus look towards the converging walls. The number of performers provided for would be 700, as this was probably the limit of really good work. The orchestra seats rise tier above tier into the angle of the building. The organ should be chiefly below the orchestra, so as to allow of a low ceiling. By placing the orchestra in the angle of the building, very few of the audience can receive an echoed sound. The seats for the audience should be circular, so as to give everyone a direct view. The floor should rise gradually towards the back of the room. The best material for the ceiling is wood. Ordinary plastering is one of the most perfect non-conductors of sound used in building. Zinc would be nearly as cheap, and perhaps even more efficacious than wood. The walls at the back of the orchestra should be covered with looking-glass, which has a strong reflecting power for sound. These glasses, however, should not be bedded in flannel as usual, but allowed to vibrate with every note. Boarding or cement would be best for the rest of the walls. Cement is hardly resonant, but it reflects sound well. Stone would be better, but its cost is too great. No doubt a good deal of the resonance of cathedrals is due to the surface of smooth and hard stone inside them. For quartet performances, a movable screen behind the players or singers might be arranged so as to reinforce the sound in its forward direction. This screen should be of two thicknesses of wood, with a sounding-board at the top inclined slightly upwards. Empty and half-empty rooms always echo, so that the best way of avoiding an echo is by low prices and a good programme. When there is a certainty of a small audience in a large hall, heavy curtains should be hung from the ceiling, so as to reduce its size.

In the discussion which followed the reading of the paper, Mr. William Chappell observed that in his experience a double cube, like the Store-street Concert-room, was the best. St. James's Hall was built, on his recommendation, in this ratio. As a proof that sound goes towards light, he mentioned that at first the music was not well heard at the extreme back under the gallery, but that when gas burners were put there the defect was remedied. At Her Majesty's Theatre, whenever he was in a box that was over a chandelier, he heard best. A pianoforte, to sound at its best, should be in a dark corner, with the listeners between it and the light. Mr. A. J. Ellis pointed out that the natural resonance which every room possesses for a certain sound had been overlooked. As to light we must distinguish between natural and artificial. Artificial light has been referred to, and it could not be produced without heat. Now heat produces a variety of strata in the air, in different states of heat and cold. Prof. Tyndall's experiment showed that whenever you had strata of air of different densities, you had reflection and refraction of sound, and thus you might entirely alter the mode of transmission of sound by means entirely invisible. He could not help thinking that the heated stratum of air produced by the foot-lights in an opera-house must be a difficulty to the singer. Mr. H. Heathcote Statham's theory of a concert-room was a long and rather narrow one. The side walls should be broken up so as to prevent lateral echo, and end galleries should prevent an echo from the back. He believed that the materials used imparted their own sound in vibrating; thus a large quantity of glass or iron would give a thin quality to the tone. Wood did not reflect sound sharply, but rather sympathised with it, and reinforced it, whereas all the cements reflected it in the sharpest and most disagreeable manner. He considered Mr. Chappell's experience to be due to heat rather than light. A draught of air affected sound, and at Baltimore they had applied ventilation so as to assist the progress of sound from the stage to the audience with great success.

NEW HARBOUR WORKS IN THE ISLE OF MAN.

THE breakwater at Douglas, Isle of Man, known as Battery Pier, has been finally completed and declared open. This completes the scheme for harbour improvements designed by Sir John Coode for Douglas, and which have altogether cost about £200,000. Further improvements are contemplated, in order to fully provide for daily mail communication with Liverpool. The first portion of the work completed was the structure which has been called Queen Victoria Pier. This work extends from the shore at the south end of the town of Douglas, and runs about 1,100ft. in a south-easterly direction. It is 50ft. wide at the top and has a depth of 13ft. at low water spring tides alongside the inner berths, and 20ft. at the outer, the respective depths at high water being 34ft. and 41ft.; there is landing accommodation for steamers on each side, and six sets of steps are provided. Queen Victoria Pier was completed and brought into daily use in 1872, and since that time the number of visitors to the island has been annually increasing. The outer pier, which serves also as a breakwater in affording protection against the violent seas to which the bay is exposed, commences just within the promontory known as Douglas Head, the starting-point being immediately under an old War Department battery; it has hitherto been known as the "Battery Pier." An impression seems to prevail, however, that this structure will in due course receive some other appellation.. This Battery Pier, which was last week devoted to public use, is approached on the south side of the harbour by a roadway supported by a well finished and substantial concrete revetment wall upwards of 2,000ft. long, founded on rock, and rising in some portions of its length to a height of 35ft. above low water. Seaward of the old harbour, this wall will serve also as a quay for the accommodation of vessels. The pier from Battery point is about 1,000ft. long, measuring from the face of the quay wall last described, or nearly 900ft. beyond the original low-water line. The outermost portion is of solid masonry throughout, formed of heavy concrete blocks. This part of the work is about 55ft. wide at the bottom and nearly 70ft. wide at the extreme end; the total height of the solid masonry from the sea bed to the parapet is just 80ft.; the depth at the inner berthage is 18ft. at low water, and at the outer berthage 26ft., the respective depths at high water being 39ft. and 47ft. At the northern extremity or head there is a neat and substantial concrete lighthouse tower. The focal plane of the red light exhibited in it is 52ft. above mean sea level. The works, as already observed, have been constructed entirely of Portland cement concrete blocks. They have been executed from the plans of Sir John Coode, as engineer in chief, under the direction of Mr. William Powell, as resident engineer, and without the intervention of a contractor. Their quality and finish appear to be satisfactory in all respects. The total cost has, it is stated, been but slightly above £150,000.

CHIPS.

The parish church of St. James, Iddesleigh, having been restored from the designs of Mr. Adye, architect, of Bradford-on-Avon, will be reopened upon the 17th inst.

Stoke Gabriel Church (St. Gabriel's) situated picturesquely upon the Dart, has been thoroughly restored from the designs of Messrs. Hayward and Son, of Exeter. Its reopening is fixed for the 10th inst.

Mr. Thos. W. Aldwinckle writes, in correction of a statement in our issue of last week, on p. 269, to state that the plans for the enlargement of Lambeth workhouse are being prepared, under instructions from the Board of Guardians, by himself.

The town of East Grinstead is being drained in accordance with plans prepared by Messrs. Smith and Austin, civil engineers; the estimated outlay is £6,000. In the same town a well has been in course of sinking for some months past for the new town supply; but last week, when 40 gallons of water had been obtained out of a required 200 gallons, the contractor, Mr. John Godley, suddenly threw up the undertaking.

The *City Press* states that the portrait of Mr. Sheriff Burt, painted by Mr. J. Edgar Williams, and exhibited at the Royal Academy this year, has been subscribed for by upwards of a thousand of the employés of the firm of Messrs. J. Mowlem and Co. and presented to Mrs. Burt, the presentation being made at Swanage on behalf of the subscribers by the Lord Mayor, who, with the Lady Mayoress, is the guest of Mr. Sheriff and Mrs. Burt. Mr. Sheriff Burt was at the same time presented with the portrait of Mrs. Burt, subscribed for by their sons and daughters.

A new Baptist chapel of red brick, and seating 350 people, has just been completed on the Wivelsfield-road, near Hayward's Heath station, Sussex.

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ILLUSTRATIONS.

MR. T. E. COLLCUTT'S DESIGN FOR THE NEW CITY OF LONDON SCHOOL.—THE OLD WOODEN CHURCH AT HITTERDAL, NORWAY.—NEW REREDOS IN ST. MICHAEL'S CHURCH, BOWES.—JOHNSON HOSPITAL, SPALDING.—"BUILDING NEWS" CLUB DESIGN FOR SUBURBAN VILLA.

OUR LITHOGRAPHIC ILLUSTRATIONS.

CITY OF LONDON SCHOOL.

We have already published the first premiated and selected design for these new buildings, and to-day we devote a double-page plate to the illustration of one of the most striking designs submitted. We are certainly of the opinion that it should have obtained some place in the award, even though we might hesitate in saying that it ought to have been selected for execution in preference to the one now determined upon. Anyway, our readers cannot fail to appreciate the publication of so suggestive an elevation. The motto was "Practical," and the author is Mr. Thos. E. Collcutt, architect. Another very good design under the same motto, was submitted by Mr. T. Blashill, architect, the style being Domestic Gothic, in red brick.

OLD HITTERDAL CHURCH, NORWAY.

If, in the warrior ages of the North, the Scandinavians were our superiors in the arts of war, they certainly cannot claim to have been so in the arts of peace. It is true that in the round churches of Sweden and the wooden ones of Norway they have left much that is interesting to the archæologist; but they are evidently not an artistic people, and have left nothing that is of any real value to the architect. In their treatment of wood, however, in their timber structures and their wood carvings, from the Runic downwards, the Scandinavians stand alone for distinctive characteristics. This singular-looking edifice is of very ancient date. A portion of Runic carving, representing entwined dragons fighting and biting each other, on the south door of the exterior gallery, fixes them to (that bright period in the history of our own art) the 11th or 12th century. The church is charmingly situated amidst most romantic scenery. It is built entirely of Norwegian pine, plentifully covered on the outside with tar, which has been annually renewed. In this lies the secret of its preservation, and it will probably last several generations to come. The roof and walls are overlaid with tooth-shaped shingles, those at eaves being rounded. The plan is similar to that usual in churches of the age, except that it has a gallery running all round the outside. The nave is 40ft. square; the chancel 35ft. by 25ft., and this is prolonged by a semi-circular apse 12ft. in diameter. Its extreme length and width are 84ft. and 57ft., and it is the largest of the wooden churches still existing in Norway. Three projecting doorways on the north, south, and west sides of the covered way give access to the church, and nave, chancel, and apse are each crowned with sharp fantastic-looking spires. Our illustration represents the church, not as it is, but as it used to be before the ruthless hand of the restorer robbed it of half its picturesqueness. A woodcut showing the church from the south, and a plan, are given in Fergusson's "History of Architecture," pp. 672-3.—On Feb. 9, 1877, we published in the Building News a view of the somewhat similar church at Borgund, Norway, sketched like that which appears this week by Mr. G. Canning Richardson, of Shepherd's-bush, W.; the drawing was afterwards exhibited at the Royal Academy under the title of "An Architectural Curiosity." A fine model of one of these wooden churches of Norway will be found at the Royal Architectural Museum, Tufton-street, Westminster; it is executed to scale, and gives a good idea of the construction of these curious edifices.

ST. MICHAEL AT BOWES.

This church—which owes its existence to the munificence of Mr. Alderman Sidney, of Bowes Manor, and was erected by the late Sir Gilbert Scott, R.A.,—is about to be embellished by the addition of a richly-carved reredos and wall arcade at the east end. The centre subject is the Last Supper, sculptured in white alabaster, the surroundings and canopy work over the central group in veined alabaster, and the wall arcade in Caen stone. The east window is flanked by traceried oak framing, having the Lord's Prayer, the Commandments, and the Apostles' Creed emblazoned upon panels. The tracery will be richly coloured and gilt, and the remaining portion of the east gable also coloured. The cost is about £500. The whole work is the offering of the members of Mr. Alderman Sidney's family, and is intended as a memorial to him. The architects are Mr. George Wood and Mr. E F. C. Clarke, of 5, Whitehall, S.W.

THE JOHNSON HOSPITAL, SPALDING.

About ninety sets of drawings were sent in last March for the Johnson Hospital. The one we now publish is by Messrs. Weatherley and Jones, 20, Cockspur-street, S.W., and was selected with 24 others for further consideration. This design, with the alternative plans on "Marshall's circular system," attracted much attention and was greatly approved by the medical staff. We understand the authors received valuable personal advice from Professor Marshall, of University College. A hospital on the "circular system" is being erected at Antwerp; some similar ones exist in America, but up to the present time none have been erected in England. The printed conditions restricted the outlay to £4,000; after considerable delay the tender for the accepted design amounts to £5,000. A Mr. Wheeler, C.E., of Boston, was called in to assist the trustees in making their final award; of the fifteen trustees none were medical men.

"BUILDING NEWS" DESIGNING CLUB, A COTTAGE VILLA.

As several correspondents expressed a wish that we should select a cottage villa as the subject for a design by the members of our Designing Club, we issued particulars accordingly, and in reply we received a very large number of plans, That which we publish to-day is the one which we think best meets the requirements of the conditions, as a whole, though perhaps the author has allowed himself to be carried away rather in the elevations by a desire for a picturesque and perhaps original grouping. The plan certainly is possessed of many good points, and shows much skill in the main. The author's pseudonym is "Motto J."

THE OGAM-INSCRIBED MONUMENTS OF THE GAEDHIL IN THE BRITISH ISLANDS.*

A rather bulky quarto upon a somewhat obscure branch of archæological research has been just published by Mrs. Brash, from the manuscript left by the author, the late Richard Rolt Brash, M.R.I.A., F.S.A. (Scotland), and the author of several archæological works bearing upon Irish antiquities. Mr. Brash deals with a subject with which few except the author himself can be expected to be informed. Our readers, no doubt, have heard of the many peculiar stones of Celtic character found in the British isles, and especially in Ireland; they are more or less acquainted with the mysterious and symbolic inscriptions found on sculptured crosses and pillars pertaining to sepulchral rites and legends, with stone phallic worship, but they probably know little or nothing of the Ogam-inscribed pillar-stones or monuments of the Gaedhil. The reviewer of such a work as that of Mr. Brash must be content, on ground of this sort, to accept many of the facts related in good faith, and must confine himself only to attacking any opinion founded upon them that appears uncertain or hazardous. It is rather strange that these remarkable monuments should have received such scant notice as they appear to have done. This has arisen no doubt, partly from prejudice against the study of Irish antiquities, pointed out by the author, and partly from the archaic and barbaric inscriptions or hieroglyphics found on these monuments, requiring in their interpretation a profound knowledge of the language of the Gaedhil. Mr. Brash, the author, spent many years, he tells us, in examining these mysterious monuments, and in investigating the inscriptions thereon, and has now placed the results of his labours before the public. These Ogam inscriptions have been found in England, Wales, and Scotland, and are identical with those in Ireland. Mr. Brash's work contains an account of all those known in the British Islands, besides illustrations of the more important, photo-lithographed from the author's original drawings. The Ogam stones vary in size and form, disproving an artificial formation; they are generally tall and tapering, of yellow clay slate; others are flat, cylindrical, or oval in section, with rounded ends. They are supposed to have been brought from the sea-shore, or the foot of the cliffs, where they had been rolled into shape by the Atlantic waves, and that the Gaedhil who first landed on these shores made them suitable pillars of memorial to inscribe and erect over their deceased chiefs, bards, and warriors. The characters are inscribed on one or more angles of the stones, according to its length, and consist of scores or short cuts, notches, &c., cut across a central or stem line, the vowels being expressed by dots and short notches. The sites of these memorials were originally burial-grounds, denominated keels, killeens, and kealuraghs, from the root "ceal," signifying death, concealment. The inscriptions themselves are said to be chiefly sepulchral, and the legends recorded are short and expressive. As regards their age the author does not enlighten us; but he seeks to establish the fact that the introduction of the Ogam into Ireland occurred many centuries before the advent of Christianity. The cross and other Christian emblems are thought, and not unwarrantably, from the evidence adduced, to have been added to those pillars on which they occur. On this point there will always exist some doubt. The first chapters of Mr. Brash's voluminous work discuss the early notices of the Ogam, its discovery, and manuscript evidences of its use. The Ogam character is next fully described, after which detailed descriptions follow of the Ogam monuments in the county of Cork, Kerry, Waterford, and other parts of the British Isles. It would be superfluous to enter into the researches of the author, who has at least clearly proved the pre-Christian origin of these archaic monuments, and his work is without doubt an exhaustive contribution to the subject, and is a monument of patient and loving labour.

CHIPS.

The Church of Holy Cross, Crediton, built in the 15th century upon the site of the ancient Cathedral of St. Gregory, has had the old roof and plastered ceiling in the south chancel aisle removed, and a new open one of oak, with moulded panelling and carved bosses, substituted. Mr. Dart, builder, of Crediton, has carried out the work from the designs of Messrs. Hayward and Son, architects, of Exeter.

The new reredos at All Saints', Monk Okehampton, is to be dedicated upon the 16th inst. The reredos has been designed by Mr. R. Medley Fulford, architect, of Exeter, and has been carried out by Mr. Harry Hems, of the same city.

The bells of St. Petrock's Church, Exeter, the lightest peal of six in England, have been rehung by Mr. Hooper, of Woodbury, Devon.

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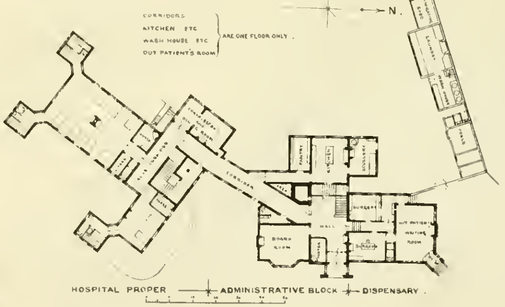
* The Ogam-Inscribed Monuments of the Gaedhil in the British Islands. By the late Richard Rolt Brash, M.R.I.A., F.S.A. Scot., &c. Edited by Geo. M. Atkinson. London: Geo. Bell and Sons, Covent-garden.

❊ Johnson · Hospital · Spalding ❊

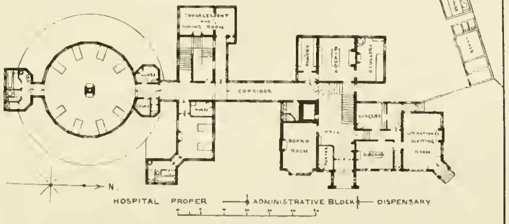
Design by Meſsrs Weatherley & Jones *Archts.*
prep^d with the personal assistance of Prof. MARSHALL

GROUND FLOOR PLAN



ALTERNATIVE PLAN ON "MARSHALL'S CIRCULAR SYSTEM".
GROUND FLOOR PLAN.

DIMENSIONS OF WARDS		PER PATIENT			
		"RUN OF WALL"	WALL SPACE	FLOOR SPACE	AIR SPACE
"OBLONG"	37·0 x 24·0	122·0	8·6	110·0	1430·0
"CIRCULAR"	38·9 DIAM^{TR}	122·0	12·2½	157·0	1779·0



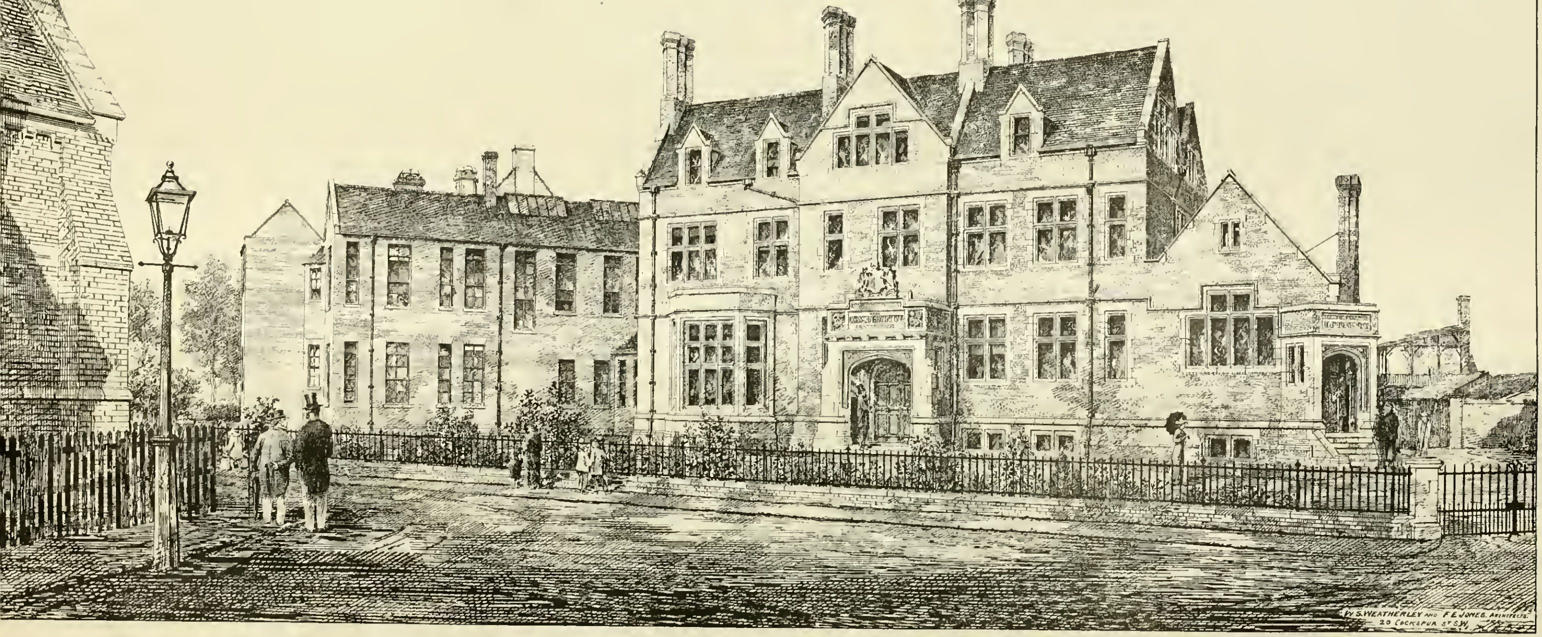
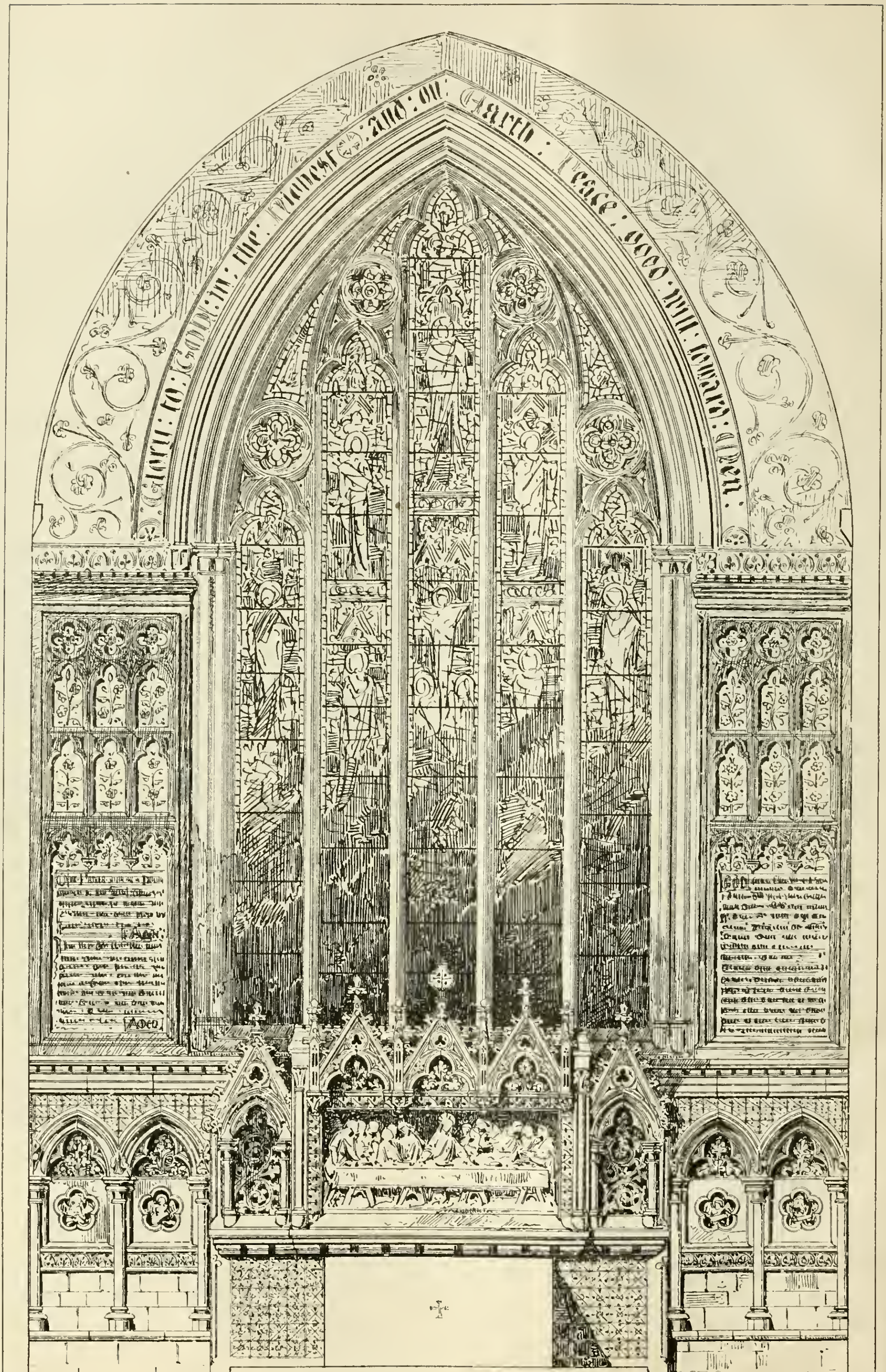

S. WEATHERLEY AND F. E. JONES, ARCHITECTS, 20 COCKSPUR ST S.W.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.


Glory: to: God: in: the: Highest: and: on: Earth: Peace: good: will: toward: men:
Amen

New: Reredos: Etca. St: Michael: at: Bowes:

George Wood.
R. F. Clarke. } Joint Archts
5. Whitehall

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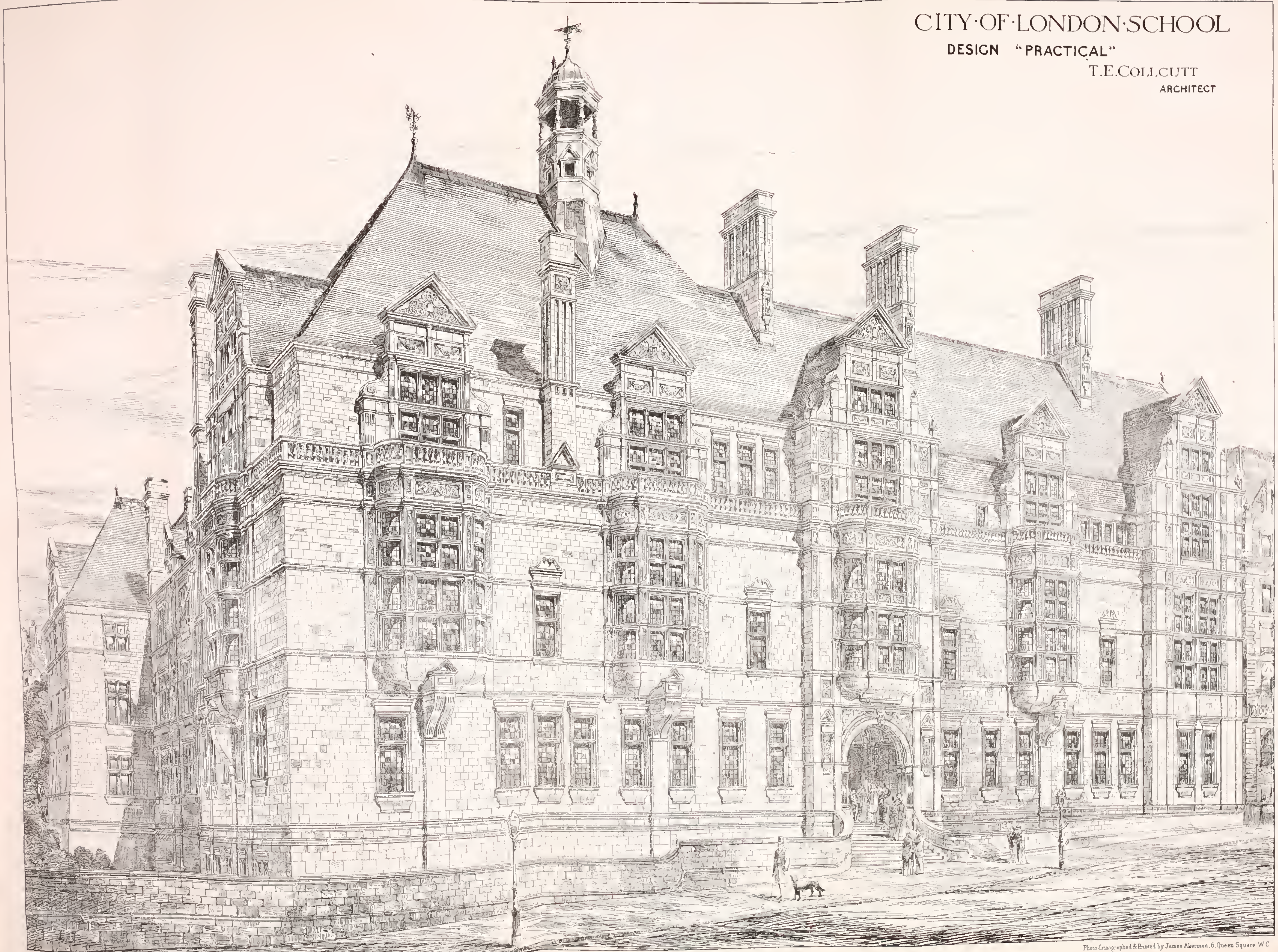

CITY·OF·LONDON·SCHOOL

DESIGN "PRACTICAL"

T. E. Collcutt
ARCHITECT

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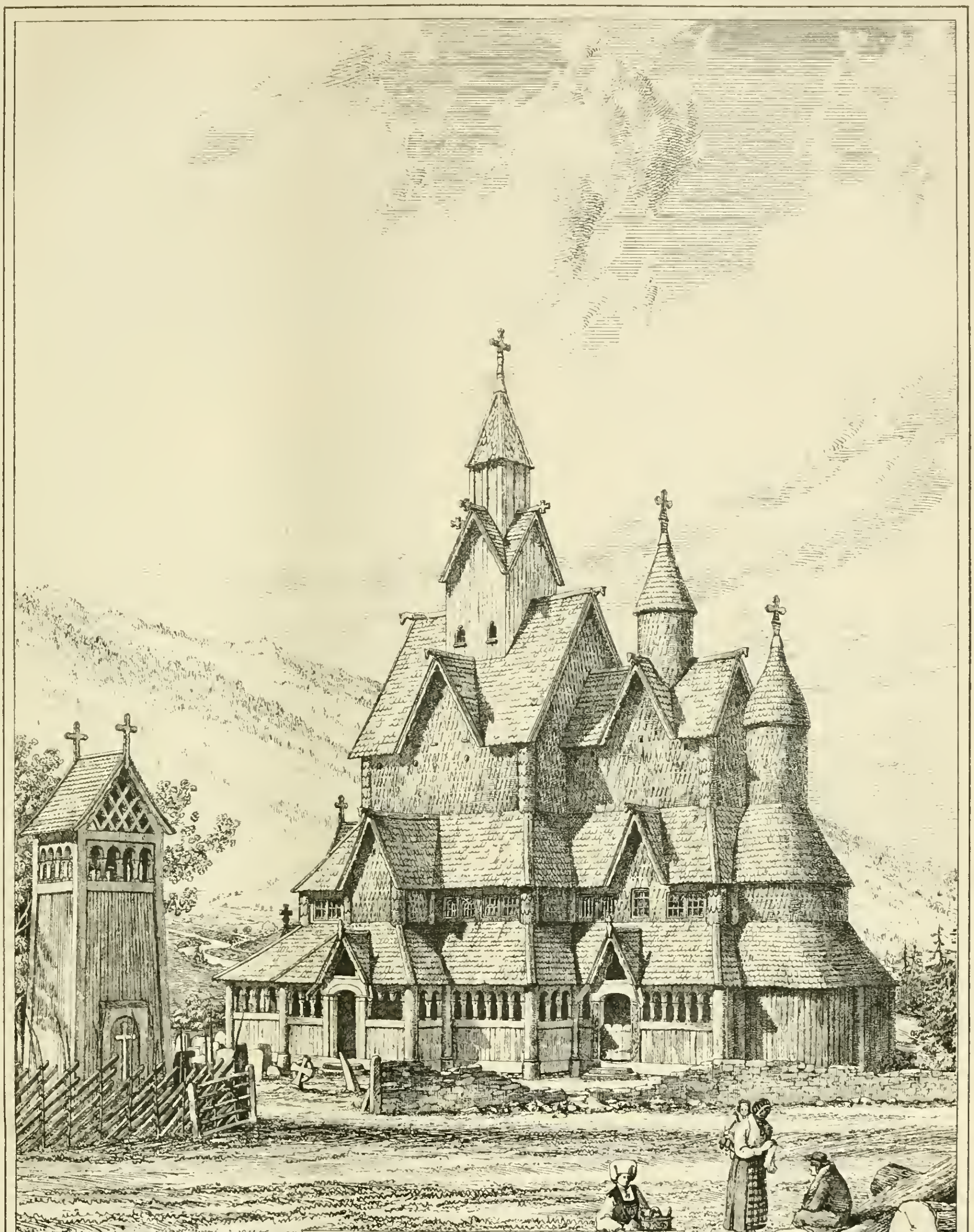
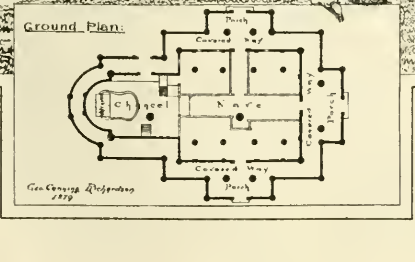
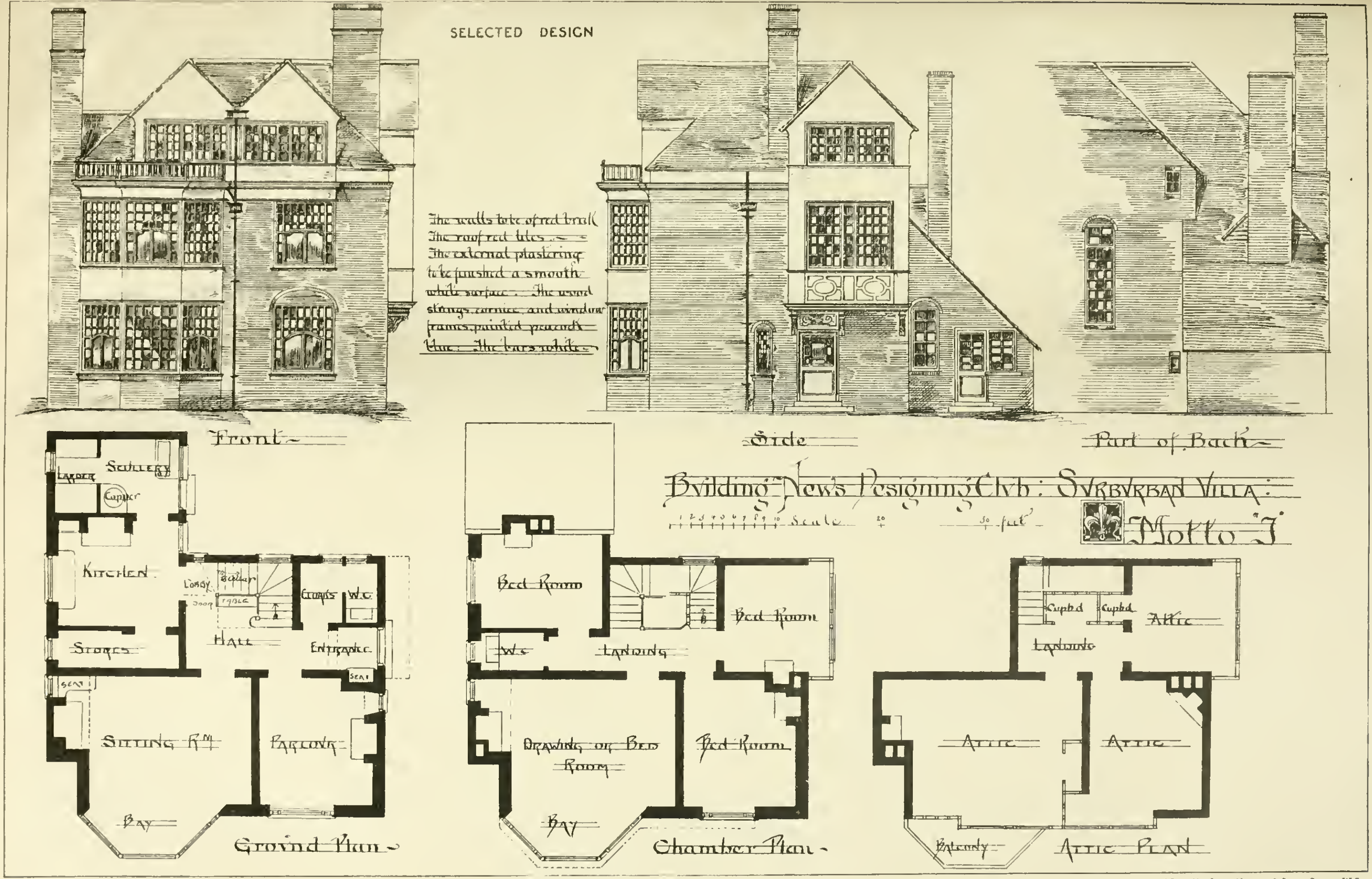




J Akerman, Photo-lith London

THE OLD WOODEN CHURCH AT HITTERDAL: NORWAY:



"BUILDING NEWS" DESIGNING CLUB

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"BUILDING NEWS" DESIGNING CLUB.

A COTTAGE VILLA.

THE subject chosen is one that has been dealt with in a variety of ways. Some of the competitors give us a large villa, others a cottage *orné*, while the accommodation proposed has not been furnished in many instances. We are rather disappointed with the result, as we consider there is not one design which fairly meets the conditions; the best we can find that combines the idea of a cottage villa with a tolerably good plan is "Motto J." The author has, however, gone in too strongly for the "picturesque," or rather quaintness, of the style selected; the front elevation is ill-balanced, though the features themselves are passable. Why should the bay and dormer gable not align? The gables would have been better tiled. The side elevation is more pleasing, because it is not strained to suit a whim. The ground-plan has a side entrance, with cloak-room and w.c. near, a good square hall and staircase, well lighted, and the kitchen and offices are conveniently close to the sitting-room and parlour, which have a front outlook. The bedroom-floor is tolerably compact, but we see no bath-room. There are three attics in the roof. Red brick and tiles, with external plastering to the bay and gables, and woodwork painted peacock blue are proposed.

"S in circle" sends a well grouped design in brick with tiled upper story, and timber-framed gable in thorough keeping; the plan is generally well arranged, with good aspect to principal rooms; a pantry and store-closet is obtained between the sitting-room and kitchen, which all open into a large hall, the entrance to latter being shut off by a small lobby under the stairs. The sitting-room is irregular in form, a large recess being made for the fireplace, and a deep bay window at one end; the main dimensions are 15ft. by 14ft. 3in. There is a small parlour in front. We do not approve the long entrance porch nor its external treatment. The offices are conveniently placed. In the upper floor there are four good bed-rooms, the largest having two bays, a bath-room and w.c. on landing, and the stairs are well lighted. The positions of the fireplaces are not the best. There is an upper story in roof with three bedrooms and a box-room. "Triangle in Circle" is the motto of a very simple and quietly-treated design, expressive of a cottage villa, but the plan is ill-digested, both as regards economy of service and construction, and the entrance is spoilt by the staircase windows close to the doorway. Why also the notched partition giving access to the bedroom? This is bad planning. "Josephus Orangeblossom" has some good points, but the plan is inconvenient in the relative positions of sitting-room and kitchen, which might have been easily obviated by a service lobby. The hall and porch are in one angle, well lighted. The bedroom plan is fairly arranged in the lobby and drawing-room entrance, but the middle passage might have been avoided by better planning. The style of the elevation is plain Renaissance, but too pretentious. We do not like the corbelled bay over the sitting-room window, and the best feature in this way is turned to the least desirable side. "Noah" still adheres to the mixed Jacobean and homely style in flint and red brick he has been wont to adopt. We prefer the back elevation: it suggests admirably the village inn or hotel, but scarcely a cottage villa. The plan is cramped, and the kitchen and offices are injudiciously placed on each side of a narrow passage. The dining-room nook is a little too quaint, and we do not admire the front door pushed up in one corner of the recessed porch. A little more study in plan might have produced something that would have gone along with the style adopted. "Under the Rose" is too villa-like in pretension, with a plan exceeding in its dimensions the requirements, though fairly grouped. The dining-room is not conveniently accessible to the kitchen, and the offices are larger than necessary. We do not see the value of the verandah in front, and the front elevation in Domestic Gothic is certainly too *en règle* and monumental. "Star" in circle; the plan is too much cut up in the offices by the straight walls. Why the long lobby with hats and cloaks and so much pantry room? The bedrooms are disposed without much regard to economy; the staircase appears to be ill-lighted for any provision we see to secure this necessary. The external design is much better, and the front elevation quietly treated. "North West" is like the two last, rather extravagant in the arrangement. The larger glazed porch and tradesmen's lobby are unnecessary adjuncts; but the kitchen and offices are well shut off from the living-room, and with a little more simplicity in the detail the elevations would have been suitable. The design has merit. "Dalgarno" has produced a somewhat abortive plan, the main fault of which is the bad proportion of the rooms and arrangement of the offices; the store and pantry would have been better in a more accessible position. The upper plan is spoilt by the long passage-way to one bedroom, and by the proportion of the bedrooms numbered 1 and 2; the landing is also ill-arranged and filled up by a uselessly small dressing-room. Elevations are in Late Gothic, certainly too ornate and expensive in the designs, but otherwise possessing merits. In like terms we must mention "Sub Silentio." The design is more suited for a villa; the back passage to kitchen is awkward and unnecessary, and the size of sitting-room too large. The elevations do not come up to the idea of a cottage villa; they are lofty, rather ungainly, and the entrance is only worthy of a labourer's cottage. "Dalgarno," No. 2.—This design is more moderate in plan, but it is expensive, and full of breaks; the means of lighting staircase and bedrooms are awkwardly contrived, and the back stairs is not required for a house of this stamp. The front elevation would be too costly in detail. Design under motto "Osian" has a *mélange* of features in the elevation, gables and pointed-roofed bays, that at once make it costly in execution; the rooms are of large size, and the arrangement is of a too formal kind. The pantry, taken out of the kitchen, the large scullery, the back stairs, and the side passage entrance, are undesirable points, the position of w.c. is also ill-considered, while the stairs is unlighted. "Curiose" has an original plan, at least. The sitting-room is made octagonal, and is placed at one end with a square-gabled end above it, but we do not see any advantage from the arrangement, while that the hall and study are made very awkward in shape. The elevations are in brick and timbering. The cost is put at £750. "Ya-de-Vola" is the motto of a plan at least sensible in the general distribution, but wanting in the details necessary to insure convenience and comfort. The kitchen and scullery are in the right position, but the accessibility of the former to the dining-room might have been rendered easier. The front elevation is rationally treated in the main features, but the porch is poor and meagre. "Purswell" has the germ of a good plan, but the hall is spoilt by the lavatory, and the upstairs landing is wasteful. The elevations are of timber-framing in the upper story, and with a little more study the design would have passed muster. Estimate at 6d. a foot comes out at £698 19s. "Elève" is expensive; the hall divided into a porch and bay recess, and the large sitting-room and kitchen would serve better for an inn than a private house. The offices are not well planned, and we cannot see the use of the outer porch to scullery. The landing on the upper floor is undesirable. Of the elevations we cannot speak in commendation. They are a curious mixture of brick, timber, and tiles, and an odd bay, with open rafters on one front. "Ich Dien" is queerly arranged in the hall and serving passage; the kitchen is placed in front; in other respects the plan is compact and square. The elevations are in a plain brick style, with windows irregularly divided in front; it has also an unpleasingly heavy roof, and a meagre-looking doorway. The estimate is £1,065. "Con Amore" is a cleverly-arranged plan, square in outline and economical; there is a side entrance and hall well lighted, and the living-room is long, with a recess at the inner end obtained by china and store cupboards. The main defect is the position of scullery doorway relatively to the hall. The bedroom floors are also compactly planned, and the elevations simply and effectively treated, the staircase windows being made a feature in the side elevation. The alternative plan is not so good. "Che Sara Sara" has the elements of a fair plan; one serious defect is that the scullery leads direct out of the hall. The elevations are rendered ridiculous by the cross-bar work of upper bay, the long brackets under windows, and the side porch; and the author might well devote his attention to details. The cubing at 4d. is too low. "Boz" has not an unredeemable plan; it is at least compact and squarely arranged, one of the least satisfactory points being the disconnection of kitchen and scullery, necessitating the cooking utensils being carried across the hall. The front elevation, roofed with two gables, and the small windows are objectionable features, while £475 is too low, showing that the cubing must be wrong. "Boiseau," "Spider," "Nitor," "Hornet," "Juvenis," "Peter," "Ogmore," "Melnotte,' "Naïveté," "To be or Not to be," "Veritas Vincit," "Meute Manique," are more or less suitable in plan, but have missed the mark from some defect of arrangement or in elevation, which it would be tedious to particularise. Very general faults are the omission to light the staircase if it is internal, wastefulness in the hall, and an awkward distribution and proportion of the rooms.

A CABINET CHIFFONIER.

The best sketch contributed is by "Motto J." The front has three divisions—a lower cupboard, a shelf, with sliding glass panels above, and an upper cupboard. The framing to the cupboard doors is ornamental, with curved angle bars, forming octagon panels for bevelled glass. The angles of the chiffonier have pilasters carved in panels with foliage, and the whole is proposed to be in blackened English oak. "Noah" comes next in merit. His design in the Adams' style is a raised cupboard with shelf, upon which is a glass case or cabinet, having glazed sides as well as front for *bric-a-brac*. A scrolled pediment broken in centre with pedestal crowns the top; the wood is satinwood inlaid, and having medallion figure subjects in lower panels. The detail is refined. "East Anglian" sends a design in oak in a plain Jacobean style, with lower cupboard, and upper shelves for china, with mirror panels, white metal hinges and fastenings, and stamped leather in lower panels. The detail of the upper portion and the turned balusters to the front are quiet and in good keeping, and the drawing is neatly executed. Design marked "Burswell" has a plain cupboard below and open shelf for china above with drawers. The lower framing is spoilt by the ornament in the spandrels of arches, and the stop chamfering is rather out of keeping with the general design. "Belteshazzar" has not certainly informed himself of the recent taste in furniture; his fanciful carved side supports and cresting may be considered "pretty and elegant" by those who purchase from the fashionable bazaars; but we hope we do not offend him by saying that such work is now considered tawdry finery. Just let him consider for a moment whether wood cut in this manner against the grain is really a suitable or legitimate mode of decoration? Would it not break all to pieces in removal? The carved scrolls formed upon ornamental piano cases have surely taught a lesson. "Ogmore" obtains his ornament in a less reprehensible fashion, but the design would have been much better without the painted panels representing a pine-apple and a vase of flowers. Walnut veneering and ebony mouldings are suggested with oxidised silver hinges and fastenings to the cupboard and glazed upper doors. "Steffano's" design would have been tolerable if the entire upper part had been omitted. We recommend him to study some good examples of furniture.

STREET CARRIAGEWAY PAVEMENTS.

TWO papers under this title with the discussion thereon have been published by permission of the Council of the Institution of Civil Engineers, and edited by Mr. James Forrest, the secretary. The first paper is by Mr. George F. Deacon, M.I.C.E., the borough engineer of Liverpool. We need hardly say that Mr. Deacon has had a considerable experience in this branch of his profession, and his opinions are entitled to careful attention. The author gives chiefly his experience of the carriageways in Liverpool, and we find many useful and suggestive hints at some of which we may glance. Referring to the hard dressed stone or "set" pavements, Mr. Deacon says that the widths of the "sets should be such that four taken at random, and placed side by side, will not measure more than 14in. across," which gives an average surface width of less than 3in. As this necessitates a number of longitudinal joints, and prevents the easy breaking of joint, the square form has been abandoned for an oblong figure of 3in. by 5 to 7in., which is found not to be too great in relation to depth to insure stability. The depth of stone is from 6½in. for moderate, to 7½in. for heavy traffic. As regards jointing, the author appears to favour asphaltic materials for this purpose, and observes that a crucial examination of many classes of pavements satisfied him that those jointed with asphalte retained their figures better, and wore out less rapidly than others. In the southern counties a grouting of hydraulic lime and gravel is brushed into the joints, but the objection the author urges to this method is, that the stones work loose and the grouting soon becomes disintegrated. In the towns of Lancashire and Yorkshire the sets are jointed by filling in between with clean gravel and then pouring in a boiling asphalte of pitch and creosote oil. In adopting this plan the sets should be dry, set upon a concrete foundation with a ¾in. layer of sharp sand, and overlaid with clean gravel which has passed through a ¾in. riddle, which should be brushed into the joints and the sets rammed, so as to insure the interstices being well filled. The asphalte is prepared in boilers on wheels, and about 50 gallons of creosote oil are required to every ton of pitch. After the asphalte has been poured over, the pavement is finished by covering it with small sharp gravel. As regards the cost, the total for materials and labour per square yard is stated to be 11s. 4d.

Great stress is laid npon the necessity of the homogeneity and strength of concrete foundations, and the concrete used at Liverpool by the author is fully described. This is formed in layers of broken stone, with strata of cement mortar between, so that each layer of stone is coated with mortar, and a maximum of strength is attained. The cement used is specified to be of the tensile strength of at least 800lb. on a section of 2¼ square inches, and eight days, the author says, should elapse before the concrete thus prepared is paved upon. Alluding to the contour or cross section of pavements for traffic, a profile approximating to a hyperbola is suggested as better adapted to diminish traction and wear and tear than the segment of circle, the rise in centre being the half-width of road divided by 36. Comparing the different classes of pavements, the author distinguishes (*a*) the tonnage passing over the carriage-way in 12 months, (*b*) its width, and (*c*) the number of wheels on which the 12-months traffic is borne. Then $\frac{a}{b}$ = the weight of traffic per yard of width, and $\frac{a}{c}$ = the number of tons per wheel, giving a fair knowledge of relative conditions. We cannot enter into other data, hints, and statistics given by the author, which will be found of value to borough surveyors generally. A table, showing the costs of various pavements, entering into the items of stone, cost of foundation, sinking fund, maintenance per yard, and total annual cost per square yard, is of special value, from which we gather that the pavements constructed in Liverpool for heavy traffic cost annually nearly 1s. per square yard.

Mr. Osbert Henry Howarth deals with an allied topic in a paper on "Wood as a Paving Material under Heavy Traffic." He discusses the advantages and disadvantages of the several kinds of pavement, and we are glad to find admits the advantage of wood as being more elastic than other materials, while insuring a reasonable degree of durability. The quality of absolute permeability also is questioned as a desirable one in a town roadway. We cannot here enter into the arguments brought forward, and which point to a pavement "that shall fulfil the needs of tractive power independently of designed mechanical form tending to obstruct free draught of load." The author observes, "a surface retaining the least possible quantity of extraneous matter is the desideratum; and only on this being attained can the true capacity of wood on end for affording a frictional foothold be duly appreciated. When this is increased by a dressing of clean, sharp grit or large sand, which at once becomes permanently inlaid into the fibre, it may be made amply sufficient to insure the safety of all traffic under ordinary circumstances, even under the existing crude system upon which horses are shod." The author refers to blocks taken up recently from the centre of Oxford-street, which have been subjected to three and a half years to traffic of nearly 300 tons per foot per day. These blocks show still the surfaces inlaid with the grit, and their vertical wear is said to be inappreciable, 1-16 to ⅛ of an inch being the utmost amount of wear observed in them. The great difficulty with wood-paving is undoubtedly to insure uniform quality in the wood fibre, and the author says if this could be obtained a wear of at least 25 years per inch depth of wood might be confidently expected from good ordinary deals. Of course, a pavement has to withstand the vertical impact of weight, resistance to which can only be afforded by a good foundation of concrete. Henson's wood pavement is pointed to as fulfilling many of the conditions required, the chief of these being that of providing a continuity of surface, and an artificial foothold. The blocks, as our readers are aware, are placed on tarred felt, with strips of like material between each course, thus forming a close and slightly elastic joint. Mr. Howarth says the "standard of comparison, therefore, to which street pavements are to be referred must embody the two elements, viz., the work performed, and the sum total of direct expenditure upon it, during a recognised unit of time." Taking first, a street with traffic of from 200 to 400 tons per foot per day, the foundation if of sound well mixed Portland cement concrete; 6in. thick, may be considered permanent. We have next, only the expense of pavement over shorter periods. Thus a wood pavement, costing at the outset 10s. per square yard, and the same for renewal every seventh year, with 1s. per yard, per annum, to cover all maintenance, would show a fixed cost of 2s. 5d. per square yard per annum. The papers of Mr. Deacon and Mr. Howarth, together with the paper we gave last week, will be read with interest by all surveyors, and we hope the hints and experiences they contain will lead to a more satisfactory mode of estimating road maintenance, and placing statistics on a more systematic basis. Merely to compare traffics is an unreliable test in the absence of other data of comparison.

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THE MOSQUE AT CORDOVA.*

ALTHOUGH most of their earlier monuments have been altered or destroyed, one magnificent example is still left in the great Mosque of Cordova, which was built between the years 786 and 796 A.D., a century and a half after the Hegira. Of the Moors who invaded Spain in the beginning of the eighth century, and of the buildings then existing, little is known, though it is certain there were many remains of Roman work scattered over the land, which so materially influenced the invaders, that they substituted for the pointed arch, universal in the East, the Roman arch, raising the centre, however, and giving it the horseshoe form. In fact, the true Hispano-Arab work is so influenced by classic traditions, that it is rather a form of Byzantine than of Arabian art. It was not until the growing power of the Kings of Castile and Leon forced the Moors, in the latter part of the eleventh century, to call in their co-religionists from Morocco, that the Arab influence gained the ascendant; this fresh infusion of African blood showed itself at once in a new style, whose tropical wealth of ornament reached, in the fourteenth century, a full development in the Alhambra Palace at Granada.

Emerging from one of the winding, narrow streets of Cordova, which, as in all Moorish towns, was purposely so built to shut out the fierce southern sun, one comes suddenly upon the great wall surrounding the court of the mosque. This is built, like most walls of that period, of tapia, a mixture of earth, sand, lime, and stone. By the main entrance, under a wide horseshoe arch, rises a tower, which probably resembled the Giralda tower at Seville, but which was clumsily recased at the end of the sixteenth century. Entering a spacious court with arcades on three sides, the view is charming; dense orange trees cast cool shadows in the brilliant sunlight; beyond the wall, with Eastern battlements, rises the dome of the cathedral, which, in the sixteenth century, was barbarously built in the middle of the mosque. Leaving asido for the time this Renaissance excrescence, enter the great central door. The effect is wondrous. On all sides a forest of columns stretches away into the sombre twilight. The mystery of woodland glades is amongst these countless arcades. Shafts of many marbles—jasper, porphyry, and verd-antique—line the darkening vistas; only down the nearest aisle, in the far distance, a pale light falls upon a screen of white interlacing arches. Superposed open arches above the aisle arcades increase the bewildering mystery of the many aisles. Of the twelve hundred monolithic columns which were formerly here (several hundred have disappeared in modern alterations), some were sent from Constantinople, and the remainder were taken from Roman buildings in Africa, Spain, and the south of France. They are arranged in 19 aisles, intersected by 33 transverse smaller ones. The eight eastern aisles were added at the end of the 10th century, and though thus two centuries later than the 11 others, there is hardly an appreciable difference in style or work. The arches have keystones of brick alternating with stone, and this is one of the earliest examples of that alternation of coloured courses which became in all countries a sure sign of Eastern influence. The double stories of arcades were probably a device to obtain the height which employment of the small Roman columns did not sufficiently give. There was without doubt originally a rich wooden ceiling, such as may still be seen in Cairo, which was afterwards replaced by the brick vaults now in place. Mr. Fergusson is at some pains to explain the original mode of lighting the mosque, and supposes that the upper part of the outer walls was an open arcade; but to one fresh from Cairo, it seems more simple and natural to believe it lighted from above by lanterns of lattice-work, which may still be seen in Egypt in connection with just such wooden ceilings as must formerly have roofed this building. This is the more probable, inasmuch as the light is at present admitted by wells left in the vaulting in the very places which would formerly have had especial need of light.

The simplicity which gives a peculiar grandeur to the main part of the mosque is heightened by the splendid decoration which is concentrated about the Mihrab, or sanctuary towards Mecca. The deep glow of the magnificent mosaics catches the eye from the most distant aisles, and fixes the interest on the sacred niche. This and the two chapels flanking it are inclosed by arcades whose elaborate intersecting and superposed arches are unique. That in front of the Mihrab consists of three cusped arches, whose sides are carried across the central keystones up to the sides of upper arches, supported upon a small order above the large columns. This produces a heavy complication, which would be more curious than beautiful were not the arches relieved by very rich alternate keystones, which gives the desired lightness of effect. The three chapels have each beautiful cupolas resting upon octagons formed by wide arches opening across the corners, and intersecting so as to give alternate penetrations for semicircular windows. These light the superb mosaics with which the vault and wall are covered, and which rival anything to be found at Ravenna or St. Mark's. The Mihrab itself is inclosed in a square frame of golden Kufic inscription on a blue ground; while the horseshoe arch has deep keystones with green Byzantine scroll patterns on a background of red and gold. Within this arch is an exquisite little octagonal niche, with a mural cusped arcade, and covered by one huge stone carved into a ribbed shell. The equally beautiful vaults of the chapels on each side of the Mihrab are whitewashed, but one still retains fine mosaics upon its walls, while similar ones are very likely hidden behind a Renaissance altar which now occupies the other. Excepting the Kufic inscription all the details of these mosaics are Byzantine, and workmen are recorded to have been sent from Constantinople to make them, the connection between the great Eastern capital and Spain being close in those days.

As if expressly to show how the Moors nationalised these Byzantine details, there stands near the Mihrab, among the pillars of the aisles, a curious chapel, whose ornamentation forms a connecting link between this mosque at Cordova and the perfectly developed style of the Alhambra Palace. It is a square room raised about 3ft. from the floor of the mosque, and is pierced to the north and south with a rich arcade. The ingenious vault is carried upon bold light arches, which adjust an octogona upon the square. It is upon the walls that are first seen the profuse and complicated patterns in stucco which become the leading *motif* in the Alhambra decoration. These designs are as yet coarse, and lack the delicate refinement subsequently attained. Here, also, is seen the dado of coloured tiles, henceforth a characteristic of Moorish work. This Villa-Viciosa chapel has given rise to discussion as to its use and date, but it is probably of the twelfth century, and was erected as a screen for the sovereign's devotions.

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* From the *American Architect and Building News.*

So annoying is it to have the vistas through the aisles of the mosque blocked up by the sixteenth century choir which was built in its centre, that little beyond careless abuse is given to this modern pile; but, in spite of its impertinent intrusion, it deserves attention as a most elegant piece of Plateresque architecture—which is the Spanish term (silversmith's work) for their development of the François I. and Cinquecento style—an architecture which received such refined execution at the hands of the clever Spaniards of the sixteenth century, that it deserves a special notice. Passing out, then, from the twilight aisles of the mosque into the sunny court, fragrant with orange-trees, and enlivened by the picturesque groups always gathered about the fountain, the violent contrast produces one of those powerful sensations which constantly electrify the artist in Spain.

NOXIOUS VAPOURS AND SMOKE.

FOR rather more than two years the factory districts have been tantalised with reports of a new machine, by which the air was to be kept clear of poisons, the smoke of the tall chimneys washed white, and the chimneys themselves done away with. An explanation of the apparatus by which these wonders may be accomplished is given in the *Times* by a correspondent from Manchester, and it is now believed that a few more weeks will enable a fully qualified authority to report upon the projected method of smoke cleansing, with such ample proof of its powers and of its products as may set every reasonable doubt at rest in the mind of the public, and induce the Government itself to take some action in the matter.

The leading feature of the new process is the washing of the furnace-smoke while on its way to the chimney. The work is all done in a chamber which is a kind of enlargement of the flue. The lower part of the chamber is a tank of liquid, the surface of which is just touched by a series of paddle-wheels, each of which has a screen of coke or other material rising in advance of it. The swift rotation of the wheels keeps up a constant spray of the liquid, which washes the smoke as it passes down and through the screens, so that all impurities are deposited in the tank. The objection most likely to be raised against the apparatus is that it may diminish the draught, but it is found by experience that the draught can, on the contrary, be increased to any desired extent by the action of a fan which forms part of the apparatus. Besides the hope that the products formed in the tank, when filled with an alkaline solution, may be valuable enough to repay the manufacturer for cleansing his smoke in this way, there is the further encouragement to be drawn from the smallness of the chimney required for works in which the process is adopted. The height required for draught is diminished, and as regards the mere conditions of smoke-discharge, it is evident that no greater height is necessary for that, when the smoke itself is purified, than the height of ordinary dwellings. In many places the chimney could practically be dispensed with. All new works could be constructed without the usual "stalk" that so much disfigures the landscape, and thus an important item of expense would be saved. Where the tall chimneys already exist, the cleansing apparatus will reduce them at least to a superfluity.

The apparatus has been for some years in operation at two of the largest lead-smelting works, and it was in connection with Mr. Beaumont's lead works in Northumberland that the process was first devised. Mr. Johnson, the manager, was the author of it, but he employed it in the first instance from motives of economy, in order that the products obtainable from the fumes might not be wasted. The application to the smoke of manufactories in general has been the work of the patentees at Manchester, Messrs. Johnson and Hobbs. They obtained a certificate of merit from the Manchester Sanitary Association when the apparatus was publicly exhibited in August, 1877. Since then it has been exemplified on a much larger scale at the engineering works of Mr. B. Goodfellow, at Hyde. The cost of applying the system must vary with the size and character of the works in connection with which it is employed. Inquirers after the machine have, therefore, been requested to specify the number of furnaces, boilers, fires, &c.; the amount (approximately) of coal used per annum; the dimensions of the flue between the furnace and the chimney; the nature of the gases to be absorbed, and various other particulars on which the estimate of cost would depend.

The reader may be assisted to understand the process by a more detailed description of the apparatus at Mr. Goodfellow's, with which the chief experiments have hitherto been carried out. In this instance the machine is working with two Lancashire boilers, 30ft. long, and of 7ft. diameter. It is, however, quite large enough to wash the smoke from four boilers of the same kind and dimensions, burning when in full work about 18 tons of coal per week per boiler. The chimney is 3ft. in diameter, and only about 30ft. high, this being found quite sufficient to take off all the steam, &c., that escapes. The success of the washing process has sometimes been put to the boldest possible test by an adventurous inquirer breathing over the mouth of the chimney with impunity. There was nothing worse to endure than an escape of carbonic acid gas, and a temperature much reduced by the washing process. An equally convincing proof, however, is afforded by dipping a white handkerchief into the smoke as it leaves the furnace, and another white handkerchief in the same smoke as it issues from the chimney. The handkerchief held there is not discoloured at all, while the one dipped into the smoke before the cleansing becomes filthy in an instant. The centre of interest in the apparatus is the chamber through which the smoke is passed between the furnace and the chimney. It is in this "enlargement of the flue" that the cleansing is entirely performed. In the present case the chamber is about 35ft. long, 5ft. wide, and about 6ft. high. The upper part of the chamber is of wood, but the tank forming the lower part of the chamber is of brick, set in cement, and having a coating of cement about ½in. thick. The bottom and sides of the tank are set and coated alike, so that all is watertight. The bottom of the tank is not level, but sloping, the depth at the back being about 6in., and at the front 1ft. At the lowest point is an outlet-pipe, by which the tank can be emptied at any time. But the tank is about 2ft. wider than the upper part of the apparatus, and the sloping bottom allows sediment to be easily drawn to the front and removed without having to empty any liquid, and therefore without having to stop the machinery. The object of what remains to be described is to wash all impurities out of the smoke and deposit them in the tank. As the smoke passes through the chamber on its way from the furnace to the chimney, it is cleansed by the spray of finely-divided water, or other liquid from the tank, thrown up by the rapid rotation of three paddle-wheels, with projections or teeth on the blades. The action of the wheels and liquid on the smoke is aided by a series of screens, of which more will be said presently. The wheels are 2ft. 6in. in diameter and 4ft. long. They have eight blades, the projections or teeth of which are about 6in. apart, and so placed that the teeth of one blade are opposite the spaces between the teeth on the blade before it. The wheels run at about 300 revolutions per minute. When the tank below is filled, if the wheels are at rest, the tips of their teeth barely touch the liquid. The first wheel is at the entrance of the chamber, where the smoke comes in from the furnace. About 1ft. in front of the wheel is the first screen, composed of wood lattice-work. The part of the screen next the wheel slopes up, from about the water-line to the top of the chamber, at an angle of about 45°. The screen is the whole width of the chamber, and at the base it is about 4ft. 3in. thick. The upper part is only 2ft. thick. A side section of the screen is, in fact, a triangle, having its base at the water-line of the tank, for the front next the chimney has not a parallel slope, but a vertical descent. The back of the screen, which is next the wheel, is boarded down for about 2ft. to prevent the smoke from being drawn through the upper and thinner part. The second wheel is about 6ft. from the first, and comes immediately beneath the vertical front of the first screen. It is the same in all respects as the first wheel, and has a similar screen in front of it. The third wheel is about 6ft. from the second, and is like the other two, with a corresponding screen in front. The cubical contents of each screen will be about 60ft., and all the space is carefully filled with lattice-work. As the wheels all revolve towards the screens, they throw the spray completely over the whole of them, and, in fact, fill the chamber with a dense rain. About 8ft. in advance of the foremost (the third) screen there is a fan, 3ft. 7in. in diameter, and 3ft. wide, with six blades, and running at about 500 revolutions per minute. Thus sufficient draught for working purposes is created. The smoke is subjected to all these revolutions and screenings on its way through the "rain" to the chimney, and is found thoroughly cleansed and washed before it escapes. Whatever was taken from it is imprisoned in the tank, and enters into the solution or deposit. The numerous chemical experiments that have been made during the last 12 months establish the fact that from 70 to 80 per cent. of the sulphurous acid given off is removed from the smoke when water alone is used in the tank; but by using an alkaline solution the whole is removed. It is found that the draught, instead of being impeded, is decidedly improved by the process, and that a much better combustion of coal is therefore obtained. In fact, the draught is better with the low chimney described than used to be obtained with a chimney of 7ft. mean diameter, and 75ft. high. The height of the water in the tank is regulated by means of a ball-tap, so that as the quantity of water decreases, either from evaporation or any other cause, the tap is opened and the tank filled to its proper level. The average temperature of the gases leaving the boilers is from 500° to 700° F.; but after passing through the chamber the temperature of the smoke is reduced to about 90° F. This machine requires about 2½ nominal horse-power to drive it, and is estimated to cost about £250 complete. The cost of machines for other works would be more or less, according to various conditions before referred to.

A GRAMMAR OF JAPANESE ORNAMENT.*

THE second instalment of Mr. T. W. Cutler' work sustains the character of which we have already said it gave promise. In the present part there are some choice and very suggestive examples of ornament—birds and foliage making up a large portion of the lithographic illustrations, and the author appears to have selected those which are characteristic of the Japanese style, and which illustrate the structural principles of that species of ornamentation. As we have already urged Japanese ornament to be useful to the artist of this country, ought to be applied purely in a decorative manner, and without a slavish adherence to mere examples. The designers of our woodwork, fabrics, china, glass, embroidery, &c., require rather to be taught the *method* and aims of this unique art than its vagaries, and Mr. Cutler, by placing before the student a few select and typical specimens culled from lacquer-work, china, and textile fabrics, will help him more than any mere collection of china or bewildering examples. A directing principle underlies, for instance, the examples on plates 8, 41, 42, 56, 55, and the elements of the forms are given in separate examples, as illustrated in plates 52. We rather prefer the prints in the greys and browns. The chrysanthemum or aster pattern, plate 56, and the folial suggestions on plate 41, are extremely beautiful instances of the spirit and aim of the Japanese artist. We find many excellent ideas suitable for the designer of paper and embroidery, as, for instance, the four rich patterns—gold on a black ground—furnished on plate 57, all admirably adapted for surface decoration in these fabrics. Plates 8 and 17 are chromos. A little easier reference to the examples might have been given by letters or figures. The spray, and bird on the wing in the first plate, and the treatment of fish and grass in the second, are both suggestive to the painter on china, glass, and other materials. We are glad to find that the author intends to accompany the examples with descriptive notes, as these will add much to their value and instructiveness, as we pointed out in our first notice. An essay on the principles of design is to be furnished also. The overwhelming mass of Japanesque rubbish and imitations now in the market, while evincing the growing popularity for the freshness and originality of Japanese art, is also a source of danger with which the true artist must be deeply impressed, and every effort to sift the pure grain from the chaff must be welcomed by all artists. On this ground alone Mr. Cutler's "Grammar" deserves our commendations.

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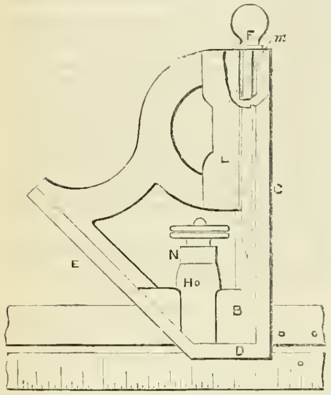
* A Grammar of Japanese Ornament. By T. W. Cutler. London: B. T. Batsford.

IMPROVED TRY SQUARES.

AN improved try square for the use of draughtsmen, joiners, and others in line drawing, or in laying out lines at right angles, or at angles of 45°, has, according to the *English Mechanic*, just been patented in this country on behalf of Mr. L. S. Starrett, of Massachusetts. In the figure, which is a side elevation, will be seen a graduated steel rule or bar, having extended through it lengthwise on one side of it a long groove, rectangular in its transverse section. This bar enters and slides in a recess formed in the foot or lower part of a stock, B, one edge, C, of which is at a right angle to its lower edge, D, while the other, E, is at an angle of 45° with such lower edge. Within a socket opening into the recess, and made in a boss arranged in the stock, as represented, there is a clamp hook formed to engage with the groove in the steel bar; it is provided with a nut, N, secured on the shank of the clamp, is counterbored, and has within it a helical spring to bear on the top of the base, and to serve when the nut is loosed to draw the clamp upward so as not only to prevent the bar from falling out of place in the stock, but dirt or extraneous matters from working between the bar, and the top of the recess in which such bar is placed. A pin, H, inserted in the base and projected into a hole in the shank of the clamp, prevents the clamp from revolving in the base. The foot of the clamp extends into the recess and takes into the groove in the steel bar. Furthermore, there is within the stock and parallel to its edge, C, a spirit level, L, which is protected by an arch extending lengthwise over it as shown. The stock is also provided with a socket to receive a stylus or scratch pin, F, which by a friction spring, M, is prevented from accidentally dropping out of the socket. The rule or bar besides having at its opposite edges divisions or lines indicating inches and equal parts thereof, has made through it several holes half an inch or other suitable distances apart from each other, from centre to centre, such being of proper diameter to allow the point of the awl or scratch pin to be extended into and through them far enough to make gauge marks when it may be desirable to use the instrument for laying out work, such as mortises, or tenons. One or more holes near the end of the bar may be countersunk to admit of the point of a lead pencil being introduced through either, and used instead of the scratch pin for making gauge marks. The working edges C, E, of the stock are placed far enough apart for the bottom upper edge of the bar recess to be long enough to afford a suitable bearing for the bar, and also to admit of the boss being made between them, whereby the clamp is not only covered and protected on all sides, and shielded from dust or extraneous matters, but is prevented from accidentally slipping sideways out of the groove in the bar. The instrument made as shown will be readily comprehended by persons skilled in the use of similar instruments.



COMPETITIONS.

Newark New Hospital.—The following architects have sent in designs and reports, in competition for the new hospital at Newark: Messrs. Hine and Sons, Nottingham; Mr. Saunders, Nottingham; Mr. Goddard, Lincoln; Messrs. Martin and Hardy, Nottingham; Mr. George Sheppard, borough surveyor, Newark. Twelve architects were invited to compete, of whom, it will be seen, only five have accepted the challenge. The stipulated cost is £3,300, and this the governors have stated will not be exceeded. A committee has been appointed to examine the several plans, and report back to a special meeting of the Governors, to be held on Tuesday week, the 16th inst. The plans are to remain in the town-hall for a week, for inspection. A correspondent states that the contest will be between Mr. Hine and Mr. Sheppard.

Over Darwen Town-hall and Market-house Competition.—At the Town Council meeting held on Monday afternoon, Mr. Waterhouse's award was read and confirmed, as follows:—1st. premium for town-hall to Mr. Charles Bell, of 4, Union-court, Old Broad-street, London, E.C., being motto "1879"; the premium for market-house was also awarded to the same competitor. The second premium for town-hall, to motto "Crogins," Messrs. Ed. Salomons and R. Seldon Wornum, 39, Old Bond-street, London, W. The third premium to motto "As you like it," Mr. R. K. Freeman, Wood-street, Bolton, Lancashire.

York: St. Lawrence Church.—A limited competition has just been decided at York, in which the following architects took part:—Mr. J. G. Hall, Canterbury; Messrs. Perkins and Sons, Leeds; Mr. W. G. Penty, York; Messrs. Gould and Fisher, York; Mr. Fowler, Durham; and Mr. Demaine, York. The "anxious deliberation" of the committee ended in the selection of Mr. Hall's design. The award seems to have given anything but satisfaction to the other competitors, because the committee arrived at their decision without the aid of a professional adviser. This they promised to do in their conditions sent in the first place to the competitors, viz., that either Mr. Street, R.A., or some other eminent architect, would be called in. The stipulated amount was £6,000, and the committee consulted Mr. Hall before they selected his plan as to whether his design could be carried out for that sum. It was, perhaps, natural that Mr. Hall's reply affirmed that it could. A tower and spire were included in the designs of Messrs. Perkins, Gould, and Fisher, and also in Mr. Hall's design; while Messrs. Fowler, Penty, and Demaine omitted such a feature with a view of meeting the stipulated cost. As the church is to seat 800 worshippers, and bearing in mind the costly nature of stone at York, we should not be surprised to hear that the contract sums for the execution of the selected design very greatly exceed the present estimate. If so, justice has not been done certainly to those competitors who prepared more moderate designs; while all reckoned upon the committee being properly advised in making their award, after the promise given at the outset.

CHIPS.

A new Baptist chapel has been built at Hatherleigh. Mr. J. B. Horne, of that place, was the architect. It is of Gothic character, built of local Cleave stone, and has a gabled roof facing the main street. The windows are glazed with cathedral tinted glass. The interior fittings are of pitch-pine, and the walls stuccoed. The building is 60ft. by 28ft., and 40ft. high, and accommodation is afforded for 500 people. Messrs. Petherick Bros., of Hatherleigh, have been the builders.

The parish church of St. Margaret, Stoodleigh, some six miles from Tiverton, is now being restored, from the designs of Mr. Henry Woodyer, architect, of Guildford. Mr. Redfern is his clerk of works in charge.

The company formed for carrying on the sewage-irrigation farm belonging to the borough of Warwick have been compelled by serious losses voluntarily to wind up affairs.

Building Intelligence.

Chulmleigh.—The parish church of St. Mary Magdalene, Chulmleigh, was reopened, after restoration, last Wednesday week. The works embrace the complete reseating of the nave and aisles in oak; the erection of stalls in the same material in the chancel; the putting up of a memorial pulpit, the addition of a new credence, and the general restoration of the tower. The seating throughout has been made by Mr. Grant from the designs of Mr. J. F. Gould, architect, of Barnstaple; and the carving upon them is by Mr. Harry Hems, of Exeter, who also executed the pulpit, which has been designed by Mr. R. Medley Fulford, architect, of Exeter. The works to the tower embrace the erection of new battlements and crocketed pinnacles in Dartmoor granite, and other necessary additions and renovations. This portion is not yet complete, but is being carried out from the designs and under the supervision of Mr. Edward Ashworthy, of Exeter.

Edinburgh.—A new Roman Catholic school is about to be built in Edinburgh to accommodate about 300 pupils. The building will be of two stories, each consisting of a general schoolroom, 63 feet long by 28 feet 6 inches wide, with two class-rooms. The lower story is intended for infants. Externally, the building will present a frontage showing at each end a high peaked gable carried out to the line of the foot pavement, the intermediate part being recessed to the extent of three feet. The windows are mullioned, those on the lower story having transoms, and the centre and end windows on the upper story pointed arches over them. The plans have been prepared by Mr. R. Moorham, and the estimated cost is over £3,000.

Manchester.—The premises in Albert-square of the Household Stores Association, Limited, where the business has been hitherto carried on have been found too contracted. About 18 months ago the directors intrusted to Messrs. Mangnall and Littlewood, architects, of Manchester, the designing and carrying out suitable erections for the special purposes required upon an eligible plot in King-street West. The space of ground covered by the buildings is about 1,300 square yards in all, 300 yards of which, at the end furthest from Deansgate, are devoted to the purposes of a hotel. The style of architecture adopted in the entire erection is Italian, and the principal frontage is five stories in height, the lower portion being of Yorkshire stone, and the upper story of brickwork is intermixed with stone dressings. The heating apparatus is on the principle of distribution of hot water in small wrought-iron pipes, and Mr. Renton Gibb, of Liverpool, has executed this work. Messrs. Neill and Sons are the general contractors for the buildings and for the fittings and fixtures. Mr. Edward Wood has acted as clerk of works.

Merchant Taylors' Hall, City.—A large block of buildings is in course of erection on the north side of Cornhill, consisting of spacious suites of offices and chambers, with shops on the ground floor. The banqueting hall and premises of the Merchant Taylors' Company immediately adjoin these structures, and are now being largely extended by the erection of additional buildings lying between Threadneedle-street and Cornhill, and connected with the hall by a corridor. The new buildings consist of two wings at right angles to each other, and are Gothic in style, profusely decorated with carving. They contain three floors besides the basement, the upper floor having dormers in a high-pitched roof, hereafter to be covered with pea-green slates. The several floors are lighted by traceried windows, whilst in the centre of each block is a bay window, 12ft. high, and 8ft. wide, divided by carved mullions. The facing materials are Portland and York stone, with diaper string-courses, between each floor. The principal room is in the block placed north and south, and is 40ft. by 25ft., and will be decorated "regardless of cost." In the other block are on the ground-floor an assembly room and library, a luncheon room, and offices. The first-floor of both blocks is planned as apartments for the convenience of guests of the company, as dressing, bed, and linen rooms; the second floors are similarly arranged, and in the basements are the servants' apartments and waiters' dining-room. The cost is estimated as exceeding £20,000, and the new rooms will not be ready for use till two two years hence. Mr. I'Anson, of Lawrence Pountney-hill, is the architect, and Mr. George Shaw, of Westminster, the builder.

Queen Victoria Street, City.—With the completion of the new Post-Office Savings Bank buildings now in progress for the Government in Queen Victoria-street, that new thoroughfare will have been entirely built up from the Mansion House to its junction with New Bridge-street. The new Savings Bank buildings are now almost completed externally, the fifth—the top story—having been reached. They have a frontage to Queen Victoria-street of 146ft., and are over 80ft. high, being the loftiest buildings in the street. The elevation is entirely in Portland stone, the ground and first-floors being rusticated. Each floor shows a range of eleven lofty windows, those above the ground-floor being finished alternately with triangular and arched pediments. The cornice is 5ft. deep, and projects nearly 4ft. beyond the general face of the work; it is to be surmounted by a 3ft. parapet. The windows of the basement are deeply recessed. There are entrances to the building at the east and west ends. Internally, the floors are all to be fireproof, and will rest on iron girders and columns, the total weight of iron in the building being estimated at about 900 tons. The building extends to an average depth of 100ft., and covers a ground area of nearly 15,000ft. super. The general business of the Savings Bank will be conducted on the ground floor, while the upper portion of the building will be devoted to clerks' offices of the department.

Sulhampstead. — The church of St. Mary, Sulhampstead Abbots, after being closed for about a year for purposes of restoration, was reopened on Thursday week. The church consists of a nave with small north aisle and chancel, and has a western tower quaintly supported upon timber-work, standing within the walls of the nave. The tower and chancel are not placed centrally with the nave; and in other respects the church possesses features of antiquarian interest. The which have just been completed consist of the restoration of the nave, tower, and south aisle; the chancel, having been repaired about twenty years ago, has not been included in the present restoration. The timber roof of the nave has been opened out and the old timbers exposed; the floors have been paved with black and red Staffordshire tiles; the old pews have been removed and seats (made in English oak to correspond exactly with some old seats belonging to the 15th Century, which were found in the church) substituted; and a modern porch at the south entrance has been removed, and a new open porch of oak, corresponding in character with the old work, has been built in place of it. The old gallery at the west end has been swept away, and a new oak pulpit and prayer desk take the place of the old ones. The works have been executed by Messrs. Wheeler, of Reading, from the designs and under the superintendence of Messrs. Morris and Stallwood, architects, of Reading. The cost of the repairs is about £900.

CHIPS.

The Lancaster Gas Company are about to erect a memorial lamp and fountain in the Market-square, Lancaster, as a memorial to the late Dr. De Vitre, for many years their chairman. An inclosure 15ft. square will be made in the centre of the square, with a dwarf column at each angle. In the middle will be a pedestal and die of stone, and above the latter will be four drinking fountains, with lions' head outlets. Above this will rise a Corinthian shaft, with floriated base and capital, supporting a large central and four smaller lamps. The total height from ground to top of lamp will be 22ft. The column will be of cast-iron, bronzed, and the estimated cost will be about £200.

The funeral of John Riggs, for many years estate carpenter on the Suffolk estate of the Earl of Stradbroke, took place on Sunday, at Wangford, and was attended by the Countess of Stradbroke, Lord Dunwich, the Ladies Rous, and all the members of the establishment at Henham Hall, and many residents in the neighbourhood, as a mark of the respect in which the deceased was held.

The borough engineer of Liverpool, Mr. Deacon, has reported to the town council on the relative advantages of electricity and gas for the illumination of the new Picton reading room. The report is in favour of the electric light, as giving greater brilliancy at a less cost.

More than Fifty Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation render its the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.C.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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Front Page Advertisements and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

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Cases for binding the half-yearly volumes, 2s. each.

Received.—B. S. and H.—W. R.—W. H. L.—T. E.—Mc.N. R. and Co.—B. and J.—C. G. and Co.—F. B.—J. H.—J. R. M.—J. L. W.—H. L. B.—C. F.—S. S. and H.

T. H. D. (The number is out of print; the illustrations of Arundel new church were given in the Building News for Feb. 13th, 1874.)—C. S. (1. See back vols. 2. See price books. 3. Apply at Stanford's, Charing-cross. 4. Our own opinion has been expressed, and we see no necessity for evoking that of others; the difference is in the arrangement.)—Enquirer. (Practically the difference would be very small indeed.)

"BUILDING NEWS" DESIGNING CLUB.

We shall publish our award of the prizes next week, when the names of the authors will be given. To prevent disappointment and mistakes, we shall be glad if competitors will furnish us with their mottoes, accompanied by their names and addresses, before Wednesday next.—A. L. B. (The suggestion you make has been considered.)

Drawings Received.—H. Ward, Watkins and Son, T. C., B. and C., A. B.

Correspondence.

HULL LUNATIC ASYLUM COMPETITION.

To the Editor of the Building News.

Sir,—Your critic takes objection to those designs having their principal front facing the west, on account of the fall of the ground from north to south, losing sight of the fact (in his otherwise able and interesting report) that the gradient of the land from west to east is much sharper, and, therefore, that those competitors whose designs have the long axis of their buildings upoo this line, have greater difficulties to contend with as to levels.

I inclose for your inspection site-plan from actual survey, in proof of my statement.

With your usual impartiality, I trust you will insert this in your next issue, and oblige

One who has Carefully Studied
1st September. the Levels.

Sir,—In your able criticism of the plans sent in for the above competition, you have inadvertently made some inaccurate statements, which, if not corrected, will seriously lessen our chance of success. We trust that you will allow us to reply, as shortly as possible, to such statements, which we have numbered 1 to 8:—

1. We have merged our main corridors into what should be the private "corridors of the blocks, and that in places the visitors or officials would have to pass through the throng of the patients." *Reply*—Our corridor commences at the end of No. 1 block on one side, and passes completely round the asylum to the end of No. 1 block on the other side. Owing to the fall in the ground, we are able to pass under the administrative block without in any way interfering with any room or passage occupied by patients or open to visitors.

2. "In more than one case the continuity of the corridors is broken, by serving as waiting-rooms, by day-rooms, dormitories, and by, what the author terms, 'gallery dormitories.'" *Reply*—The continuity of the corridors is not in any case broken by any room or dormitory whatever. On page 3, line 20, of our report, you will find our reasons for having no separate corridor through No. 1 block.

3. The central feature in the south front is a semicircular bay, and the windows are in great measure blind. *Reply*—It is hardly fair to call this small bay of 10ft. the central feature of a 700ft. frontage. We think this term would more fairly apply to the whole of the dining-room block. There is not a single blind window in the whole asylum.

4. "The epileptic patients are unprovided with day-rooms." *Reply*—The day-room provided for the acute cases is always considered, and used in small asylums as the epileptic day-room, and is situated in our plan immediately under the epileptic dormitory.

5. "The staircases are placed at random." *Reply*—The staircases are placed in the fire-proof corridors at each end of every block.

6. The water towers over the staircases are not placed to serve the purpose of ventilation. *Reply*—If you refer to p. 2, line 19, of our report, you will see that the hot water-cisterns are placed in these towers, which *are* used as ventilating shafts.

7. "The accommodation is stated at 400, but as the beds are not shown this cannot be easily confirmed." *Reply*—The total accommodation, including the housekeeper's department, is 410 beds (see p. 5 of our report), and every bed except the 10 in the housekeeper's department, and the single rooms, is shown on the enlarged drawings of the various blocks.

8. "The cost is given at £38,000 for the building proper, and with the adjuncts, £56,000." *Reply*—The entire cost of the building, exclusive of fittings (*i.e.*, furniture) is £46,500. See report, p. 8.

We send you herewith a copy of our report, with photographs of three of our plans, in order that you may test the accuracy of our statements. —We are, &c. No. 14 (Lucidus Ordo).
September 2.

Sir,—Our attention has been called to your first report of the designs in this competition in your issue of Saturday week, in which it is mentioned that "Steer's hot-water grates" are proposed for warming. This is a mistake; they are hot-air grates that were recommended. Exception is taken to the amount of the estimate, which was calculated at 6d. per cube foot; but, if estimated at 4½d., as many of the others seem to have been, by that and subsequent reports, it would reduce it £60,000. From the authors' experience, and the cost of asylums recently erected, 6d. is the least that they can be done at.

As no recreation-hall was required by the instructions, it was only suggested that one might be placed in the situation of the block which, it appears, was erroneously supposed might be turned into one.—We are, &c.,
York, September 3. Utilitas.

THE ETHICS OF ADVERTISING.

Sir,—Why should not an architect advertise? I wish some of your elder readers would answer this question. I am a young architect with a small amount of idle capital, part of which I should be glad to invest in your columns in making known my existence and what I fancy are my qualifications for increased employment. Indirectly I do advertise, and get a fair return for my outlay. I have designed furniture, &c., for a large maker, who knows the value of the publicity afforded by the advertisement columns of the professional journals, and of course I get the benefit of his announcements. Why should I not, without violating professional etiquette, be allowed to advertise sketches of buildings I have erected, with testimonials from their owners as to my fitness and capacity? I see, in the only American professional journal which has any claim to recognition as such, that Trans-atlantic architects do this, apparently without losing caste. Why should not we?

I think it was Sir Walter Scott who begged Lord Byron not to be too hard on a bear who, lacking more substantial means of satisfying his hunger, was blamed for sucking his own paws; so it seems to me young and unknown professional men are snubbed for desiring openly and honestly to make known their existence when, by publishing illustrations of works and other methods which I need not refer to here, they may do so indirectly without violating the letter of a rule of business which seems to me an unreal one.—I am, &c.,

A Door-Plate near the Strand.

THE CHURCH OF WELLS-NEXT-THE-SEA, NORFOLK.

Sir,—This church, a fine and rich, though not a large, specimen of those re-erected throughout Norfolk in the 15th century, was destroyed in a few hours on the 3rd ult. The tower was struck by lightning during a storm, and a line of fire is said to have run along the body of the building to the vestry roof, which was set alight. It is proposed to restore the building as far as possible to its original condition.

I have been informed that several students and others recently sketched in and about the church, but, thus far, I have been unable to ascertain their names. Should this letter be seen by any of those who have sketched the roofs, rood-screen, or any other part of the building, they will greatly oblige by communicating with—Yours, &c.,

Herbert J. Green.

50, Prince of Wales's-road, Norwich.

FREE ART EXHIBITION IN LAMBETH.

Sir,—On Sunday last I had the pleasure of relieving Mr. Rossiter, the active principal of the South London Working Men's College, of the duty with which he has generously charged himself during the vacation as caretaker of the South London Free Art Exhibition. During the evening the rooms of the college, in which the exhibition is placed, were crowded, and it is to be hoped that those who have aided in this undertaking will be rewarded by seeing it eventually grow into a permanent museum and art gallery for the south of London.

Those of your readers who recognise the great usefulness of such a work as this in the centre of so dense a population as that in Lambeth, particularly when it is made available on Sundays, will, I am sure, be glad of an opportunity to assist the principal of the college, who has had the public spirit to organise an exhibition which must have cost much time and labour. The very success of the exhibition has considerably increased the anticipated expenditure, and subscriptions will be thankfully received by Mr. Rossiter, at the College, 143, Upper Kennington-lane, S.E.—I am, &c.,

Hastings, September 3rd. Mark H. Judge.

CHIPS.

Last week Pellon-lane Baptist Chapel, Halifax, was reopened. The chapel and schools were almost gutted by fire in February last, but restoration has been made after the designs of Mr. W. H. D. Horsfall, of Northgate, Halifax. The chapel will accommodate 650 people. The cost of the restoration is £3,500.

A new Roman Catholic Church was opened at Burton-on-Trent last week. The church has been built from the designs of Mr. Morley, architect, Burton-on-Trent, by Messrs. Lowe and Sons, builders, of Burton, and is Early English in style. It consists of nave, aisles, chancel, with a small chapel at the end of each aisle. It is built to accommodate about 400 persons, and the cost has been £3,500, exclusive of altar.

A meeting of the Doncaster Workhouse Committee was held on Tuesday week. After a careful examination of the plans of the proposed alterations and additions in the workhouse, they were approved, and ordered to be submitted to the board. From an approximate estimate given by Mr. Masters, of the firm of Wilson and Masters, architects, Sheffield, the architect, it appeared that the plans would involve a cost of upwards of £5,000, viz.—for additional accommodation at the entrance, extended accommodation for tramps and separate cells, &c., £2,051; additions to the main building, £850; forty additional beds in the infirmary, £1,074; and new hospital for infectious and contageous diseases, £1,200.

The Ilkeston local board decided last week to carry out the enlargement of the gas-works, at a cost of £7,500, in accordance with the recommendations of the Local Government Board inspector.

The foundation-stone of a Baptist Sunday-school building was laid at Clay Cross, near Chesterfield, on Wednesday week. There will be a lecture-hall, 50ft. by 36ft., seating 400, fitted with pitch-pine seats and wainscotting, and ventilated by Howard's patent Archimedean screw; an infant class-room, 21ft. by 12ft., and five other class-rooms, each 10ft. square. Mr. W. Bramham, of Clay Cross, is the architect, and Mr. H. E. Tinkler, of the same place, the contractor. The cost will be about £700.

Intercommunication.

QUESTIONS.

[5881.]—**Animal Carvings on House at Cordes.**—I shall feel obliged if any fellow-reader can give an explanation or the history of a singular house at Cordes, near Albi, in the south of France. The lower story on the chief front of this house is blocked up, but on the first and second stories are ranges, each four in number, of what in this country we should regard as Early Decorated two-light windows, with traceried heads. Sprinkled above and around the upper tier, and set irregularly in the walls, are curiously-carved stones, representing dogs, hares, falcons, owls, and men on horseback. Murray does not refer to this house (of which I have seen no other example of similar kind) in his "Handbook to France," which is rather scanty in information as to Languedoc, but makes a feature of the fortifications, which are but commonplace. Has the house been illustrated, for I know of no other example of a similar kind? The town of Cordes itself, I may add, is an out-of-the-way little place in the Department Tarn, placed on the very cap of a steep conical hill, and only accessible by a four-mile omnibus drive from the railway station at Vindrac. It is a most interesting town, full of mediæval houses in its Haute Ville, which is still inclosed by its ancient walls and gates, around which are suburbs on the slopes of the hill. The house I refer to is in the main street of the old town.—Pierre Crayon.

[5882.]—**Surveyor's Charges.**—Will any reader inform me who ought to pay the surveyor's charges in a case where a house has been damaged by building operations adjoining; a surveyor has been called in to make a survey of the damaged premises, and he charges the occupant for his services?—A.

[5883.]—**Dilapidations, &c.**—I should be glad if some reader would kindly reply to some queries on the above subject, which appeared in the Building News of July 4. I more particularly want to know what steps are to be taken when a three months' notice to repair has expired, and nothing has been done by the lessee.—L. T. W.

[5884.]—**Rules for Tendering.**—Will some of your readers kindly inform me if it is the custom of architects to invite fresh tenders for a building after the first tenders have been delivered, and the amount of such tenders made known to the competitors, simply on account of a modification in the elevation and a reduction in the amount of provisions? In the case I refer to quantities were supplied (to the parties specially invited) and a large amount put down for provisions, but the estimates much exceeding the amount proposed to be spent, an alteration of the front elevation only was made, and nearly all the provisions struck out. My estimate being the lowest (in an invited competition) I consider I was entitled to expect an interview with the surveyor, with my priced bills of quantities, and with him to make such reductions as the alterations warranted. Instead of this, however, fresh invitations were issued to the competitors after having made known the amount of first estimates. My own experience has always previously been that in invited or limited competition, should any reductions be deemed advisable, the builder sending in the lowest tender has been asked to go through the quantities with architect and surveyor and arrange with them the amount of such reductions. I shall be glad to have the opinion of the trade on this point.—Spero.

REPLIES.

[5787.]—**Strains on Collar Beam Roofs.**—I am not aware I have failed in my previous argument. I have simply answered the questions put to me by "H. A." and supported the assertions of others, and still maintain that a collar beam should be in compression or not used at all, but put in a tie-rod in place of collar. Of course, I am speaking of the constructive requirements, not of the artistic, and it has not been proved to the contrary, unless "H. A." is to be the sole arbitrator. The contrary opinion is proved if the number of the correspondents in the matter goes for anything. I will answer his inquiries without figures.—Lateral pressure to overturn wall: Take the height and the width and call them a lever, the fulcrum being the point of intersection of base and perpendicular, the proportions of one to the other will be the power, half the weight of the wall will be the resistance. Add to this the adhesive strength of the mortar, which varies as much as anything you could imagine, and you will get your answer. Thrusts may be mechanically incorrect, but they are practically correct and proved by actual tests by me. The roof failure I gave him was not designed by a "first-rate foreman of joiners," but an architect of some note, who did not know anything about construction, a very common thing nowadays, as they are brought from the school and put into office to copy drawings, then become architects before they know what a brick is made of. I could mention several chief engineers on railway and other works, and many under or district engineers who have been brought out of the workshop. One of the best pieces of iron construction in London was designed by one of them. There are four in one family, all masons by trade, who write C.E. after their names, and where put forward by an eminent Government engineer of the same trade. I have had some of the most impracticable drawings from architects, but not from engineers. The principle of the roof is not obsolete, neither is it an "absurdity," as "H. A." accuses "S." of supposing. The reading of books, same as lawyers' clerks write copies, may please "H. A." I don't like to do my reading by time, but prefer to read, and then question the author (mentally, of course).—B. S.

[5880.]—**Architect, Builder, and Client.**—Cancel the certificate, and let the builder take his remedy at law. If there is sufficient cash retained the amount may be legally deducted, if not, it will be a bad case for the architect, whose employer may hold him liable for his neglect to see that the defect is made good, which must have been apparent from the fact of the architect's noting the same. If the builder is insolvent, of course nothing can be recovered from *him*, but the certifying architect is clearly liable. The oversight in certifying work complete which is not so cannot be taken advantage of by the contractor, however it may tell against the party certifying. If the contract contain the usual stipulation to repair and reinstate any defects for a stated time so much the better. As to clause 8, this results from a loose way of drawing up a specification. Why should the architect specify 4in. when he considers 3in. enough, and practically confirms it by allowing 3in.? The client, however unreasonable, may insist that he pays for more slating by a 4in. lap, and may demand it, whether there be any practical benefit or not. As a matter of practice I may say, after very much experience, that 3in. should be quite enough. I never specify more, and I have found the ordinary run of slating to have seldom been over 2½in., and do very well at that. The defect may be found in other matters, probably too flat a pitch, or loosely nailed, or wide or jagged nail holes, &c.—B.

STAINED GLASS.

Stratford-on-Avon.—Messrs. Lavers, Barraud, and Westlake have added another light in the American window over Shakespeare's tomb in the Church of the Holy Trinity, Stratford-on-Avon. This window is being subscribed for exclusively by American visitors to the poet's last resting-place. It will cost about 1,500 dollars. There are eight lights, seven of which are now finished. The subject is Shakespeare's Seven Ages, all illustrated from the Old Testament.

STATUES, MEMORIALS, &c.

Memorial of John Knox.—The committee who are promoting a monument of John Knox have commissioned Mr. Stevenson to execute the work. Figures of Patrick Hamilton, George Wishart, George Buchanan, and Andrew Melville are to be placed at the four corners of the pedestal. The place selected for the monument is in the square to the west of St. Giles's Church, facing the High-street, Edinburgh. It is estimated that the cost of the monument will not exceed £2,000.

WATER SUPPLY AND SANITARY MATTERS.

Barrow.—The Corporation of Barrow on Wednesday opened a new reservoir—constructed by them at Pennington, near Ulverston—of an area of 25 acres, and a holding capacity of 120,000,000 gallons. The reservoir is connected with the original waterworks at Poaka Beck by a tunnel, and the Corporation now own sufficient reservoir accommodation for a population of 80,000. The new works not only supply Barrow, but Dalton, Ulverston, and other parts of the Furness district. The cost of the new reservoir is £32,000.

LEGAL INTELLIGENCE.

Important Decision to Contractors and Others.—On Tuesday, the Axminster Bench of Magistrates were engaged for six hours, in hearing an action brought against Messrs. Ford and Son, timber merchants, of Gloucester, for injuring roads in the highway district by reason of excessive traffic. It appears defendants were engaged in hauling timber, but it was alleged their timber trucks were overladen, consequently they cut up the roads to a depth of 9in., doing damage to the amount of about £9, and were fined £5, and £1 19s. 7d. costs. Another merchant, of Colyton, Devon, for a similar offence, was fined £7, together with costs, 17s., for doing damage to the amount of £13 7s. 2d.

CHIPS.

From the annual report of the Local Government Board, just published, we see that considerable works are in progress in metropolitan poor-law buildings. At the date of the report, March 31st, the reconstruction of the workhouse for St. Giles and St. George, Bloomsbury, had been arranged for, new vagrant wards having been constructed. At Hampstead separate-berth casual-wards were in progress, while the Islington guardians are making extensive alterations in the Hornsey-road schools, and the schools at Lower Norwood, belonging to the Lambeth Union, are about to be enlarged. St. Marylebone had commenced the erection of an infirmary at Notting-hill, an infirmary at Edmonton, for the Strand Union, had been completed, and plans had been approved for additional infirmary accommodation and offices in St. George's-in-the-East.

An inquiry was held at Aylesbury on the 22nd ult., before Mr. J. T. Harrison, C.E., inspector to the Local Government Board, with reference to an application from the local board of that town for sanction to borrow a further sum of £5,000 for sewerage works, in addition to £14,900 already borrowed. The plans have been prepared by Mr. Hawksley, C.E. The inspector suggested that the plans must be reconsidered and the expenditure reduced, before the loan would be granted.

Our Office Table.

A lecture was delivered on Wednesday evening by Mr. J. Charles Cox, the Derbyshire archæologist, at Worksop, on "Steetley Chapel and the Neighbourhood." The chapel is of Late Norman architecture, and is situated on the Derbyshire border at Steetley, near Whitwell. Though roofless for the last three centuries, and given up to decay, it remains in fair structural preservation; the walls are still whole, and on the apse there is yet a portion of the original roof. Prior to 1875 it was used for some years as the breeding-house of a well-known line of game fowls, but in that year a public meeting was held at which it was decided to restore it. The chapel has been leased by the trustees of Worksop Manor to the rector of Whitwell, for fifty years, and it was to aid the funds for the restoration, estimated to cost £1,000, that Mr. Cox's lecture has been delivered.

The success which attended the recent exhibition of Westphalian antiquities at Münster and the previous exhibitions of historical art at Cologne and Frankfort has aroused the Senate and burghers of the old Hanseatic city of Lübeck to make a similar display. Accordingly, an exhibition was opened there yesterday of antiquities connected with art and industrial occupations and of artistic productions of the Middle Ages. Although time and war have laid destroying hands upon much that was valuable in the olden time, still it is believed that a large quantity of art treasures has been preserved in the churches and in the collections of the city and of private persons which will invest this exhibition with an interest not inferior to that of the Westphalian collection. The Lübeck exhibition will remain open for three weeks and is being held in the old Burgkloster, which has been lately restored.

Canon Venables complains in the *Times* that a work of destruction is going on in two places in the county of Somerset which threatens the gradual obliteration of two of our grandest primeval memorials. The earthwork of Castle Neroche, which looks down from its headland on the Vale of Taunton, is in process of destruction by road surveyors, who are carting away the gravel of its ramparts to mend the highways. Prebendary Scarth, at the recent visit of the Archæological Institute to the spot, uttered an indignant protest against this act of wanton barbarism. The other monument threatened is the still more interesting work known as Penpits, in the parish of Penselwood, not far from Wincanton. Here we have a primeval British metropolis, defended by lofty earthworks, and exhibiting within its fortified area those conical hollows which are so well known to antiquaries as the bases of primeval dwellings, the groups of huts or kraals of the former inhabitants of our land. These pits were here once numbered by thousands, but each year sees their number diminish by the process of levelling and filling up to gain a little more land for the plough; and if this continues at the present rate a few years will witness the total obliteration of this historic and archæological monument, which, according to Dr. Guest, was the scene of Kenwalch's victory over the Britons in 658, and still more certainly that of Edmund Ironside over Canute in 1016.

The circumstances arising out of the "Goffin case" have induced the Lords of the Committee of Council of Education to issue a circular calling the attention of local committees of science and art schools to the fact that the duties undertaken by them are a serious reality, and involve grave responsibility, public money being paid on the faith of their certificate that it has been properly earned. The Committee of the Council think that further precautions are necessary, and these are now under consideration. A change has already been made by which the period between the reception of the examination papers by the secretaries of the local committees and the examination itself is considerably diminished.

The Kirkcaldy Fine Art Association opened on Monday the eighth annual exhibition of paintings and statuary. Rejoicing this year in the presidency of Sir Coutts Lindsay, the Association has reason to congratulate itself on the success which has attended its efforts. Including water colours and sculpture, the present exhibition comprises 683 works of art, as compared with 546 for which space was found last year. The collection presents the usual features—a few typical examples of eminent artists, Scotch and English, chiefly obtained on loan; a considerable number of works, which have been seen in the galleries of the Royal Scottish Academy; and a pretty extensive display of that budding talent, at a more or less advanced stage of development, for which exhibitions of this character afford an outlet that might not otherwise be readily obtainable.

In a few months the London and South-Western Railway will possess a double line of rails throughout the whole system between London and Plymouth. The work of duplication on the North Tawton and Okehampton division was completed in January last, and the only remaining section is that between the latter town and Lydford, where the junction with the Great Western line from Plymouth takes place. On this portion of the line there are three large viaducts, two of stone and one huge iron structure bridging the Meldon Valley, and each will be doubled, in the latter case by the erection of a second viaduct, side by side with that which spans the gorge of Meldon, and connected to it by iron stanchions. In this valley the whole of the additional pillars are complete, and the twelve iron girders spanning it are in position. The turning of the arches for the Lake and the Lyd masonry viaducts has been commenced. The opening up of the hard, rocky cuttings, with which this section abounds, is already finished, and the ballast laid for the reception of the rails. Many of the smaller bridges are also complete. Mr. J. Brady is the contractor for the section between Okehampton and Bridestow; and Mr. Relf, of Okehampton, for the second section—from Bridestow to Lydford.

Mr. William Copeland Borlase, of Penzance, whose antiquarian researches in the Land's End district have attracted much notice, and who is, by the way, a descendant of the well-known Cornish historian of the same name, has just been rewarded by another "find." This is at Tregestal, where, in a croft, a barrow 40ft. in diameter by 10ft. in height has been explored, and an invested urn discovered, the largest perfect urn yet found in West Cornwall. Its measurement is 2ft. high and 18in. in diameter, and it has two handles, each 5in. in breadth. The upper portion is richly ornamented, and there is inside, at the bottom of the urn, the remarkable feature of an embossed cross. A sepulchral chamber was also found, 11ft. 6in. long, roofed over with large stones, and containing a thick stratum of burnt bones and other objects of interest.

Mr. J. Bailey Denton opportunely reminds us that just now, when so much public attention is being directed to the question of water supply, and when we are being so forcibly informed by continued and excessive rainfall of the immense quantity of water at our command, it may be well to suggest to those who take a special interest in the subject that they have it in their power to add very valuable information to the scanty hydrogeological knowledge we possess by measuring and recording the depth of water now existing in deep wells sunk in the water-bearing strata. He refers more particularly to the chalk and the new red sandstone, though the same information with regard to the greensand and other subterranean water-beds would be very useful. By comparing the present depth and the increasing depth which will result from the replenishment of the coming winter if the rain should not fall short, with the depths which have existed in previous years, we may learn whether the decline in the water level which has been observed in both the chalk and the new red standstone is still progressing, or will be wholly or partially recovered. Both under London in the chalk, and under Liverpool in the sandstone, the water had sunk 50ft., and the excessive rainfall with the reduced temperature under which the country has suffered this summer may result in restoring the balance. The value of a general rise of subterranean waters in those formations which feed our rivers will be acknowledged when it is remembered that, although our large populations may resort to distant sources for their supply, every town and village, if not already furnished, is looking out for pure water, and that up to this time many of the higher springs which flowed in 1842 have not yet put in a reappearance. With an average rainfall this coming winter following, as it will, a wet and cool summer and a previous wet winter, we may fairly look for a full replenishment of our underground supply.

The Mineral Statistics of the United Kingdom for 1878 have just been issued by the Keeper of Mining Records. The total value of the minerals produced last year was £56,264,495, more than £2,000,000 below the value of the minerals raised in 1877 (£58,398,071). That year already showed a small diminution as compared with 1876, the total for which was £58,691,832; and so low a return as the present has not been known since 1871. The amount of coal which was raised in 1878 exceeded in amount 132,600,000 tons, and was of the wholesale value of £46,412,753. Iron ore to the extent of 15,726,370 tons, worth £5,609,507, was raised. Of salt 2,682,930 tons, valued at £1,341,465, were extracted from mines and springs. The production was 20,000 tons less than in 1877, and the value £150,000 less. There were obtained 77,350 tons of lead ore, of the value (less by 3,000 tons and £400,000 than in 1877) of £801,428; and the clays, for the use of potters, for making porcelain, or for the purposes of fire-clay, realised £677,871, at an average rate of about 5s. a ton for 2,711,486 tons. In 1877 the average price was 20 per cent. lower, and the yield a little more. Of tin ore a larger quantity, at a lower price, was raised in 1878 than in 1877. Last year's return was 15,045 tons at £530,737. The produce of 1877 was 14,142 tons for £572,673. Sundry minerals, including shales, gypsum, calc, spar, coprolites, and phosphates, realised £512,000 from a production of 778,029 tons. Copper ore decreased considerably, in amount (from 73,141 tons to 56,094), and the 56,094 tons raised brought £201,434. Zinc weighing 25,438 tons and worth £80,565 was raised. Barytes produced £36,688 for 22,435 tons; arsenic, £26,900 for 4,991 tons; iron pyrites, £19,099 for 29,867 tons. Silver realised £5,994 from 94 tons 9cwt. of silver ore. Ochre and umber worth £4,038, and weighing 4,414 tons; manganese estimated at £3,120 for 1,586 tons; nickel ore valued at £616 for 98 tons 18cwt.; fluor spar weighed at 391 tons, and sold for £133; 10 tons of wolfram worth £100; and finally, 8cwt. of uranium valued at £44, complete the list. The ores produced in the United Kingdom turned out 702oz. of gold, valued at £2,848; 6,381,051 tons of pig-iron, worth £16,154,692; 10,106 tons of tin, worth £663,080; 3,952 tons of copper, worth £271,042; 58,020 tons of lead, valued at 972,491; 6,309 tons of zinc, valued at £123,025. Silver was obtained from lead to the amount of 397,471oz., and the value of £88,296; from silver ore the amount was 27,648oz., and the value £6,223.

The final opening of the Mississippi to the commerce of the world, as declared in the reports from Washington, seems to be an event of first-rate importance both from a commercial and from an engineering point of view. Captain Eads, by obstructing the flow of water through the secondary mouths of the river, so as to give greater volume to that passing through the South Pass, and by sinking the mattresses in two parallel jetties three miles long toward deep water on either side of this pass, has changed the depth of this mouth from six feet to thirty, and thus the maximum channel required is said to have been secured. This difficult feat has been accomplished in the face of innumerable obstacles; and even if, as it is asserted by some, the deepening of the channel is not permanent on account of the facility with which the detritus, washed down by the current of the great river, accumulates in bars at the outlets, sooner or later rendering necessary costly extensions and repairs of the jetty system, or a continued maintenance of an expensive system of dredging—even if Captain Eads' operations have not secured lasting results, he has indicated a practical way of making the great river scour out its own channels.

One of the last statutes passed in the late session was of a somewhat peculiar character. It is to authorise the Metropolitan Board of Works to defray the expenses incurred in the promotion of certain Bills in Parliament relating to the supply of water in the Metropolis. The Act recites that the Board did, during the last session (1878), in good faith, but beyond the powers conferred upon them, promote two Bills for the supply of water, and such Bills were read a first time in the House Commons and subsequently withdrawn. Certain expenses connected with the Bills were incurred, and the same had been disallowed by the auditor. The amount mentioned in the schedule, £15,146 17s. 5d., was incurred in "good faith," and, it is provided, may be defrayed, when audited and taxed, as if they were legally incurred by the Board in the execution of the Metropolis Management Act, 1855, and the other Acts. The expenses paid in 1878, and disallowed by the auditor, were £6,611 3s. 11d., and of that sum £1,045 15s. to counsel; and the amount paid in the present year, £8,535 13s. 6d., making £15,146 17s. 5d., was paid in good faith and in the belief that the Board was acting within the powers conferred on such Board.

Glue which will stand damp is a desideratum. Few, however, know how to judge of quality, except by the price they pay for it. But price is no criterion, neither is colour, upon which so many depend. Its adhesive and lasting properties depend more upon the material from which it is made, and the method of securing purity in the raw material, for if that is inferior and not well cleansed the product will have to be unduly charged with alum, or some other antiseptic, to make it keep during the drying process. Weathered glue is that which has experienced unfavourable weather while drying, at which time it is rather a delicate substance. To resist damp atmosphere well, it should contain as little saline matter as possible. When buying the article apply the tongue to it, and if it tastes salt or acid reject it for anything but the commonest purpose. The same operation will also bring out any bad smell the glue may have. These are simple and ready tests, and are the ones usually adopted by dealers and large consumers. Another good test is to soak a weighed portion of dry glue in cold water for twenty-four hours, then dry again, and weigh. The nearer it approaches to its original weight, the better glue it is, thereby showing its degree of insolubility. Glue frequently cracks because of the dryness of the air in rooms warmed by stoves. An Austrian paper recommends the addition of a little chloride of calcium to glue to prevent this.

The report of the Patent Law Committee of the Association for the reform and codification of the law of nations is published, and the resolutions will commend themselves to all who are desirous of seeing our patent laws put upon a proper footing. The report recognises the right of inventors to their productions as a right of property; it proposes that the fees levied should not be larger than is necessary to cover the expenses of the office, while the duration of a patent should be 21 years. The report contains some proposals as to examination before granting a patent which are not likely to commend themselves to inventors and others; but as the committee is composed of representative men, the report will receive the attention it undoubtedly deserves.

The Old Queen's Bench, standing at the east end of the Borough-road, Southwark, is destined to share the fate of the old Fleet, the Marshalsea, and White Cross-street prisons, and as a preliminary its stores were on Tuesday sold by auction. "The Bench" would seem to have been located in Southwark from a very early date, for during the "Wat Tyler" rebellion the Kentish rebels are stated to have broken down the houses of it and the Marshalsea. Where its then site in Southwark was is doubtful; but it may have been the same prison to which Henry the Fifth, when Prince of Wales, was committed by Chief Justice Gascoyne. It is clear, however, that it was erected on the present site in 1759, and although ten years after it fell a victim to the fury of the "No Popery" mob, it was very soon rebuilt, and continued in use as a debtor's prison down to the passing of Lord Westbury's Bankruptcy Act in 1861, when under that Act the debtors of all classes were released. After the exodus of the debtors the building was occupied for some time as a military prison. Some time after it was handed over to the Convict Department, in whose hands it has continued until recently. Now, however, Her Majesty's Office of Works announce that they are prepared to receive tenders for the purchase of the land connected with the establishment and the buildings. The sale on Tuesday was held in the old chapel of the buildings, which is in the centre of the debtors' quarter, the only indications of its having been once a place of worship being the four tablets on which are engraved the Ten Commandments, the Lord's Prayer, and the Apostles' Creed, which still remain. Messrs. Crispin and Horncastle were the auctioneers.

The rise in the value of poplar-wood during the past 10 years is somewhat remarkable. Mr. George Berry, of Longleat, in the *Journal of Forestry and Estates Management*, says he knows a London firm of timber merchants who are at all times ready to buy any big sound Abeles from Longleat that are for disposal. He believes the best butts are cut into veneering; some of the old trees when cut up exhibiting a beautiful woolley or fleecy pattern of grain, and when polished, without colouring matter, somewhat resemble satin-wood. Ten years ago good trees of any of the poplar species could be bought for from 4d. to 8d. per foot. Such is, however, not the case now, for the Abele timber is worth from 1s. to 1s. 6d. per foot, but the butts must be sound, clean, and of large dimensions to realise this price. Ordinary-sized trees, and of fair quality, sell from 10d. to 1s. per foot. The wood of the white poplar is white, soft, light, and very tough; it is used for bent ware, and is also made into various kinds of hoops for tubs, milk-pails, ship masts, &c. The timber is sawn into thin boards and strips, from three-eighths to five-eighths of an inch thick; it is then steeped and steamed to admit of its being bent with ease, and without splitting. It is also made into corn and other measures, corn shovels, bottoms of tubs and pails, posts for bedsteads, and frames for pictures, and used in cheap cabinet and turnery work, and in pianoforte manufactories.

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Holloway's Pills are suitable alike for the peer and the peasant; the soldier, sailor, and emigrant may rely on them as the means of banishing sickness in all climates, and under all circumstances. They readily check bilious and feverish attacks, and prevent inflammation of the brain, liver, lungs, and kidneys.—[Advt.]

Lamplough's Pyretic Saline is Refreshing, most agreeable, and the preventive of Fevers, Biliousness, Smallpox, Skin Diseases, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute*.—[Advt.]

CHIPS.

During the past quarter the excavation of the outer harbour at Scarborough has been proceeded with, but the contractors, Messrs. Shanks and Son, have met with unforeseen difficulties from quicksands. About 180ft. of a concrete wall, for widening the west pier is finished, and a further length of 80ft. has been brought up to the level of the sands, a quarter of the entire length of walling being founded.

The three-light east window, standing 16ft. high, of the Catholic Apostolic Church. Duncan-street, Islington, is being filled with stained glass. The subject is the "Ascension," and the glass is chiefly of foreign manufacture; but some of the prominent portions of the design have been prepared by Messrs. Powell, of Whitefriars.

The annual meeting of the Brighton District Association for Improving the Dwellings of the Industrious Classes was held on Thursday in last week. The directors' report was adopted, and a dividend of 15s. per share declared. The necessary steps were directed to be taken by the solicitors to obtain a reconveyance of the property of the Association from the trustees of the parent society.

A United Free Methodist chapel at Holloway, Derbyshire, was reopened on Sunday week after enlargement. A new warming apparatus, the invention of the architect, Mr. Eyre, of Codnor, has been fitted up. Mr. W. Limb, of Ambergate, was the builder, and Messrs. Wheeldon Bros., of Belper, executed the woodwork for new seating to gallery and rostrum.

A temperance hall at Landsdown, Stroud, was opened on Tuesday week. It is Early English in style and occupies an area of 80 by 45ft.; the lecture-room is 60ft. by 35ft. and 30ft. high. The cost has been £2,200.

"Bleak House," an old habitation supposed to have been the type of the house celebrated by Dickens, situated in St. Peter's-street, Islington, was totally destroyed by fire at an early hour on Sunday morning. The house was the property of Miss Warne, of St. Albans, Herts. The loss is estimated at over £2,000.

The third Congress of Students of American Antiquities will be held at Brussels from the 23rd to the 26th inst. King Leopold will preside. An open invitation to attend has been given to all Englishmen interested in the subject of archæology.

It has been decided to restore, re-seat, and partially rebuild the parish church of St. Giles, Wormhill, Kent. The proposed outlay, including repairs to tower, is £1,300.

The little church of Todber, Dorset, which had been closed and in disrepair for the past seven years, was reopened on Saturday week, having been partially rebuilt and enlarged at the cost of the Marchioness of Westminster. The builder and architect was Mr. G. Hiscock, assisted by Mr. Dean in the woodwork. The chief mason, Mr. G. Stainer, had been previously employed at Stalbridge Church, which has been recently restored. The oak chancel screen has been restored by Mr. Godwin, of Stoke Provost. A window has been filled with stained glass by Messrs. Lavers, Barraud, and Westlake, of London; it represents the "Good Shepherd Feeding His Sheep and Bearing His Cross." The sounding-board, which formerly overhung the Carolvian pulpit, has been worked up as a reredos.

The foundation-stone of a new church was laid at Prudhoe on Wednesday week. The church is in the Early English style, will be built of stone, and will seat 300 persons. The architect is Mr. Frank W. Rich, of Newcastle-on-Tyne; and the principal contracters are—Messrs. W. and J. Darlington, masons; Mr. Grisdale, joiner; Messrs. Kirk and Dickinson, slaters; and Messrs. Walker and Emley for ironwork.

New Board Schools, erected in Kingsmead by the Bath School Board, were opened by the mayor of that city on Wednesday week. They accommodate 250 infants on the first-floor. and 150 girls above, the basement being asphalted to serve as a covered playground. The total cost has been under £4,500, the outlay for the site being about £3 10s. per head, and for the building and furniture £7 10s. Mr. G. B. Oliver, of Bath, was the architect, and Messrs. Hayward and Worster were the contractors.

The foundation-stone of a new Roman Catholic Church, to be dedicated to St. Patrick, was laid at Walton-le-Dale, near Preston, on Saturday week.

The head of the Severn tunnel is making good progress, and the length under river will probably be completed before the end of the year. The enlargement and lining of the lower heading, to be used for the purposes of drainage and ventilation, will be commenced immediately. The material pierced by the workings has thus far proved of a very favourable character.

The town council of Yarmouth on Wednesday week opened thirteen tenders for the erection of the new town hall from designs by Mr. Pearce, of Norwich, selected in competition, and illustrated by us at the time. These very closely approximated to each other, and the lowest but one, that of Messrs. Lacey, of Norwich, was accepted at £26,200.

The Metropolitan Board of Works have just erected a new fire-brigade station for Greenwich, in what a local journal styles the "obscure corner" of Plumbridge-street, South-street. It comprises 21 rooms, with stables and wash-houses, and is surmounted by a lofty look-out tower. The front is of white stock bricks, with red and black brick facings. The station will be occupied at Michaelmas, and has been built from the designs of Mr. Alfred Mott. Messrs. Stimpson and Co., of Brompton-road, were the contractors, and Mr. Nicholass their foreman. The clerk-of-works was Mr. Estall.

The Town Council of Poole, Dorset, are negotiating for the purchase of the waterworks from a private company. The council offer £20,000, but the company ask just half as much again for the undertaking.

A public park has been presented to Barnstaple by Mr. W. F. Rock, a native of that town, and now a London merchant.

The old tower of St. Swithin's Church, Bathford, being considered out of keeping with the restored building, a new one is about to be erected, at a cost of £1,600. It has been designed by Mr. Preedy, of London, the architect for the restoration, and will be 100ft. high, with a turret at the south-west angle. The style will be Decorated.

A new Wesleyan chapel was opened at Newbold, near Rugby, on Monday.

The timber viaducts on the Cornwall Railway Company, which form so picturesque a feature of the combe scenery from the vicinity of the line, but which have occasioned much anxiety and expense to the company, are being gradually replaced by stone structures under the supervision of Mr. P. J. Margary, the engineer. That at Mooreswater has been completed during the past few days. In the whole of those on the incline between Doublebois and Liskeard timber has been substituted by masonry, except at Derricombe, which is about to be undertaken forthwith.

The Dublin Corporation on Monday passed a resolution authorising their artisans' dwellings committee to prepare a scheme or schemes, with estimates, in accordance with the facilities afforded by the Artisans' Dwellings Act, 1875, Amendment Act, 1879.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 12, 1879.

THE LATE EDWARD BLORE, F.S.A.

THE profession and many of the public will hear with feelings of regret that Mr. Edward Blore, D.C.L., F.R.S., F.S.A., died on the 4th instant, at his residence, 4, Manchester-square, at the ripe age of 90 years. Mr. Blore had been seriously indisposed, we understand, only for a few days before his death, and his friends had not expected so speedy a termination of his illness. He was born in Derbyshire, on September 13th, 1789, being the eldest son of Thomas Blore, F.S.A., a member of the Middle Temple, and the historian of the county of Rutland. Early displaying a natural bent as an artist, and a love for ecclesiastical architecture, he commenced a series of illustrations for the "History of Rutland," the first part of which appeared in 1811. Mr. Surtees, of Mainsforth, entered into arrangement with him to prepare drawings for the architectural plates to the "History and Antiquities of Durham"; and he soon became known to Mr. Britton, who also employed young Blore to make sketches for his histories of York and Peterborough cathedrals. He had now acquired a reputation as an accomplished and accurate draughtsman, and we find was constantly engaged to make drawings for illustrated works on county antiquities—a class of literature which had just commenced to become very popular. The engravings in Clutterbuck's "History of Hertfordshire," and other publications of a similar kind, were made from original sketches by Mr. Blore. His early acquaintance with Sir Walter Scott, and his connection with that fine work, "The Provincial Antiquities and Picturesque Scenery of Scotland," no doubt imbued the young student with fresh enthusiasm for the Mediæval beauties of his native country. In the production of this work he was associated with many artists of reputation, including Turner, Nasmyth, Calcott, and the Rev. J. Thomson. The engravings of these works display an advanced knowledge of the detail of the Mediæval style, and many of them are exceedingly truthful and delicately engraved. We now think of Mr. Blore as one of the earliest pioneers of the Gothic revival, but he belongs to a phase of architectural thought and feeling completely separated from our own by the intermediate age of restoration, of which Sir Gilbert Scott was the acknowledged exponent. The last-named great leader gathered in the harvest left ready by the labours of Augustus Pugin, James Wyatt, and Edward Blore. Pugin and Mr. Blore were chiefly delineators of the style; they aroused the national feeling of veneration for the remains of our forefathers; and we must regard their published works as having as great an influence on the future prospects of Gothic as any of the executed buildings they have left us. Their drawings were helping forward the great reaction in public taste which was going on, and which enabled other leading architects to reap so rich a harvest. While Holland, Wilkins, and Nash left their impress on the Classical architecture of the present century, stamping upon it a more modern and domesticated character, Blore was engaged, with John Britton, Pugin, and Le Keux, in gathering the materials for a new style, which threatened to overturn the older school of designers. Blore as a draughtsman and Le Keux as engraver, appeared at this epoch in almost constant association; Classical residences began to be Gothicised. Nash was largely employed in the capacity of transformer—and Gothic castles and residences appeared in wanton profusion. One of Blore's earliest works was the design for the exterior of the new house at Abbotsford, for Sir Walter Scott. He was engaged largely in the repair—we can hardly term it restoration—of several cathedrals. At Peterborough he designed and carried out several structural repairs, and the present organ-screen and choir fittings. The cathedral of Glasgow was almost a ruin when Mr. Blore was called upon to restore it, and we believe this was one of his most successful restorations. He was engaged at Ely, and upon several other cathedrals and churches. His work at Westminster Abbey, to which he was appointed the architect previous to Sir Gilbert Scott, consisted mainly, we believe, of the screen between the nave and choir, and the stalls. Of his more recent ecclesiastical works, we may mention a church designed for Lord Belper, whose residence in Derbyshire he also planned, also the font and canopy in the Chapel Royal of the Savoy. Of the latter Mr. Henry White, writing in the *Times*, observes:—"Mr. Blore came out of his retirement to pay homage to the memory of his old friends, Peter de Wint and William Hilton. The memorial is both a fitting tribute to the genius of the two artists, and a worthy example of the skill and taste of the venerable architect."

As an instance of his skill as a designer of domestic buildings, we may refer to the residence at Lambeth-palace, for Archbishop Howley, which he entirely rebuilt in a Perpendicular style — a work in every way worthy of the time. The chapel and library were restored also by Mr. Blore. As an architect, we find him more largely engaged also in works of a domestic character, and houses in many parts of the kingdom have been built or remodelled by him. We may casually mention Lord Ellesmere's house, Worsley, near Manchester; residence for Lord Earne, Cron-castle, Ireland; the former Crewe-hall, for Lord Crewe, burnt down a few years ago and restored by Mr. E. M. Barry. The palace of Aloupka, in the Crimea, was erected by Prince Woronzow entirely after his designs. One work, which will be always associated more or less with Mr. Blore's name, is Buckingham-palace. Nash had commenced the building, but the front towards the Green-park is due to Mr. Blore, who was employed to complete the works for £100,000. In this instance he carried out the plainest of his designs at a less sum than estimated. It may be in the recollection of some of our readers that the Green-park façade was much criticised at the time, and it is only fair to the memory of the late Mr. Blore to mention that the original design by that gentleman, which was much superior as a work of art, and more worthy of the town residence of the sovereign, was rejected for a less costly design. The original design showed two towers breaking the façade. Mr. Blore was appointed architect to King William IV, and afterward acted in a similar capacity for Her Majesty the Queen. Several works at Windsor Castle were also designed and carried out by him. Mr. Blore retired from his profession, or at least the active part of it, about thirty years ago, just when Sir Gilbert Scott was enjoying the full swing of his practice. But he never wholly forsook his love for it. He was constantly engaged in works of a private kind, giving advice to numerous friends and patrons, and sometimes designing works or restorations for them. As a recognition of the eminence he had reached in his profession, the honorary degree of D.C.L. was conferred upon him at Oxford; and it is worthy of remark that he declined the honour of knighthood offered him by his Majesty, after his engagement at Buckingham Palace. Mr. Blore's drawings were chiefly in pencil, and comprise nearly every important monument in the kingdom. One of his chief works, and quite a monument of labour and exquisite draughtsmanship, is "The Monumental Remains of Noble and Eminent Persons, comprising the Sepulchral Antiquities of Great Britain." The engravings are by Le Keux, and are exceedingly spirited, true in detail and delicate in execution. The tombs and memorials of stone and brass of every great name are here faithfully delineated and described. We understand his collection of sketches of churches, castles, and other antiquities is immense, and we hope the profession will have an opportunity of inspecting them at no distant period. Those who have the works of Britton will find many exquisite examples of the drawing and etching of Mr. Blore. The nave of Winchester in "Britton's Antiquities," and the illustrations of the Norman fonts of Winchester, East Meon, Canterbury, &c., therein engraved, are excellent examples of his work, exhibiting an accuracy in detail and proportion that will bear comparison with any recent works. The names of Edward Pretty, A. Pugin, Adey Repton, Cattermole, J. Carter, F. Mackenzie often appear in association with that of Mr. Blore in these publications, adding to their value as standard works on mediæval architecture. Mr. Blore was a member of many learned bodies, and was also honorary member of many provincial archæological societies. He was, in conjunction with Mr. Albert Way, one of the founders of the Royal Archæological Institute, and was on the council of that society. He was also on the council of the Society of Antiquaries, of which he became a fellow. Mr. Blore has survived his wife about 12 years. She was the daughter of the Rev. W. Hodges, Vicar of Mattersey, Nottinghamshire, and by her he had two sons, the Rev. E. W. Blore, M.A., Senior Fellow of Trinity College, Cambridge, and the Rev. G. J. Blore, D.D., Head Master of the King's School, Canterbury. One of his daughters married the late Dr. Cureton, Canon of Westminster, and another Mr. Charles Keyser, of Stanmore. The remains of the deceased gentleman were interred at Highgate Cemetery last Tuesday. In the close of his lengthened career we seem to have lost the last surviving link which bound the past generation of architects to our own.

BOW CHURCH.

NEARLY a year ago an alarm was raised that the fine historic City church of St. Mary-le-Bow, one of Wren's Classical masterpieces, was in imminent danger. The *Times*, in a long leader, helped to spread the scare. A scaffolding encased the steeple, and it was forthwith declared to be for some portentous purpose; a few seats were in process of removal in the interior, and a hasty conclusion was therefrom drawn that some startling changes were contemplated. We referred at some length to the matter (see BUILDING NEWS, p. 469, Vol. XXXV.), and discussed the alterations complained of we now lay before our readers what has actually been accomplished. First, as to the steeple, which so aroused the apprehension of our contemporary. Anybody will now find the steeple, stone for stone, what it was when first erected. Not the slightest change has been made in its detail, except that certain decayed and dangerous stones have been replaced with sound ones, and the stability of the structure insured. The erection of the "portentous scaffolding" has not only left the steeple intact, but has materially added to its renewed existence as a work of architectural beauty. Every other part of the exterior is precisely as it was before the alterations were commenced, with this difference, that the fabric looks fresher and better for its cleaning. Now, as regards the interior. We find the rearrangement of the interior complained of amounts simply to the removal of the old "sleeping boxes" or pews of twenty years ago, and the substitution of substantial and well-designed seats, and the lowering of the main floor of the church about one step, thus raising by that much the chancel end. The fact is, and we repeat it, that the original flooring sloped from east to west, but when the alterations and repewing of 1867 were made, the architect had not perceived this fall, and to avoid a step into the seats at the west end, the floor at this part was raised. The rearrangement of the east end consists simply, then, in defining the true boundary of the congregation and choir by raising the chancel one step, and by forming stalls on each side for the clergy and choir. We find from an inspection of the interior that this has been accomplished in the simplest and most effective manner. The raised chancel occupies the chief portion of the easternmost of the three bays which divide the church in length. The step is of polished veined marble, and extends across both aisles, the paving of chancel floor being of tiles, laid in a large rectangular or panelled pattern, the colours being white, buff or drab, blue, and black. The pavement of the main body of the church is composed of similar colours, disposed in diamonds and squares, and the whole appearance of the flooring, by its quietness of design and unobtrusive colours, adds immensely to the effect of the interior. The seating occupies the central area, and is composed of open benches, with plain square ends and sloped backs, book boards, with flat capping on the ends, moulded on the edge, the whole being of dark pitch pine, varnished. In the design and arrangement of the stalls, Mr. Blomfield has judiciously avoided anything that would destroy the character and simplicity of Wren's simple ritual arrangements. The stalls are placed on each side of the chancel, and are of polished oak, panelled to agree with the old woodwork, and have carved ends thoroughly in harmony with the style. The old altar-table has been cleaned and repolished; it is of interesting design, and is framed as a table, with four massively carved legs, strengthened by a rail below. It is surrounded by the fine old oak railing of twisted and carved balusters, and massive capping black with age. But the most noticeable improvement in this part of the church is the removal of the pulpit and reading-desk from their former central and inconvenient positions near the communion railing to the sides, thus opening up the chancel, and adding sensibly to the length of the church and to the facility for hearing and seeing. The position of the pulpit is close to the north-eastern pier. It is an extremely interesting specimen of the carved woodwork of the 17th century; of octagon shape, it has panels surrounded by some remarkably vigorous carving in high relief, both in the mouldings and angle stiles. Under the capping the lion and unicorn is carved on each side, and the whole is raised on a well-moulded stone base. A brass eagle lectern stands in the centre of church. We are glad to find the old oak reredos under the east window has not been interfered with. We may inform those who do not know it that the design is enriched by coupled Corinthian pilasters fluted on each side, inclosing a panel in the centre, in which the Commandments are placed. The frieze contains some good folial carving in relief. We are sorry to find the centre east window and the side ones are still destitute of stained-glass. The southern aisle windows have been filled with some well-designed glass in geometrical patterns; each centre is filled with panels of rectangular shape, and round the border are a series of circular medallions, the whole being in grey and orange tints, well harmonised. The old centre western window is a fine conventional design, in which foliage is disposed in three panels, with a rich border, the colouring extremely harmonious and subdued. The dingy drab of the walls and ceiling which formerly prevailed and obscured all architectural features, has been changed for a light warm stone colour or light salmon tint, the capitals of the Corinthian order, and the entablatures above them, together with the ribs and moulded members of the elliptical ceiling, are painted white, touched with gold. The panels of ceiling remain of a white or drab colour, the mouldings being picked out with gold; the elliptical cross ribs which spring from the columns have been relieved by gilding the sunken panels and leaving the rosettes white, while the longitudinal beams are finished with a yellow or buff ground, the foliage picked out in white and gold. There is a new inner porch of oak to the west doorway; this has a pediment with carved frieze panels above the door. The leaf ornament of the architrave, so prevailing a feature of Wren's work, has been boldly introduced, and the porch, but for its colour, might be mistaken for one of the original fittings. The large screen, enriched by fluted pilasters, forming the main northern entrance from the tower, is preserved, and is a very fine specimen of woodwork of the time. The date of its erection is 1716. The outer oak porch has also been cleaned, and looks as fresh as new; and Mr. Blomfield, no doubt, took this as a type for his western porch. In the north bay of aisle there is an organ of plain design. The old stoves have been placed in the central bays of side aisles, above which are circular windows. A few interesting monuments are to be seen in Bow Church. These have been cleaned or rearranged. At the west end is a finely-sculptured memorial, with busts in relief, of Col Charles Bainton, who died 1712. The sculpture and trophy over are interesting specimens of this period. The old font, with its plain scalloped bowl and pedestal, has been placed on the south side of the western entrance. On the other side we see monuments to Dr. T. Newton, rector of this parish, Dean of St. Paul's, and Bishop of Bristol, who died 1782, while the north-western bay of aisle has an elaborate marble monument to James Cart, with bust inclosed under a Classic pediment with Corinthian columns.

The vestibule has been cleaned and coloured, a stained-glass window inserted, and the outer tower lobby has its fine groined ceiling cleaned and whitened. We have already, in our former notice, described the general architectural features and peculiarities of this fine City church; we have now only to observe that Mr. Blomfield has conscientiously restored the structure to its original purpose; no structural alteration has been contemplated or made in Wren's design, the principal changes being the reseating and the preservation of the architectural propriety, order, and features of the fabric, and that there was not the slightest shadow of foundation for the alleged remodelling of the ritual and architectural arrangements of the church. Those who visit it on its reopening on Sunday next will see the church as Wren himself would probably have finished it, had opportunities been more favourable.

THE EXHIBITION OF MODERN PICTURES AT BRIGHTON.

As a provincial exhibition, the one annually opened at Brighton may be taken as a very fair representative of its class. The present sixth annual exhibition just opened at the Royal Pavilion Gallery well sustains the reputation of former displays, and the Pavilion Committee of the Town Council are to be congratulated on the selection of the works hung on the walls. Landscape, *genre*, and still-life form by far the largest portion of the pictures, and the names of several leading painters are to be found among the number who contribute works. We find, for instance, some characteristic works by T. Sidney Cooper, R.A., E. Hayes, R.H.A., J. E. Millais, R.A., P. R. Morris, A.R.A., E. Prittie, A.R.H.A., W. F. Woodington, A.R.A., G. L. F. Beetholme, W. H. Bartlett, Frank Dillon, C. Marshall, H. T. Schäfer, T. Pyne, C. Wünnenberg, W. Britten, Howard Helmick, A. MacCallum, E. G. H. Lucas, J. Williamson, Mrs. C. E. Amyot, E. P. Constable, W. Logsdail, David Law, T. J. Lawson, Dora Carpenter, H. Haig, &c. Walking round the gallery, No. 30, "La Curieuse," by Mme. Delphine De Cool, strikes us as a carefully-drawn figure study of the dress and manners of Louis XVI. A gentleman seated reading is intruded upon by two elegantly-attired damsels in light dresses, who appear to have stealthily entered the room. The colouring is rich, but softly toned, and the elegant gilt table and furniture are introduced with good taste. "Oranges" (29) is a group painted with much truthfulness; the blue vase and peeled oranges make up a rich harmony of colour. "Music" (49) is the title of an ideal composition we have before seen somewhere; the figures are graceful, though the drawing of the one on the left looks faulty, and the composition lacks unity. Mr. William Britten is the artist, and the picture has been lent by Capt. H. Hill. Mr. Allen C. Seal's "Mussel Gatherers" (50) is a quietly and broadly-handled piece, showing a stretch of river bank. Carefully painted is Peter Deakins' picture of "The Grove" (48). The early morning effect sought to be depicted is cleverly rendered; the grove of trees looks fresh and quiet in the morning air, and there is a pleasing transparency in the colouring. A rough coast scene, "A Cornish Coast" (52), admirably displays Mr. W. T. Richard's power for painting scenes of this class; the rocks are vigorously introduced. One of the few pathetic pictures on the walls is Mr. Lionel T. Cowen's "Eyes to the Blind" (53). The face and hands of the aged blind woman, who is reading the raised letters, the inquiring glance of the boy who is endeavouring to find out how the woman can read, and the pitiful face of his little sister are all truthfully portrayed. The colouring is subdued, and the execution careful. "On the Terne, at Powick, near Worcester," by E. Tyrel De Paix, is a large landscape with a stormy-looking sky, and rather cold in its tone. Mr. F. G. Kinnaird's "Colleen Bawn" has a pretty, thoroughly characteristic face; the plaid-shawl, red skirt, and chestnut hair blend pleasingly together. "Home" is the name of a picture by A. G. Clabburn that depicts a very commonplace incident; an old man is reading the newspaper, while his wife and daughter are apparently engaged in conversation, but we have to find fault rather with the drawing and colouring. The young lady reposing has too long a limb; the room is faulty in perspective; the mirror and chimney-piece are glaringly out of drawing; the drapery is poor; and the colouring crude. A very fine landscape is No. 84, "The Mountain of the Holy Cross, Colorado, U.S.A." We might almost fancy a grand Alpine mountain before us. The artist, T. Moran, has forcibly represented the effect of sunlight and mist; the light and shade is introduced with masterly knowledge; and the rocky foreground and mountain torrent produce a very grand *ensemble*. "Little Wisdom" we have seen before. It is by Miss Maria Brooks, and is a burlesque of a diminutive demurely-clad and visaged little girl. Mr. Frank Dillon's "Japanese Interior" is delightfully fresh and bright looking. The interior and decorative accessories are very faithfully and minutely painted, and exhibit a knowledge of Japanese construction and detail. It is also a suggestive picture. "Dog Mart" (94), "Winter Evening," by A. De Leeuw, "Kelp Gatherers," by F. G. Kinnaird, and some others we found in this part of the room are worth notice. No. 103, "The Morning Walk," by C. Wünnenberg, is especially clever; the figure of the girl, the stone steps, &c., are well and broadly painted. 112 is too black to please us. It is the "Kingly Vale, Sussex," a grand wood of stately trees; but Mr. A. Robinson has, in the intenseness of the shadow, lost the effect. "A Sea Anemone" (141) is a pretty conceit, gracefully painted, by Arthur Verey. "The Old Mill, Isfield, Sussex," is rich and autumnal in its tints, the mill and the distance being both cleverly painted. Figure subjects are largely represented. We notice 150, "Somebody's Darling," by A. Phillips, as a freely and vigorously-painted English maiden. Bright and fair and transparently handled are the reflected and half-tints of the face. A setting of light green foliage helps to throw up the figure. No. 149 is equally clever as a masterly portrait of "An Old Spaniard," by Mme. Delphine de Cool. The picturesque, broad-brimmed hat and the smiling and highly expressive face over which the shadows play are feelingly executed. "Bosham, near Chichester," 152, has been quietly and truthfully depicted by W. H. Mason; and we observe a few other striking bits of Sussex architecture and scenery in Mr. Alison's "Old Inn," 173, "Shoreham Harbour," 177, "Old Cottage, Hastings." &c. The *chef d'œuvre* of this year's exhibition is a large picture, No. 202, which occupies the end of the gallery, and is called "The Brigand's Cave." The painting is executed by Michele Cammarano, and represents the seizure of a cave by a party of Bersagliere. It is remarkable no less for the thrilling scene, the vigour and power of the handling of the painting, than for exhibiting the active measures taken by the Italian Government to suppress brigandage. The faces of the women who are bound with iron to their hands, the boy who is being examined by the captain, and the grouping and accessories of the cavern are of the highest order of merit. The figures are well relieved by the dark background and chiaroscuro. The description informs us the picture was painted in 1876, and was exhibited in the Naples Exposition of 1877; the post of honour was assigned to it, but the Syndic objected to so unpatriotic a subject. King Victor Emmanuel wished to purchase it, but his Ministers became clamorous, and a senseless outcry was made against it. We are informed the faces of the women who are anxious lest their male co-partners should be found out, and that of the boy, came from real types. "Besieged for a Song," 161, by V. Ormsby, depicts a domestic scene. A party of ladies, attired in the costume and head-dress of the time of Louis XVI., are pressing a gentleman for a song. The grouping of figures round the table, the green-painted wall and architectural accessories are carefully rendered. A very masterly work is "Spring Time," 189, by C. Bauerlé, two rosy children smelling a yellow flower in a vase. The sentiment, colouring, and handling are admirable and spirited. An ably-conceived picture is entitled "Cradled in His Calling," by P. R. Morris, A.R.A. Mr. Morris has here worked out with considerable feeling and breadth this idea. A group of fishermen are carrying a child along a meadow to the sea. There is a pleasing balance of colour, and the harmony of the green and the blue sea, with its fleet of boats, is refreshing. Excellent in drawing and quiet in tone is C. Wünnenberg's "After the Confession." A lady of prepossessing appearance is leaving the confessional, through the opening of which the priest is taking a furtive glance. Refreshing and simple is 252, "O'er the Muir among the Heather," by Christopher Patten; the masses of purple heather in the rocky foreground and the distance make a pleasing harmony, and the execution is creditable. No. 262, "The Scale of C., a lesson in Common Time," by W. H. Bartlett, is a simple incident, but there is an unpleasant stiffness about the drapery. No. 289, "The Charlatan," is a scene of country festivity depicted with dramatic skill. The group of old farmers and the other sight-seers, eagerly witnessing the tricks of the old mountebank, are well painted. One of the most touching paintings is "The Return of the Penitent" (320), by Mrs. C. E. Amyot. It represents a penitent daughter kneeling, her face covered by her hands, before her father and mother. The father is relentless in rage; the mother, with feeling betrayed in her eyes, seeks to restrain his passion; while on the other side of him another daughter supplicates for pity. The expressions of appeal on the countenances, and the anger on the father's face, are skilfully delineated, and the accessories are painted with considerable freedom. Mrs. Amyot's "Poor Little Cupid," 303, showing a girl in rich brocaded silk dress sitting on the floor examining a broken Cupid, has a fine harmony of colour, and the handling is characterised by much breadth. A forcible transcript of nature is 315, "On the Lyn, North Devon," by W. S. Cooper; the rising hill, clad with foliage, the foreground &c., are painted with much depth and truthfulness. No. 316 is also a forcible piece.

We cannot overlook other admirable landscapes, and it must suffice to mention the names only of some of these. "The Thames from Richmond Hill," 151, is a soft and sunny landscape, and we can almost see the balmy air; "Old Cottage, Critchmere, Surrey," 144, is quiet; No. 176, "Under the Beeches," by S. Bowers, is transparent and gleaming in the sunlight through the trees; No. 177, "Shoreham Harbour," by W. Jenner, is effective; and 191, "Coast Scene," by James Webb, has a very fine sky and sea, broadly handled. No. 239 is truthful in grouping and colour, by Francesco Bensa. "Feathered Friends," by H. T. Schafer, 215, is a pleasing and decorative subject; 240 is a little harsh; so is No. 247, "The Introduction." Some good heads adorn the screen. We note Nos. 603, by Harriette G. Grace, representing "Evangeline"; 593, by E. Black; 589, portrait of an old woman with wrinkled face and hands; 611, 544, 555. Architectural subjects are not numerous, although there are a few cleverly-painted sketches of old buildings in Sussex and elsewhere: as "Street Scene, Bruges," by Dora Carpenter, 542; "Arundel Castle," by J. M. Nias; "Porch of Cuckfield Church," 536; "View of Henfield Church," by George S. Lawson; "The Old Workhouse, Uckfield, Southwick, Sussex," 635; "Ruins of Aldrington Church," "The Rialto, Venice," and "Piazetta, Venice," by W. W. Warren; No. 363, by L. Lewis; "A Warwickshire Farmhouse," 499, is a rich specimen of brick and timbered house-building, by W. Logsdail. Groups of still-life are favourite subjects of study. We note, for instance, Nos. 551 and 557 as clever harmonies of colour, the first a green vase with bronze cup and grapes, and bas-relief background, and the latter earthenware, with marble background, wonderfully true in texture. Nos. 573, "Out for a Day's Fishing," and 576, "On Pleasure Bent," by H. S. Farncombe, are clever studies, though a little stiff. We also note Nos. 536, 577, 523, 556, 521 among the other pictures worthy of observation.

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A new dispensary and cottage hospital has just been completed on the Crofts, at Ross, Herefordshire. Messrs. Crowe, Bros. were the contractors, and the outlay has been about £2,300.

FARM PLANS AT KILBURN.

NOW that the correspondence relative to designs for farm buildings at the Kilburn show seems to have come to a conclusion, and the competitors have vented their indignation pretty freely in the columns of the BUILDING NEWS and other journals more specially devoted to agricultural belongings, it may be well to take a retrospective survey of the matter generally, and also of the Royal Agricultural Society's previous connection with prize competition plans. In 1861 we find prizes—in connection with the Yorkshire Agricultural Society—being offered of "£50 for the best plan of farm buildings suitable for a farm of not less than 500 acres, and providing for the use of steam-power, and £25 for farm buildings adapted for a farm of 200 acres." In this, as in the 1879 competition, the vague and indefinite instructions thus issued, gave rise to no inconsiderable amount of uncertainty as to their meaning, and which permitted competitors to adapt their ideas to any size farm from 500 to 5,000 acres if they felt so disposed; nor was any information afforded as to the accommodation required, the materials proposed to be adopted, or the limit of cost. When further and clearer information was sought, the same tactics seem to have been pursued as at Kilburn, viz.—advising inquirers to use their own discretion in the matter; and, naturally enough, this gave rise to legitimate complaint, well expressed in a letter to a contemporary, wherein the writer says:—"Doubtless competition is thoroughly English, and one of our noblest characteristics is the love of 'a fair field and no favour,' but the slovenly mode in which competitions are usually carried out cannot be beneficial to the public, or otherwise than unjust to the profession. Neither can it be productive of anything but disappointment to both parties. Surely it behoves all architects to do justice to themselves, at least, by insisting on a fair definition of the extent, class, &c., of the accommodation required, and of the system to be adopted in the adjudication of the premiums. If a fair field and no favour could be insured, many a loyal and conscientious man would strive for the chance of winning credit for himself and benefit for both parties." However, the result was, at any rate, more satisfactory than that of subsequent awards by the Royal Agricultural Society, as the £50 prize fell to Mr. Watson, F.R.I.B.A., of Newcastle, who, with eighteen years' further experience in designing farm buildings, has evidently not kept pace with the requirements of the Society, if the fiat of the judges at Kilburn, where Mr. Watson was again a competitor, is to be taken as conclusive. In 1872 prizes were offered for plans of labourers' cottages to be exhibited at the Cardiff meeting,—£20 to be given by the Marquis of Bute for the best, and £10 by Major Picton Turberville for the second best design. The conditions stipulated for "plans, sections, and elevations to a quarter-inch scale,—with detailed plans and a priced bill of quantities." A fixed schedule of prices was also attached,—the accommodation was to consist of five rooms, and the usual offices for each cottage, and the total expenditure was not to exceed £220 per pair. The result was that 52 sets of plans, specifications and estimates were submitted, and,—no award made. That there were good, bad, and indifferent designs was to be expected, and that every known expedient should be introduced to bring the estimated outlay within the limit was a matter of course. Whether it is possible to build semi-detached cottages of five rooms each, in a substantial manner, well drained and ventilated, durable and weatherproof, and provided with the necessary outbuildings, for £220 a pair is a question open to considerable doubt; at any rate, the Society should not have offered rewards for solving the difficulty unless reasonable grounds existed for assuming it were possible in the majority of agricultural districts, as this specific sum—fixed by the Royal Agricultural Society—would be looked upon by landowners and agents as the precise amount they ought to pay for well built, roomy labourers' cottages; and their architects and builders, knowing the fallacy of this view, would, in the majority of cases, stand in their clients' estimation as being incapable of carrying out buildings as economically as might be the case. Under any circumstances the competitors can scarcely have considered themselves well treated, when ten shillings entrance fee was demanded for each set of plans, which (the plans) were returned after the show was over, many considerably damaged,—some without the cases in which they were sent for protection,—and not only the carriage, but a paltry booking fee of two pence each, left for the owners to pay on their arrival. No further information as to the judges' award than that derived from the public press was given the exhibitors, and the only communication was a trade "memorandum" from a Taunton contractor, across which was written, "Your plan has been returned this day."

It is fairly conclusive, therefore, that as the whole of the entrance fees were net profit, the transaction was commercially an item carried to the credit side of the Society's ledger, but certainly not to the credit side of the Society's good name.

In an International Exhibition, designs for farm buildings would naturally be supposed to form an important class of exhibits, and instructions to intending competitors were issued in due course for the Kilburn meeting, the conditions being, as usual, remarkable for their brevity.

The full text was as follows:—

METROPOLITAN EXHIBITION.

Plans of Farm Buildings.

For arable farms above 300 acres..	£50 prize
For arable farms not exceeding 300 acres........................	50 ,,
For dairy farms above 100 acres ..	50 ,,
For dairy farms not exceeding 100 acres........................	50 ,,

The plans, on a scale of 8 feet to the inch, with complete specification and money bills of quantities, must be sent in, addressed to the Secretary, so as to reach 12, Hanover-square, on or before June 26th, 1879.

The result of such vague instructions was natural and inevitable; and, as one competitor, out of several who applied to the secretary for more lucid information, pointed out, that as no locality is given for the site of buildings, prices would be of no value, but would rather tend to mislead. As an instance, this competitor mentioned that he was then erecting a large range of farm buildings where the schedule price of 9-inch brickwork was 6s. per superficial yard, and stated that he was also carrying out some works within 30 miles of these buildings where the price was 3s. 6d. only. In one case materials and labour were close at hand, but in the other there was four miles cartage to pay. If the Society had given a schedule of prices of some of the principal items, it would have avoided this difficulty. Again, complete specifications and quantities being demanded, the expense to competitors was a serious item. One competitor incurred an outlay of at least £80 for clerks' salaries alone, and, it need scarcely be added, such a one would experience great disappointment if his plans were rejected solely on account of the scale of prices. It might be supposed that such moderate and reasonable suggestions would, at least, have received some consideration at the hands of the Council; instead of which, the only notice vouchsafed was a reply that "competitors may state the locality for which their estimates are priced, if they desire to convey the idea that their prices are special to any particular district." Another most important issue was also raised—did the words "farm-buildings" include a farm-house? As a rule, and in its strictest sense, a farm-house is not included in the definition "farm-buildings;" and one of the judges, in his "Farm Homesteads of England," more than once uses the words, "farmstead *and* house;" at any rate, where a doubt of the kind exists, the conditions should have been clear, and if an error of omission occurred, the Council should at the earliest opportunity, in common justice, publicly have made known their intentions. When, however, the question was raised, it was met by the reply: "It is not necessary that there should be a dwelling house on the plans, but that will rest entirely with the competitors." On good authority it is stated that the judges proposed, when the plans were submitted to them, to reject as incomplete all those that did not include a dwelling house, but that their proposition was overruled by the decision of the Council. What would be said if some influential body—say the Royal Institute of British Architects—being desirous, for the benefit of the public at large, of obtaining designs for a dwelling house, and which might, to a great extent, serve as models, were to advertise for plans, specifications and estimates for a house, suitable for occupiers possessing an income of not less than £1000 a year, and on application refused to say what part of the world the house was assumed to be suited for, what site it should be adapted to, what it was to be built with, and what should be the limit of size and cost? With a farm-buildings competition the case is even far worse; for so many different opinions exist as to the requirements adapted to the altered system of modern farming, that it was simply unreasonable not to supply data whereby the plans would have assumed a certain amount of unanimity in their principal features. For instance, covered stock yards are considered by advanced farmers an absolute necessity in the east and north of England, but in the milder climate of the west of England they find less favour; consequently some of the designs had all covered yards—others all open—while not a few were part covered and part open, and some were accompanied with the cautious qualification that they were adapted for covered or open yards, as preferred, evidently showing that the designers had in view the difficulties of the case. Again, on large holdings, the corn is sometimes brought from the ricks, threshed, and the straw chaffed in the permanent buildings of the farmstead by fixed machinery, or both operations may be performed by portable engine and machines moved from stack to stack. General opinion leans, no doubt, to the usual practice of threshing in the field for economy in labour, but this opinion is not absolute, and the custom may be controlled by local circumstances and the quantity and disposition of the tillage land belonging to a farm. At any rate, in the competing plans, this difference of opinion rendered necessary in the latter case merely a moderate amount of stowage room, whereas in the former, accommodation was required for fixed engine, boiler, and machinery, besides ample space for converting the products of the farm into suitable cattle food. In point of fact, therefore, designers were not only called upon to arrange their buildings in the best possible manner for convenience and economy, but to combine therewith their own views as to certain practical points in agriculture, and if these latter were not in conformity with the judges' views of the matter, their plans, however good in design and arrangement for a certain style of farming, might be considered as certain of rejection. It is only fair to assume that any society devoted to the acquirement and diffusion of the best information and soundest principles of one particular science, should be—as far as that science was concerned—in the best position to give advice; and if the Royal Agricultural Society had simply defined what general system of agriculture they considered best, combined with an approximate statement of the accommodation to be provided for both live and dead stock, and then left competitors to design their buildings adapted to that system and approximation, some beneficial results might have accrued. But with all these drawbacks and difficulties, the honourable distinction of being first in a competition open to all comers, and under the auspices of so famous a society, brought together sixty-eight sets of plans, specifications, and estimates, to be judged according to their merits. Whether this class of exhibits was, in general estimation, compared with other classes in the show, so insignificant that it had altogether escaped the memory of the Council, or if otherwise, from what cause the judges should not have been informed that their services were needed before the day of opening it is difficult to find out; but it is none the less certain that the farce of examining about 220 sheets of drawings and—speaking well within bounds—over 1000 folios of specifications and estimates, was not attempted until after the show was open, and not decided until the close of the third day of the exhibition, during which interval the public was not admitted to see them. No other competitors were treated thus, and it is doubtful if any others would, as a class, have submitted quietly to so much injustice. Many authors of designs and others came long distances on the early days of the show, purposely to be able to examine the plans better than when large numbers of visitors might fairly be expected—and left the show-yard without obtaining even a glance at them. The closing of the building during the three most likely days for exhibitors to benefit from the inspection of their plans was, however, only a fitting prelude to the unsatisfactory termination, when sixty-eight competitors—many of whom were men of large experience in the construction of farmsteads and in farm management—were practically told "You know nothing about it." The actual wording of the decision was as follows:—

R. A. S. E.

Farm Plans.—Report of Judges.

We have carefully examined the 68 sets of plans submitted in competition in four Classes for the prizes offered by the Society, and have to state that, although, as a whole, they display much architectural power, and in many instances, considerable practical knowledge of farming requirements, there are none that combine superior arrangement of details with that economy of cost which is essential.

We therefore abstain from awarding a prize in either Class, but select as worthy of commendation:—

In Class I.	No. 7.	Colonicus.
	12.	Practice with economy.
	18.	Utility.
	20.	Experientia.
In Class II.	No. 30.	The eye of the Master is necessary to the due Economy of Labour.
	42.	Per mare, per terram;

and as worthy of high commendation the design. No. 54 – Cheddar—in Class III., which exhibits excellent features in arrangements necessary for a large-sized dairy farm.

(Signed.) Halifax Wyatt,
Thomas Sample,
J. Bailey Denton.

It is curious to remark that Mr. Sample was one of the judges at the Cardiff competition, and is evidently a gentleman with peculiar notions as to architectural competitions. Whether the commended plans are worthy of the "honour" allotted to them, is not a matter of discussion here, but, as might be expected, the award came in for some severe criticism, and it is singular to observe that although the want of economy of cost was, according to the judges' report, the competitors' stumbling point, the commended design was, with five exceptions, the most costly of any shown, being estimated at £15 7s. per acre! It would certainly be an acquisition to know where that favoured spot is situated that will afford an outlay of £6,146 for buildings alone, on a farm of 400 acres, and as a profitable investment of capital. A contemporary asserts that a commended design for a farm of 150 acres, provided stalls for twelve horses (!) and ten cows, and not one loose box,—and that while the plans of buildings suitable for a farm of 150 acres, to cost £7 16s. per acre, were commended, a similarly arranged plan on a larger scale, and by the same author for a farm of 400 acres, but to cost only £4 14s. per acre, was unnoticed! One of the judges, in his book entitled, "The Farmsteads of England," asserts that £10 per acre may often be profitably spent on the house and buildings of a farm; now deducting £2 per acre for the cost of the house, there would be £8 per acre left, as probably the maximum cost of farm buildings in any part of the country; but out of the 68 designs entered in competition more than 30 were below that amount, and at least a dozen were estimated to cost less than £5 per acre. No mention being made of economy as one of the leading features of the planning, the use of any cheaper principle of contruction than the ordinary brick or stone, or brick-and-flint walling, seems not to have been suggested in a single plan; and this is somewhat singular, considering that the walling is, as a rule, one of the most costly portions of a farmstead, and always one of the most important. And more unaccountable still is the fact that several of the designs of brick-built farmsteads were by competitors, who had for some time adopted concrete with unqualified success, and considerable saving; and had caused that material to become an important factor in the erection of farmsteads.

The conservatism shown with regard to materials of construction can only be accounted for by remembering the current rumours at the Cardiff exhibition that all concrete designs were disqualified through the judges having had no knowledge of or experience with that material, and, therefore, scarcely likely to favour its adoption. It was naturally to be expected that the award of the judges, after the immense amount of labour and outlay collectively spent on so large a collection of designs, should have been regarded by the competitors as neither more nor less than a miscarriage of justice, and the plea of want of economy regarded as absurd, because, as a correspondent, writing to the *Agricultural Gazette*, asks:—"If Messrs. Sample and Co. were judging shorthorns, I wonder whether they would disqualify the Duchesses and Oxford's because they did not combine superior quality with that economy of cost which is essential?" Moreover, the economical construction of a building should be calculated not from prices that would be unlike in any two places, and therefore mischievous and misleading, but from the plan and general arrangement of the design, the economical distribution of its various parts, and the details of construction. To take these points in—in little more than a single glance—necessitated the employment of judges not only conversant with the wants and requirements of landed property, but others whose constant practice in designing and erecting farmsteads have enabled them to quickly detect superior planning and constructive talent. It is a question if, when prizes are offered for designs of farm buildings—or, in fact, for anything else—where no saving clause is appended, and the invitation is met by a liberal response from qualified and competent persons, whether those who offered the prizes are not amenable to an action at common law for the recovery of the same. Making the present case an experiment in that direction appeared to be the view of some of the competitors, while others were in favour of an appeal to the Council; but after these considerations became public, the Society offered silver medals to the owners of the commended plans and—unfortunately for the interests of this and future competitions—the bait took, and their mouths were closed, thus preventing unanimous proceedings in any form or shape. But the Society (determined to make as much profit as possible out of the affair) required the owners of the commended plans to reproduce their designs in black for engraving in their journal, and to furnish certain particulars other than those already supplied. If the Society's journal is to be entirely enriched in this economical manner, and if the Council could only make sure, after offering the usual prizes for live stock, implements, &c., for their next annual meeting, that the competitors could be persuaded there was not a singular exhibit possessed that "combination of superior quality, with economy of cost, which is essential,"—the money loss at Kilburn might be entirely recouped; but then, possibly, their next annual show would contain "plans of farm buildings" only,—should prizes be offered,—as no other class of exhibitors would submit to be sold in that way a second time. Most of the dairy farm plans will be, it is expected, re-exhibited at the Dairy Farmers' Show, at the Agricultural Hall, in October, and it is a pity the whole of the Kilburn plans could not have been there likewise. When the "History of Competitions" comes to be written, the Royal Agricultural Society's dealings with farmstead and cottage plans, and their authors, will, no doubt, occupy a prominent share of the author's notice.

P. T.

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ROCK CONCRETE TUBES: THEIR MANUFACTURE AND USE.*

By C. Fletcher Woods.

In writing a paper upon this subject it has been the author's aim to do so as a member of this association, and he trusts that he will succeed in placing at the disposal of members that special information regarding the mode of production and the characteristic qualities of concrete in the form of sewer-pipes which he has had special opportunities of acquiring since he was engaged by Messrs. Henry Sharp, Jones, and Co. to superintend that branch of manufacture carried on at the Bourne Valley works.

As a matter of fact the process requires from beginning to end constant care and attention. In making concrete *en masse* the engineer knows well how much supervision is required. Much more so is this the case when, instead of a mass, a slight hollow tube has to be produced, which must be of great strength and without flaw. Faulty cement, dirty sand, soft aggregate, and careless manipulation are dangers to be guarded against with the utmost care, inasmuch as anything wrong may not otherwise be discovered until considerable material has been spoilt.

Sewer-pipes of concrete have been made and used in the United States for the last thirty years. Among other reports from American engineers as to their use is one speaking of their having been laid in New Bedford as early as 1845, and of their still being found in perfect condition when since met with in the course of laying water mains, and the American evidence generally is highly favourable to their use. The cementing material used in the United States has not, however, hitherto been the best that could be procured. A native production, the Rosendale cement, has been used with a small admixture only of English Portland. This has necessitated the pipes being made of abnormal thickness; for instance 9in. pipes of 1in. scantling, and 18in. pipes of 2in. scantling. The moulds first used at Bourne Valley were procured from America, and were facsimiles of the fore-going. An unwieldy article of this description would not have succeeded in England in competition with the vitreous stoneware pipes of Poole and Lambeth by reason of the weight and consequent cost of freight and handling.

In this country Mr. William Buckwell, an engineer by profession, may be considered the scientific pioneer of the manufacture, and as early as 1849 he patented a process "for the manufacture of pipes and other structures of stone," which consisted in "condensing, solidifying, and compressing such matters by subjecting them to percussion in moulds." Another quotation from his specification illustrates the position which Portland cement then held as compared with the present day. He says "the cements I use and recommend are those containing a large quantity of clay, of which the Portland is highly applicable; but I prefer cement having a larger quantity of clay and subjected to a larger amount of firing, as well as any of the limes suitable to withstand the action to which the structure is to be applied." Buckwell's principle of solidifying by percussion has not been improved upon up to the present day, but his mode of putting it into practice by means of steam-hammers, and his process generally, appears to have been too slow and complicated for it to become of practical value, and though he carried out several successful examples of his work, which still remain, it was not sufficiently appreciated, and no more was heard of it.

To Messrs. Henry Sharp, Jones, and Co. belongs the credit of having first made the manufacture of Portland cement concrete pipes a practical and commercial success in England. That firm, already engaged in the stoneware pipe manufacture, took up the question of making pipes of concrete when introduced to them by Mr. J. W. Butler, now of the East Greenwich works, and started the patented American machinery which he had brought from the States. Various troubles and difficulties of course cropped up, but they were sufficiently overcome for the process to be shown, on Mr. Butler's behalf, in successful operation to the late Mr. James Hedges, a man of great and varied experience in the use of concrete, and the establishment of another manufactory at East Greenwich followed his visit to Bourne Valley. Such has been the introduction of concrete pipes into this country. The superior strength of concrete in the form of sewer-pipes, so much above what concrete has generally been supposed capable of attaining, is primarily the result of solidifying by percussion, as projected by Buckwell, combined with a small and regular feed of material under the rammer, which part of the process he also made a point of as important.

The exceptional feature in the manufacture of rock-concrete tubes is the nature of the aggregate, viz., broken vitreous stoneware, the ordinary waste of extensive stoneware pipe-works. Mr. John Grant has pointed out as a prominent result of experiments that concrete made of broken pottery is much stronger than that made of gravel, and Table A, showing experiments made by the author on the 19th of July, 1879, for the purposes of this paper, is confirmatory; by this it will be seen that the average shows an advantage of 25 per cent. in favour of the stoneware aggregate, and it will be noticed that the lowest breaking strain of the stoneware was better than the highest of the gravel mixture. These test blocks were made in the usual course, the gravel being clean and part of a few tons got in water-bearing strata in the neighbourhood, and of similar description to Thames ballast.

The combined manufactures of stoneware pipes and rock-concrete tubes, as carried on at the Bourne Valley works, affords an excellent example of the utilisation of waste products. The stoneware is passed through a Blake stonebreaker and then under edge-runners, the fine being at each stage intercepted and returned to the pottery to be again worked up in the manufacture of stoneware, while the coarse, now reduced to the size of pea gravel, goes on to the rock concrete department. It is here mixed by machines with the other ingredients—washed sand and a fine, heavy Portland cement, specially ground from picked clinker. Thence into the automatic feed of the tube-making machine, a more powerful one than the American invention, which it has practically superseded in these works, seeing that for large tubes a heavy and regular blow is an absolute necessity, as is also a regular feed; while a hand feed, however careful, can never be so depended upon as a mechanical one, regulated by the speed of the revolving mould into which it delivers, and in which the rammer or tamper is at work. The tube is thus built up on the coil principle, as a diagram of the blows given in the course of filling the mould would indicate. A continuous and intermixed coil would appear, and it may be reasonably assumed that construction in conformity with this approved method must enhance the strength of the tube. The mould being filled, the spigot is formed by means of a heavy iron ring mould, which, under heavy blows, shapes it.

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* A paper read at the annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors, August 1st, 1879.

Great care is necessary throughout the above process. The exact proportion of water is of much importance. It is easier to make and compact the tubes when an excess of water or sand is used, but the point aimed at is to make good tubes with the least possible quantity of either. All moisture beyond that sufficient to set up the crystallisation of the cement detracts from its strength, and if in greater excess is liable to weaken it by washing out the soluble silicates. The sand partakes more of the nature of an economical distributor of the particles of cement than of an aggregate, though to some extent it is an aggregate, as it helps to fill up the interstitial spaces that would otherwise exist. Still, it does not add to the strength of the concrete—probably the reverse—the aggregate proper, broken stoneware does. Very fine sand is excluded as surrounding the particles of cement, and thereby separating them and preventing perfect cohesion, the mixing becoming granular.

The tubes as finished are placed on trucks and run out to the hardening ground, where they remain twenty-four hours in the moulds, of which they are gradually divested, the outer casing being the last to be removed. After standing on end for a week or ten days, during which time they have been constantly watered if the weather is dry, they are removed to the silicating tanks, from which, a week later, they go into stack, there to complete induration. A few words may be said as to the process of silicating and its results. Messrs. Sharp, Jones, and Co. make their own silicate bath under Righton's patent, now the property of the Victoria Stone Company, the *modus operandi* being to dissolve at a temperature of 500deg. the natural silica found in the neighbourhood of Farnham by means of caustic soda. The silicate of soda thus formed is reduced to the required dilution by the addition of hot water, 1,130 specific gravity by the hydrometer being the strength most suitable for the purpose. The silicate thus produced can be relied on as absolutely pure and of good quality. The tubes constantly absorbing the silica, the tanks have as often to be replenished so that the silica in solution may be taken as constant. A steam boiler serves to make the solution and to pump the liquid from one to another as required. As to the utility of the process, there is no doubt that it hastens very much the natural induration of Portland cement, but it does not penetrate far into the material, and the stronger it is the less it penetrates, the result being a temporary case-hardening—temporary, because it does not appear that any property is conveyed to the cement that would not eventually accrue by age. It benefits the manufacturers by enabling them to place their goods sooner in the market.

A detail of much importance, and to which great attention is paid, is the regular and continuous testing by tensile strain of the cement. Tests are first made in the usual way of each consignment of cement as it comes on the works, including the tensile test at seven days. Testing briquettes are also daily made of both cement and of the tube mixtures in which it is incorporated. All these are entered in the test-book, which records particulars of each parcel of cement, where it came from, and what becomes of it. Thus, should any defect occur in the manufacture the cause can at once be traced to its source. These numerous briquettes are all kept and tested from time to time as occasion requires—an instance of their use quite unanticipated when the briquettes were made in Table A. The author contemplated compiling an elaborate series of tables from the records of these tensile tests, but on consideration he did not think himself justified in publishing such as the results of scientific investigation, when, as a matter of fact, the testing is merely a guide, though a very valuable one, to those engaged in the manufacture, and many seeming discrepancies would arise, which, though at once to be accounted for on the spot, would be difficult and tedious to explain in a paper. The author may, however, state as a general deduction, that at the end of four months the concrete is not more than 10 per cent. below the strength of new cement, and that this difference continues with a tendency to diminish as the age of both increases. This favourable result must be, to a great extent, due to the inherent strength of the stoneware aggregate, and the capital "bite" that it affords to the matrix. It should be mentioned that the test briquettes are not silicated, the object being to arrive at the value of the concrete on its own merits.

There is, however, a record kept at Bourne Valley of another kind of testing that must have a higher practical value to engineers. This consists in submitting tubes to a crushing strain under the hydraulic ram, the breaking weight being read off the dial of a self-registering gauge. This machine is by no means in daily requisition, since the breaking of large tubes is costly and not to be undertaken without a specific object. Still, seventy-six experiments have been made in this way, some of which the author has recapitulated in tables B, C, and D. The most noteworthy are the comparative experiments made by Messrs. Welman and Creeke for purposes of investigation connected with the Bournemouth drainage. It should be added that the stoneware pipes averaged 256lb. in weight, and the rock concrete tubes 252lb.

A feature prominently demonstrated by the individual experiments, and patent also to the experimenters in all tests made, is the great toughness of rock concrete tubes.

The density and impermeability of the material is apparent to the eye, and is also demonstrated by Table E of experiments made by Mr. Henry Reid, showing absorption of moisture after ten days' immersion to average 1·7 per cent. addition by weight. The average absorption, after twenty-four hours' immersion, by stoneware and fireclay, as shown by a number of experiments given by Mr. Baldwin Latham, is 3·057 per cent.

Having described the general features of the manufacture, a few words may be said on the tubes as ready for sale, and the uses to which they may be applied. First, they are applicable to the construction of main sewers, and, without advancing for them the quality of marvellous strength it may safely be said that cetæris paribus, all experiments show them to be somewhat superior in this respect to stoneware pipes.

As regards durability, the concrete being chemically and mechanically as perfect as the finest selected cement and aggregates and modern machinery can make it, this quality follows as a matter of course. Sir John Coode, Mr. E. Druce, and others have testified to the extraordinary powers of resistance to the action of attrition and abrasion possessed by concrete, and as regards resistance to the chemical action of deleterious liquids, it would be mere waste of time to enter into argument in defence of its well-known qualities in this respect. Although at Bournemouth a sewer constructed of rock concrete tubes was found to have cracked longitudinally in consequence of the most ordinary precautions of engineering having been neglected, it does not come within the author's experience to have heard of a concrete sewer that has succumbed to fair wear and tear. Brick sewers have been thus worn out or eaten away, and the author, as a town surveyor, has had occasion to pull up many hundred feet of of fireclay pipe sewers, which although only laid for periods varying from six to seventeen years, were absolutely rotten. He was obliged to relay with others of a similar material through motives of first cost and which can only last but a very few years. At Frome, in Somersetshire, fireclay pipes have been discovered in a like condition. It is not surprising that they should be so, for fireclay, as its name implies, withstands the action of the heat, does not vitrify, and pipes made from it have only the salt glaze to protect them from the destructive effects of water, to say nothing of the more deleterious liquids they are specially intended to convey. Stoneware, on the other hand, as made in Lambeth and Poole, is the product of clays that partially vitrify under the action of intense heat, and, as Mr. Reid has shown in experiments made upon the aggregate of rock concrete tubes for the Bournemouth commissioners, may be subject to boiling hydrochloric acid without deterioration.

With the above mentioned qualities of strength and durability, rock concrete tubes become a desirable material for the construction of large sewers. In the ordinary sizes of pipe sewers they can be used as stoneware pipes are used; for the larger sized sewers they are simply invaluable as permanent cores or linings to an exterior casing or ring of coarse concrete as described by Mr. Baldwin Latham and used by Mr. Ellice-Clarke and other engineers This mode of construction is less than the cost of sound brick sewers of the same diameters, in addition to which, the perfectly concentric form and imperviousness, the saving of centering, and the possible rapidity of construction, and fitting in the trenches immediately after, show them to possess great advantages over other modes of making such sewers. As a rule, the sizes made at Bourne Valley and generally kept in stock, are from 15in. to 36in. diameter, the process of manufacture not being adapted to the economical production of small tubes, and here stoneware pipes cannot be competed with.

The joint has been objected to as too short to allow of settlement, and the same objection has been raised to the Stanford patent joint. Doubtless, such objection holds good if a rigid sewer is to be laid on a shifting bed; but when the tubes are enveloped in concrete or laid thereon, as any sewer pipe or brick should be if the ground is bad, this objection is no longer a valid one. The jointing is easily and perfectly effected with Portland cement, the material being specially adapted to it. In the 15in., 18in., 21in., and 24in. diameters, provision is made to effect a good joint round the outside; with the larger tubes there is room to make the joint inside as well as outside.

In view of using the tubes in watery ground, the author has been making experiments with a mixture of boiled tar, pitch, and plaster, whereby the water is excluded for a sufficient time for a cement joint to be made and to set *inside* the tubes, and he has attained a fair measure of success.

Mr. Ellice-Clark's experience in the use and behaviour of the rock concrete having been considerable, and he, in addition to constructing sewers with the tubes, having used them for manholes and ventilating shafts, will perhaps give his opinion on the subject. Mr. Cregeen, of Bromley, and Mr. Stow, of Frome, may also be mentioned among others as having used the tubes with success and satisfaction. Two or three wells have been constructed with them, 30in. and 36in. diameter, one being 44ft. in depth. At Bourne Valley they are used for water-tanks, and also for a hydraulic balance lift, the cylinders being 12ft. in depth by 18in. diameter.

The author hopes that these few facts which he has been able to compile relating to a new industry may be found of interest and profit to the municipal engineers and surveyors of this country.

TABLE

Showing difference in tensile strength between concrete made with washed gravel and with broken stoneware, age 5 weeks.

	lbs. per sq. in.		lbs. per sq. in.
1 pt cement.. ..	170	1 pt of cement ..	220
1 pt washed sand	169	1 pt washed sand	192
2 pt pea gravel ..	146	2 pt vitreous stoneware.. ..	220
Mean	161·6	Mean	210·6

ON SOME CHARACTERISTICS OF THE VILLAGE CHURCHES OF NORFOLK AND SUFFOLK, AND SOMERSET.[*]

By Edmund B. Ferrey.

THERE are few more interesting studies than the investigation of the different types of buildings to be found in various localities. What more natural than the fact that in each district a certain school was formed by degrees, and the architectural work produced in it thus assumed a character very unlike that of another district fifty or a hundred miles away. It is almost superfluous to say that the same thing occurs repeatedly in Continental architecture, perhaps to even a greater extent than in England, but the peculiar types there spread over a larger area of country. For in our own favoured land, the aspect and phases of the landscape very frequently alter, and one does not see those long stretches of monotonous scenery (such as greet the traveller between Paris and Dijon, or Paris and Basle) with an apparently endless procession of poplars, and, further south, the long-drawn lengths of vine after vine in the alluvial plains of North Italy. It is much the same with the architecture of England as compared, for example, with the work of French architects. We ought never to cease being thankful for this great charm of our native land, the abundant variety in the landscape (particularly in the trees) and in the buildings.

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[*] A paper written for the late Congress of the British Archæological Association, a *résumé* of which was read at Norwich.

The object in this brief paper is not so much to show forth a contrast between the buildings of one part of England compared with another, as to draw a parallel between the architecture of three counties separated by many a mile, yet in some respects bearing a resemblance. Norfolk and Suffolk have a sea-board and so has Somersetshire; the Perpendicular style, too, is largely represented in these widely separated districts. But in the latter county the earlier styles are little found, and up to the Perpendicular period the churches were not remarkable in their scale or in other particulars. The reign of Henry VII. was a great church-building era in Somersetshire. This has led sometimes to the popular belief that sculptured figures, whose identity cannot readily be made out, are representations of that monarch. And there is a remarkable subject in sculpture at the west-end of the tower to Batcombe Church, near Frome, which, being a little decayed, and not at the first glance very easy to distinguish, has been variously considered to be a figure of the Blessed Virgin or King Henry VII. ! whereas a little inspection shows it is the representation of Our Saviour Himself, a conclusion established by the emblems and surroundings. The cause of so many churches being erected in Somerset at this date is said to have been this:—That Henry VII. founded them in a style of unusual spendour in consideration of the steady support afforded him in that county in his contest with the House of York. The reason for the grandeur of the Perpendicular churches in the Eastern counties is probably, however, a different one. According to good authority, the cloth trade flourished in Norfolk and Suffolk in this period, and many wealthy merchants resided in the principal towns. Some of the grander churches were, in all probability, built by them or by guilds. Moreover, there was constant intercourse between the great Flemish cities, which were then powerful and prosperous. The distance across the German Ocean from shore to shore was not vey great.

Norfolk has the incomparable advantage over Somersetshire in possessing so many buildings of the Norman, Early English, and Decorated Style (and even Saxon). Some of them, such as Castle Rising, and a considerable portion of Norwich Cathedral, are very good examples. In Somerset Norman work is rare, and the finest specimen (in the Transition Norman style) in the county is probably that of the so-called St. Joseph of Arimathæa's Chapel, Glastonbury Abbey.

Many of the small Mediæval churches in Norfolk, unfortunately, are in ruins. The writer of Murray's Handbook to the Eastern Counties attributes this to the decrease of population, following on the decline of the cloth trade. Happily in the county I have taken as a parallel, I know scarcely a ruined parish church, for that curious fragment at Borough Bridge, near Athelney, perched on the summit of one of those remarkable mole-hill looking eminences, which rise out of the alluvial plains in the neighbourhood of Sedgmoor and Glastonbury, was a chapel dedicated to St. Michael. Yet the population in the agricultural districts of Somersetshire has decreased since the middle ages. It is likewise said that Norfolk formerly possessed many small local shrines and relics, which lost their interest after the Reformation, and so being neglected, gradually fell to pieces.

I am not saying anything very novel in alluding to the resemblance between churches of widely separated districts, as this must be patent to every intelligent observer of Mediæval architecture. But it will not be without instruction to inquire a little into the causes. Authorities differ as to whether the grand conceptions of the middle ages were designed as well as carried out by a master mason, or by a man of superior education, usually an ecclesiastic, and who could fairly be called an "architect." Mr. Wyatt Papworth, in a paper read before the Royal Institute of British Architects in 1861, says, "from a few observations recently made it has been ascertained that a series of marks are found upon buildings erected within a short distance of each other, proving the employment of the same set of workmen in each place. The Lady Chapel of Ely Cathedral and St. Stephen's Chapel, Westminster, were contemporaneous buildings, and often a reliable instance where some of the workmen were employed upon both structures." Mr. Benjamin Ferrey, F.S.A., in a paper read before the same Society, April 18th, 1864, from a different standpoint altogether, mentions the remarkable resemblance existing in the plan and other particulars between the Abbaye-aux-Hommes Caen and Canterbury Cathedral, Christchurch Priory Church and Durham Cathedral (both with Flambard's touch on them), Salisbury Cathedral and Pershore Abbey, which evidence he thinks leads to the conclusion that they were the composition of the same *architect*. Such evidence at the present time would obviously be worthless, when railways, steamers, bicycles, &c., promote intercourse between distant localities, and the general spread of information renders imitation easy. But in the middle ages, it was not so, and it may therefore naturally be concluded that marked characteristics of style and detail, at variance with the general following of the district, demonstrate the guiding spirit of the same master-hand, or—perhaps I had better say—pencil, which little brooked the difficulties of getting about from one place to another, no easy task where roads were the exception not the rule.

Of the churches in the eastern counties and those of Somersetshire no one could be rash enough to say they were designed by the same men. On the other hand, the similarities in some of the architectural details can scarcely have been the result of accident, or arise from an unconsciously parallel movement. Notwithstanding footpads, bogs and morasses, and other hindrances to intercourse between distant counties, that vigorous old-English spirit of enterprise must and did permeate those of our forefathers whose duties enabled them to travel, and hence the "similarities with a difference" now seen. To better explain my meaning, it is just such a distinction as we experience in the effect of a piece of music played from notes, and the same played by ear by one who has no other guide to follow.

Perhaps one of the first things to strike the attention of the observer in the churches of Somerset is the great variety of excellent freestones employed—the light yellow tint of the Doulting and Bath stones, turning to a mellow grey with age, the rich warm hues of the Ham Hill, or the red sandstone which prevails on a portion of the north coast near Bishop's Lydeard and Minehead. Then there is the refreshing contrast of the grey blue lias, the latter too frequently, alas, crumbling to decay. The blue lias is more generally used for the material of the main walls, with freestone dressings. But it was also extensively employed for shafts, springs, bases, and abaci in the west front of Wells Cathedral. Another stone used for the finer work was the white lias of texture almost as delicate as that of Caen. No wonder, therefore, that with such an abundant supply of materials so bountifully lavished by Nature, Somersetshire is architecturally rich in her buildings. Turning to the counties of Norfolk and Suffolk, the conformation of the land is very different to the West, and good freestone is not procurable. But flint is abundant, and to the plentifulness of this apparently unpromising and unyielding material must be attributed some of those beautiful and varied specimens of ornamental panelling (or flush work, as it is technically called) so characteristic of the churches of this district. I need scarcely say this work is entirely different from the exuberantly-moulded panel work found in Somersetshire churches, as the stone and the flint are on the same plane. It may be mentioned, in passing, that the writer in "Murray's Handbook" remarks that the ornamental features of flintwork seem to be confined to England, and may be referred to as a proof (among many others) "of the independence and originality of English architects and workmen." Although it may savour of "insular prejudice," may we not congratulate ourselves on this result? No doubt a geologist could satisfactorily account for the variety in the scenery of Somersetshire by dilating upon its physical conformities. I cannot but believe that the latter influenced the character of the architecture in different parts of the county, where we see the wild, desolate, and mountainous Mendips, the shady wooded Quantocks, the lofty Blackdown range, the hill-and-vale scenery south of Bath, and the extensive alluvial plain extending from Bridgwater to Glastonbury and Langport. In the counties of Norfolk and Suffolk there is not the same variety in the scenery; it is undulating to some extent, and is flat in parts, but there are none of those great ranges of hills which strike the eye in Somerset, and which in the plains are never sufficiently distant to altogether vanish from sight. There is not the variety in the architecture of the same period which is found in Somersetshire, though, of course, owing to the work being executed at different dates, the difference is sufficiently marked.

If the scale of the parish churches of Norfolk and Suffolk is compared with those of Somerset (the tower being excluded), it will be found that the former are more magnificent in the bodies of the structures, while the Somersetshire towers rather carry off the palm by their splendid elaboration and dimensions. I will not say but that in these two eastern counties there are such towers as those at Wymondham, King's Lynn, Cromer, and West Walton (Early English), and others which, though different from the Somerset examples, quite vie with them.

The churches in the latter county being, as a rule, of no great dimensions, and the towers lofty and large in plan, the latter attract more attention, as at St. James', Taunton (St. Mary Magdalene, Taunton, has nave and double aisles on each side of moderate height) and at Dundry, near Bristol.

The Somersetshire towers revel in the exuberance of their battlements—too much so, in some cases, as the projecting pinnacles, held on apparently by slight flying arches, look insecure and likely to come detached. In Norfolk and Suffolk the towers, in general composition, and particularly in the parapets, are less elaborate, and usually have pinnacles only to the angles, without intermediate ones. Moreover, the rich decorative panelling so common in Somerset is infrequent here, and with advantage. In Norfolk and Suffolk the angle buttresses to the towers are generally comparatively plain in design, and in plan do not greatly vary from top to bottom. In Somersetshire, on the contrary, the change of plan is frequent and ingenious, and crocketed pinnacles often occur to break the vertical lines. The fine towers of St. Peter's Church, Mancroft, at Norwich, with its four tiers of panelling, treated quite differently from the windows, and unpierced, is a good example of a legitimate phase of decorative panel-work, more skilfully managed than is generally found in Somersetshire. The grand tower of Walsoken Church, of Early English date, is a good specimen of Norfolk architecture, and a great contrast to any in Somersetshire, there being in that county scarcely an example of a fine tower of so early a period.

There is one effective feature especially characteristic of Somersetshire towers, scarcely ever seen elsewhere, except in the adjoining counties of Gloucester and Dorset. I allude to the ornamentally perforated stone louvres. There can be little doubt this feature arose not from want of good oak (for Somersetshire in the middle ages plenteously supplied that), but from the abundance and excellence of the building stones. In the Eastern counties such specimens of pierced louvres scarcely exist. The one great advantage is this: that in Somersetshire these beautiful old features to a great extent remain, whereas the original mediæval oak louvres have generally disappeared, and have been replaced by miserable makeshifts scarcely as good-looking as a Venetian blind. It would really be better (had our climate been more genial) to have had no louvres at all in many cases, and left the belfry windows quite open, like some of the French examples.

Round towers are certainly peculiar to Norfolk and Suffolk, and there are few instances of such in other counties. The reason for towers of this plan is pretty evident, as freestone quoins were not used, and so ordinary flint could well be worked in. Another recommendation, in the opinion of some, and one we know which prevailed in castles and fortifications was that such circular structures were equally strong, on every front, and therefore safer from assault than towers with square angles. In troublous times the church tower might not unfrequently have been useful as a temporary fortress. At Somerton, in Somersetshire, and its neighbourhood (as at Ilchester and Westow Bampfylde) are several examples of towers octagonal above and square at base. I have heard it said that a line of towers of this plan can be traced, from the English Channel to the Bristol Channel, across Somersetshire and Dorset. In Norfolk there are several instances of octagonal towers which differ from those in Somersetshire, as they carry the same plan from base to battlement without change. Barrington Church, near Taunton, and others, are examples of towers octagonal from the base upwards. The stair turret is more frequently made a marked feature in Somerset than in Norfolk or Suffolk.

But it is not fair to notice only the exteriors of the Somerset towers. The ground stage is often vaulted with a species of rich fan tracery having a circular opening in the centre for hoisting and lowering the bells. There is also that very characteristic tower arch consisting of two slender shafts with richly cusped panelling between them carried all round the soffits of the arch. Examples of such are numerous, and that at Evercreech Church is a very good and bold one; the same feature occurs often also in other arches to the buildings. In the *ground plan* of the churches of the three counties I am alluding to, I cannot fix upon any decided parallel or contrast.

The Norfolk Churches certainly excel in their fine clerestoies, which though of no great height are treated in a more decorative and ambitious manner than in Somersetshire, where, as a rule, they are not remarkable. What a brilliant, magnificently extended range of clerestory is that to the majestic Church of Walpole St. Peter's! Here, as in other churches, the bays in the clerestory are subdivided so as to give double the number of windows to the aisles. The motive of such designs seems to be that of an ornamentally perforated stone-wall with glass as the principal feature, but contrived in such a manner as not to offend the eye. It was here that our Perpendicular architects showed such ability, and so it was also in Domestic Tudor and Elizabethan work, where we find the same thing, although, in the latter, transoms were more extensively used. How much superior this refinement to the crude large and wide lancet windows found in Early French work (so different, too, to our refined Early English)! The finest clerestories in Norfolk and Suffolk seem to have been built in the later period of the Perpendicular style, as the arches are generally four-centred.

A few of the Somersetshire churches, such as Martock, near Yeovil, and St. Mary Magdalene, Taunton, somewhat resemble, in the manner in which the clerestory and spandrils over nave arches are connected together, the highly decorative treatment of Long Melford and Lavenham Churches, Suffolk. Here canopied niches, pilaster - like small buttresses, and panelling enrich a portion of the work, which is frequently left plain even in late and elaborate Perpendicular buildings. There is a characteristic feature to be noticed in some of the Somersetshire churches bordering on the county of Devon—the peculiar capitals to the nave arcade, late work of the fifteenth or early sixteenth century. Sculptured figures of angels, either bearing shields, or with the hands folded in prayer, are represented at each cardinal point of the capitals, the mouldings of which are generally rather meagre.

The porch, as a rule, is not, in Somersetshire, made quite such a feature of, as in the Eastern counties. The ornamentation which the Somersetshire men lavished on the bell-chamber stage and battlements of their fine towers, was here expended on the grand porches with parvise over or in the elaboration of the clerestory. The principle in both cases is defensible. It was fit, for symbolic reasons, that the entrances to God's House should be richer than the remainder of the work, and, moreover, where everyone entering could see it; and this was a usual practice in the middle ages, particularly in the Norman period.

Again, the principle on which the upper part of the Somersetshire towers was made so rich, and the lower plain is one now generally recognised.

Even in the small village churches of Norfolk and Suffolk the porch and parvise over is often very rich in design. Such examples as the Perpendicular porch to Terrington St. Clement's, with the great diagonal buttresses elaborately panelled and crocketted, or the south porch to the Church of (St. Nicholas' Chapel) King's Lynn, with its series of niches, cannot, I think, be equalled in Somersetshire.

But perhaps in the roofs there is the greatest difference. The hammer-beam roofs, whether with one or two tiers of hammer-beams are appropriately furnished with guardian angels holding either the emblems of the Crucifixion, or various musical instruments to join in the adoration of the Lamb, or, perhaps, heraldic shields—these are foremost among the glories of the architecture of the Eastern counties. The shafts with caps and bases carrying the principals, are sometimes canopied niches under the latter, and the arched wall-pieces on braces from truss to truss, all in their turn add to the majestic effect. Most of them were evidently coloured originally. The double cornices with strawberry-leaf crestings, and sometimes two tiers of angels with outspread wings are peculiarly characteristic of Norfolk and Suffolk roofs.

In Somersetshire I scarcely know any mediæval examples of hammer-beam roofs, and, as a rule, the pitch is too flat to admit of them. Instead, we find the tie-beam construction with a rather flat pitch, often very decoratively treated, as at Somerton, Queen Camel, Evercreech, Ditcheat, Bruton, and many other examples, this generally occurring where there is a clerestory. This type is found in Norfolk and Suffolk, but not to the same extent as the hammer-beam. To the less important churches of Somerset the "cradle" ceiling, lath and plastered with transverse and longitudinal ribs, having carved bosses at the intersections, is another type more frequent almost than the last named. There is another beautiful and effective, though simple kind of roof found in the county. I allude to the open trussed rafters, with semi-circular arched braces attached to each, and with moulded purlins or ribs running longitudinally, with bosses at intervals. The perspective of this kind of roof is very good, and there is depth of shadow and mystery, which cannot be obtained by a cradle ceiling, where one appears to see the whole at once. One of the most characteristic Somersetshire ceilings is that occuring to the aisles (covered externally with lead). In these instances the massive purlins and principals are richly moulded and so contrived by several orders of mouldings, that there are square compartments enriched with cuspings and carvings, &c. The churches at Bruton and Kilmersdon, near Radstock, contain excellent examples of this kind of ceiling, that at Bruton retaining some of the ancient colouring, and in itself being one of the finest specimens I know in Somersetshire. We are aware that in the middle ages this county was a wild one, full of marsh and morass, and having large forests. The latter have, to a great extent, disappeared, and hence our forefathers obtained the supply of fine oak beams, &c. In Norfolk and Suffolk also timber was abundant, and in this respect these counties appear to have changed less than Somerset.

The rood-screens and parcloses of Norfolk and Suffolk are noted, and scarcely any other counties in England have such fine examples remaining, still with the ancient painted panels. Somersetshire resembles these counties in still retaining many instances of rood-screens, though Devonshire and Cornwall excel it in that respect. Rood-lofts in Somersetshire are not so often found, but the rood-stairs sometimes are made structural features showing externally, as at Batcombe and Portishead Churches.

In the matter of carved and panelled bench-ends Somersetshire has as many good examples as Norfolk and Suffolk. Probably some of the finest brasses in England are those in St. Margaret's Church, King's Lynn. They are Flemish. It is but natural that, from their proximity to the Low Countries, the eastern counties of England should bear off the palm from the western where the brasses are not so remarkable.

But I must now pause, for the parallel might be continued *ad infinitum* through the architectural wealth of the middle ages and their noble bequests to us. Altar-tombs, monuments, sedilia, Easter sepulchres, credences, windows, doorways all might be compared. With respect to windows especially, the Flamboyant character of some of them in East Anglia, makes a general contrast with Somerset, where such a thing is a rarity. I have, however, simply attempted to give the heads of this interesting subject, time not allowing me to fully work it out.

THE GREENOCK MUNICIPAL BUILDING COMPETITION.

THE report of Mr. Charles Barry, F.S.A, on the above competition was made on the 6th ult. The following are extracts therefrom:

I place at the head of the list the design sent under the motto, "Art and Science," as I find it very much in advance in nearly all its arrangements, departmental and otherwise, of any other. I beg to advise that the two premiums of £75 each be awarded to the designs with the mottoes, "Omega," "Let Greenock Flourish."

As you have asked me to designate the 6 sets I consider the best, I add in the following order three other designs with mottoes, "Qui Dit Progres Dit Labeur," "Ciconia," "M. B."

Should the Town Council adopt my suggestions, and place the work in the hands of the author of "Art and Science," there are some points in which I think the plan may be improved, and I would also suggest some curtailment of the raised portion of the facades or quasi towers, which would, I think, detract (if so numerous as shown) from the simplicity of the sky outline and the consequent dignity of the building, while these omissions would also effect some economy.

In making the above selection I have been guided, as I have already said, primarily, by the general comparative excellence of the arrangements in planning, the accommodation given to the several departments, and the utilisation of the entire site; and secondarily, by the architectural merits of each design. To effect the first in the most complete way, it obviously follows that larger and better accommodation involves greater cube contents and consequently greater cost, and the same remark applies in due proportion to the architectural treatment of the exterior, some designs showing plain and others more ornate treatment, some having lofty bell towers or smaller projections above the parapet level to a greater degree than others, no doubt with the intention of producing a more imposing and pleasing sky-line, and a more dignified effect from a distance. These several treatments affect, of course, the estimates, and in considering these it is right to point out that increased cost means, therefore, increased advantages, while, in carrying out the work, it is of course optional with the Council to have these increased advantages or, for the sake of reducing cost, to curtail or do without them. In the instructions to architects, it is said that the cost should not exceed £80,000, though this is not made imperative, while, on the other hand, they are specially told to utilise the whole of the space available, two directions which are somewhat inconsistent one with the other. I venture to think that design is the most meritorious, which, by careful study, shows how the whole site may be utilised to the greatest advantage, and I have been largely influenced by this consideration. I subjoin approximate estimates of each of the above-named 6 designs, founded on prices for work of similar sort in Greenock, furnished to me by the Master of Works, and from local experience deemed by him to be there sufficient. They are, it is true, lower by at least 10 per cent. than the prices which, I believe, the same work would cost in London. They would range as follows, following the order of merit in which I have placed them:—

	Total Cost.	Cost of Letable Accommodation.	Nett for the Municipal purposes.
1. Art and Science ..	£88,603	£5,724	£82,879
2. Omega	64,559	8,848	55,711
3. Let Greenock Flourish	73,138	6,155	66,983
4. Qui dit Progres dit Labeur	70,446	12,653	57,793
5. Ciconia	82,912	7,544	75,368
6. M. B.	70,090	6,164	63,926

At London prices, I think the cost would be—

	Total Cost.	Cost of Letable Accommodation.	Nett for the Municipal purposes.
1. Art and Science ..	..	..	£101,168
2. Omega	..	..	75,926
3. Let Greenock Flourish	..	..	91,606
4. Qui dit Progres dit Labeur	..	..	79,560
5. Ciconia	..	..	98,773
6. M. B.	..	..	90,926

The following report from Mr. Scott, the measurer, on the probable cost of the six competitive plans has since been submitted to a meeting of the Town Council :—

Having had the reduced list of competitive plans for proposed new Municipal Buildings, Greenock—consisting of six designs under mottoes "Art and Science," "Omega," "Let Greenock Flourish," "Qui dit Progres dit Labeur," "Ciconia," and "M. B."—submitted to me, by intimation of date 9th ultimo, received from your Town Clerk, I have now the honour to report as to the comparative probable costs of same. Having carefully examined the several designs, and observed the variety of construction shown on each—such as floors and roofs, some showing them to be wholly of timber, others of concrete and iron, and these of different modes of construction, besides a great many other differences—I considered that I could only arrive at the *comparative* probable cost of each by taking the prevailing mode of construction and applying it to all. I have particularly endeavoured to interpret the drawings with regard to construction and style of finishing indicated in the various designs, and hope that I have been in no small measure successful; although these can be brought out when the architect prepares his details. The following are a few of the particulars upon which my calculations are based, viz.:—The materials in old buildings on the site are assumed to be worth their removal. The stones are rated as from Giffnock Quarries, Glasgow. The fronts to be of polished work, as shown on elevations; also the exposed parts of back walls to be faced with polished ashlar, and the openings to have plain dressings. The basement floors to be covered over with brick arching. The upper floors to be of joisting and flooring, excepting over shops and saloons, which are to be completely cut off from the buildings above by thoroughly fire-proof floors. The roofs to be all of timber and slated; the flat or platform roofs to be covered with-sheet-lead. The buildings to be finished internally in a dignified and substantial manner. The cubic space available for letting is in floors up to and including second floor. I estimate the *comparative* probable cost of the several designs at the sums marked against their respective mottoes as follows, viz :—

Art and Science	£78,679
Omega	51,241
Let Greenock Flourish	57,345
Qui dit Progres dit Labeur ..	62,480
Ciconia	67,624
M. B.	55,049

I add an abstract showing the probable cost of the various designs, in sections, as suggested by your Master of Works :—

	Art and Science	Omega.	Let Grenock Flourish	Qui dit progres dit labeur.	Ciconia.	M. B.
	£	£	£	£	£	£
Amount of Municipal Buildings, exclusive of the parts specified below	42,460	27,740	39,340	39,431	37,651	36,489
Amount of basement floor	4,621	1,962	—	1,240	—	—
Amount of space available for Letting	4,919	6,931	5,491	10,430	6,386	5,000
Amount of small towers, domes, mansards, Flying buttresses, and pediments ..	2,933	—	960	1,647	477	1,301
Amount of main or clock towers	7,000	2,500	1,500	—	2,700	—
Amount of Statuary	2,000	—	—	—	—	—
Amount of police buildings	14,746	12,108	10,554	9,732	20,410	12,266
Total	78,679	51,241	57,845	62,480	67,624	55,049

Mr. Barry, in selecting the six plans, gave the following as the probable cost of each :—

Art and Science	£88,603
Omega	64,599
Let Greenock Flourish ..	73,138
Qui dit Progres dit Labeur ..	70,445
Ciconia	82,912
M. B.	70,090

THE BRICKMASTERS OF LONDON AND THE HOME COUNTIES.

A LARGELY-ATTENDED meeting of the brickmasters of the adjacent counties who supply the metropolis with bricks, was held on Thursday week at the Hop and Malt Exchange, Borough, S.E. Mr. Alfred Wagge, managing director of the firm of Messrs. Eastwood and Co., Limited, of Belvedere-road, Lambeth, presided. The object of the meeting was to consider the retrospect of the session, so as to arrive at a computation of the loss in manufacture caused by the unparalleled deplorable weather; to discuss the state of labour for the ensuing winter and season's make; and the prospects of trade. Amongst the masters present were Mr. Charles Richardson, Vauxhall; Mr. Looker, Kingston; Mr. Stroud, Southall and Acton; Mr. Minter, Sittingbourne; Mr. L. H. Saunders, St. Helen's, Ryde, I.W.; and Mr. Loat, Clapham.

The **Chairman**, in opening the proceedings, said the meeting had not been called for any legislative purpose, but for the purpose of comparing the quantity of bricks they had produced during the past unfavourable season. It had long since been computed that 60,000,000 of bricks was the annual consumption of the London market; but in ordinary seasons, with nothing operating unseasonably against the production, the London market consumed about 70,000,000. What they wanted to know was, what the falling off had been during the past season, which was fast drawing to a close. In large brickfields, where the production had been computed at 31,000,000, there had been a diminution of 25 per cent. He believed the general opinion of the brickmakers was that there would not be so large a profit as heretofore owing to a variety of causes—the chief cause, of course, being the weather. The consequence was that he believed the diminution of production was, on the average, more than 25 per cent. below the production of an ordinary season.

Mr. **Charles Richardson**, of Vauxhall, said he could quite confirm from experience all that the chairman had stated, for last year he had 30 stools, and produced 25,000,000, and this year they had 9,000,000 less. They had 15 per cent. of shelves of "inferiors" more than during any previous season he had yet known. There had been, no doubt, great suffering experienced by the men in consequence of the amount of unworthy earth; if they could compute with tolerable accuracy the amount of bricks which they had made, they would be able to arrive at the probable supply which would be required for the season of 1881. He therefore suggested that the masters present should put down on paper their estimated production at the beginning of the season, and their actual production, now that it was nearly closed.

This having been done,

The **Chairman** said that the figures showed that the reduction was quite 25 per cent. less than for the corresponding period of last year. The minimum was a decrease of 25 per cent., and in some cases it was 43 and 44 per cent., and he had no doubt that the diminution might be fixed at 33 and 34 per cent.; and yet he might say that the make of 1878 was nothing like the make of 1877, which fell far short of the make of 1876. He thought that with the price of 32s. during the past season they had made as much money as they would at 40s. during the coming year. (Hear, hear.) He was not one of those who was in favour of forcing up prices. (Hear, hear.) It was only killing the goose that laid the golden eggs—(laughter and hear, hear.)—and in their own interest they ought to meet the interests of the builders of London, who were their best friends and customers. (Hear, hear.) Then there was another question which was, that almost one-third of the earth would be carried over until next year. He would like to hear something said about the question of labour.

Mr. **Richardson** said, the question of wages was one which ought to be considered as soon as possible after a season had finished, because agreements were entered into with the men immediately afterwards. Last March a meeting had been held at the Cannon Street Hotel in regard to the wages question, and, at that time, it was thought that the reduction in price paid to moulders should take place; but an objection was made that, with the agreements entered into with the men, nothing could then be done. His opinion was, that in the approaching season, the employers were entitled to a reduction of 6d. per thousand on the moulding, which amounted to 2s. per thousand on the actual production. In Kent and other places the wages paid to the moulders regulated the wages paid to the other employés. If they did not come to a conclusion on the subject at present they would find it impossible to do so when the season commenced. He thought there was every chance of their having a worse season next year, and that there should be reduction, he suggested.

Mr. **Loat** (Clapham) quite agreed with Mr. Richardson, that if a reduction was to be made, now was the time to do it. Last March, at a meeting held at the Cannon Street Hotel, when 70 or 80 brickmasters were present, it was thought that there should be a reduction; but the great objection to making it was, that they had then made their contracts with their men. If the masters made up their minds they could carry the reduction, and he believed the men would accept it.

The **Chairman** said, if the meeting expressed its opinion upon the subject, without binding themselves to a resolution, it would be satisfactory.

Mr. **Stroud** said he fancied that the proposal was rather premature, seeing that they were hardly in a position to forecast the future. They had admitted that not more than two-thirds of the bricks usually made in a season had been produced this, and therefore how could they reasonably predict that the coming season would be a bad one? He did not quite understand that a reduction of 6d. per thousand to the moulders would represent a reduction all round of 2s. per thousand; indeed, he thought that it would not signify more than a reduction of 1s. per thousand.

Mr. **Looker** thought that the moulders were paid out of all proportion to the price obtained for bricks. If the weather had been fine during the past season, the men would have done very well. He begged to move :—"That this meeting is of opinion that a reduction of not less than 6d. per thousand for moulding should be made."

Mr. **Loat** seconded the motion. He paid as much as 6s. 3d. and 6s. 9d. per thousand.

Mr. **Minter** thought the proposal premature. The men during the past season had had a severe time of it. The great difficulty was to get a moulder when you wanted him. (Hear, hear.) If the next season were a good one, the moulders would not take 4s. 2d., because they could command 4s. 8d. per thousand.

Mr. **Compton** said it was quite evident that they were all in the wash and not in the mill upon this subject. (Laughter.) First of all, they should have a maximum price for moulding He had been paying 5s. 8d., but you could not take 6d. off a man who was receiving only 4s. 3d (Hear, hear, and laughter.)

On a division, the proposal in favour of a reduction was carried by 23 to 7 votes.

A vote of thanks to the chairman terminated the business.

CHIPS.

The corner-stones of a new Wesleyan school-chapel were laid at Blackburn on Saturday last. The building is designed in the Gothic style, and will be built of brick, with stone dressings. Mr. Miles Aspinall, of Blackburn, is the architect, and Messrs. Higson and Sons, of Blackburn, are the builders.

With reference to a "Chip" in our last issue respecting the new east window in the Catholic Apostolic Church at Islington, Messrs. Pitman and Son, of Newgate-street, asks us to add that these windows were altogether designed, painted, and completed *by them*, on their own premises; and that though most of the glass is of foreign manufacture, some of it was bought at Messrs. Powell and Co.

The Wesleyan chapel at Elland, near Halifax, was reopened on Thursday in last week, after alterations and decoration of the organ front, orchestra, gallery, pulpit, and ceiling by Mr. Wm. Furness, of Elland; and the organ has been rebuilt and enlarged by Messrs. Connacher, of Huddersfield.

The surveyorship of Ovenden Local Board has been rendered vacant by the death of Mr. Fearnley.

The church of St. Cattwy, at Cwmcarvan, was reopened after restoration last week. Mr. Morgan, of Dingestow, was the contractor.

The pulsometer has again been awarded a silver medal (making in all two gold and five silver medals awarded to the Pulsometer Engineering Company in Europe) at the Manchester meeting of the Royal Manchester, Liverpool, and North Lancashire Agricultural Society, held 4th to 8th September.

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OUR LITHOGRAPHIC ILLUSTRATIONS.

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MEMORIAL BRASS TO THE LATE SIR GILBERT SCOTT.

We have already on several occasions alluded to the intended memorial to the late Sir Gilbert Scott, R.A., in connection with which a public meeting was held at the Chapter House of Westminster Abbey (Mr. Beresford Hope in the chair) last year, soon after Sir Gilbert's death. It was then determined to erect a memorial brass over the grave in the Abbey, and found an art teachership in conjunction with the workmen's classes of the Royal Architectural Museum, an institution of which it will be remembered that Sir Gilbert was the treasurer and founder. With regard to the brass, Mr. George Edmund Street, R.A., kindly undertook to prepare a design and superintend its execution free of charge, as his gift to the memorial, and to-day we are enabled to present our readers with a photo-lithographic reproduction of Mr. Street's drawing. The beauty and appropriate character of the design cannot but secure admiration, and the Scott Memorial Committee at once determined upon its execution, the approving consent of Sir Gilbert's family, as well as that of Dean Stanley, having been obtained. The tender of Messrs. Barkentin and Krall, of 291, Regent's-street, has been accepted for the brass, which is to be of a specially hard alloy, the engraved parts being very deeply cut, and not filled with any enamel or mastic. The tender of Messrs. Farmer and Brindley has also been accepted for the execution of the marble slab. The following is the description sent us by Mr. Street:—"The cross and border round it, the shields and inscription, are all to be brass, let into a slab of marble, which will have a carved border all round its outer edge. The inscription will be similar to that which the coffin bore. The cross has an Agnus Dei in the centre and the emblems of the four Evangelists at the ends of the arms. Sir Gilbert Scott is represented at work at the foot of the cross, and at the angles of the border will be a painter, a stonecutter, a smith, and a carpenter. The figures at the base are those of St. George and of St. Thomas, the patron of architects. One shield bears the arms of Sir Gilbert's family and the other the emblems of his trade." With regard to the Art Workman's Teachership, it has been determined, first, to obtain all the promised subscriptions not yet paid in, and then, with other sums which may be secured for the purpose, arrange a scheme to the best advantage as funds may allow. Rather more than £900 has been either subscribed or promised, and the brass monument will cost about half that sum. All those willing to help should address themselves to the hon. sec., Mr. Maurice B. Adams, at the Museum, 18, Tufton-street, Westminster.

CITY OF LONDON SCHOOL.—DESIGN "L."

Design "L" was undoubtedly one of the best submitted, and throughout the exhibition of the plans it attracted some attention, and especially was it noticed as having secured the "highly commended" ticket of the school committee. No one seemed to know the name of the author of this design, though most of the others were freely spoken off. The resemblance of the elevation to the style of the Heralds' College was observed, and the good planning of the plans was noted. Having thus secured some notoriety, we thought the design would be worthy of illustration, and, therefore, accepted the offer of the authors, Messrs. Oliver and Leeson, architects, of Newcastle-on-Tyne, to place the view and plan before our readers. The estimated cost of this design was £49,500, and the materials proposed were white Suffolk bricks for the elevation next the Royal Hotel, the remaining frontages being faced with brown Portland or Box Ground Bath stone. The roofs to be covered with Welsh green slating. The other conspicuous design, which also was "highly commended," was "Move," having a well-designed elevation, but with a better plan than architectural treatment, as we before observed when reviewing the whole series. For planning it is to be questioned whether any design submitted was more worthy of selection. Mr. S. Flint Clarkson, of Great Ormond-street, was the author.

ST. BARTHOLOMEW'S CHURCH, ARMLEY, LEEDS—NORTH-WEST VIEW.

Our illustration is taken from a drawing exhibited at the recent R.A. exhibition, and represents the new church as it will appear when the porches and west turrets are added, these features as also the large central tower being left at present unfinished for want of funds. The church is a large cruciform structure, designed in pure Yorkshire First Pointed architecture, and comprises a nave and aisles six bays long, with a large central tower and transepts, the building terminating at the east end with a seven-sided apse. The total internal length of the church is 157ft., and the height from the nave floor up to ridge of roof 73ft.; the clear width of the nave being 30ft. The outside of the building is entirely of local sandstone, while the interior is constructed and lined with Ancaster stone. The inside of the west end of the church is arcaded between the window-lights, and underneath the sill comes a richly moulded wall arcade returned on the west responds of the nave arcade. This wall arcade forms an excellent background for the costly marble font which stands at the west end, and in the centre of the nave, raised upon three steps, the lowest one being carried across the church between the responds. The central tower, apse, and aisles are vaulted, the nave and transepts having open timber tie-beam coved roofs, and the porches, when completed, will also be vaulted. Mr. Henry Walker, F.R.I.B.A., of 12 South-parade, Leeds, and Mr. Joseph Athron, of Leeds, are joint architects.

NEW GALLERY AND ORGAN CASE—ST. BARTHOLOMEW'S CHURCH, ARMLEY, LEEDS.

This organ, of sixty stops, was originally built by M. Schultze, the celebrated organ builder, of Stuttgart, for Mr. T. S. Kennedy, of Leeds, and about two years ago was purchased for St. Peter's Church, Harrogate, but being found too large for that building it has been secured for the new church of St. Bartholomew, Armley, Leeds, and is in course of erection by Messrs. Brindley and Foster, of Sheffield, who are also adding a 32ft. stop. The size of the organ has necessitated the erection of a gallery, in order to economise the floor-space. A double arcade of clustered shafts runs across, between the tower-piers, and is groined between in stone, the rest of the ceiling being coved and panelled in wood. A library is formed underneath the gallery for music, with rich traceried and panelled screen-work, and the arch at the end of the aisle is filled with an open traceried screen—while a new engine-room has been built outside the church. The organ case will be entirely new, and, together with the screenwork, is being executed in American walnut, by Mr. Wm. Pearson, of Leeds, and the stonework by Messrs. Frankland and Son, of Armley, while the blowing apparatus is under the direction of Mr. Wm. Dawes. The instrument is one of the largest and finest toned ones in the Kingdom, and it is due to the munificence of Mr. H. W. Eyres, of London, that it was secured, and at whose expense the entire works are being carried out. Mr. Henry Walker, F.R.I.B.A., and Mr. Joseph Athron, of Leeds, are joint architects.

RESIDENCE, KEMNAL-ROAD, CHISLEHURST-COMMON.

This house is now in course of erection for Mr. David J. Chattell, of 29a, Lincoln's-inn-fields, and Chislehurst, Kent, from the designs and under the superintendence of Mr. George Lethbridge, architect, of 7, Draper's-gardens, Throgmorton-avenue, E.C. The walls are of red brick, the mullions, transoms, and heads of windows of moulded Doulting stone, the cornices, plinths, &c., of moulded red brick, and the panels of carved red brick. The screen in hall and windows of porch and staircase, and upper portions of windows of drawing, dining-rooms, and library, and principal bedrooms, are glazed with stained-glass in leaded lights, the other windows being glazed with plate-glass. The roofs are covered with Broseley tiles, with red terra-cotta ridges and terminals. The hall, and the borders of the reception-rooms are laid with parqueterie. The porch and entrance-hall are to be laid with tesselated pavement. Great care has been taken in the sanitary arrangements, both as regards drainage and water supply, a separate service being provided for drinking purposes. The house contains, on the ground-floor, hall, drawing-room, and library, communicating by sliding-doors, and dining-room, lavatory, cloak-room, and w.c., servants'-hall, serving-pantry, china-closet, and usual domestic offices. In the basement, ample cellar accommodation is provided. The upper floors are approached by two staircases, the principal one being constructed of pitch-pine and polished oak, and comprise seven good bed-chambers, day and night nurseries, bath-room, and two dressing-rooms, box-room, w.c., and linen closets. The mantel-pieces are to be of polished wood. The house has been planned with the view of adding, at a future time, billiard-room, with bedrooms over, and conservatory, thus completing the original plan. The house occupies an attractive and well-timbered site, commanding extensive views. The works are now being carried out by Mr. Robert A. Lowe, builder, of No. 1, Lower Camden, Chislehurst.

THE SELECTED DESIGN FOR THE IPSWICH POST-OFFICE.

To-day we give a view, with plans, of the chosen design for the New Post-Office at Ipswich. It was selected by Mr. Charles Barry, who, on the score that none of the designs submitted could be built for the stipulated sum of the competition conditions, chose that which seemed to him to be really the best and most suitable design from an architectural point of view, the plans having been provided to the competitors. The contest really was for elevations, as the plans had already been determined upon. Mr. John Johnson is the architect, and tenders are now being obtained for the execution of the work. We have before critically remarked upon this design, when reviewing the whole set sent in at the time of the competition. The front portion of the building is devoted to post-office purposes, the rear to general offices, a portion being already let for School Board offices. In the basement are the letter-carriers and the clerks' kitchen, store-rooms, battery and linesman's rooms, and the necessary coal-cellars and heating chamber. The warming apparatus will be fixed by the post-office authorities. The plans fully explain the arrangements of upper floors. The exterior will be executed in selected Ancaster stone, and it is hoped that the figures over the portico may be executed. Electricity, Steam, Commerce, Navigation, &c., would afford symbolical subjects; statues to Sir Sir Rowland Hill and Professor Wheatstone would also be appropriate.

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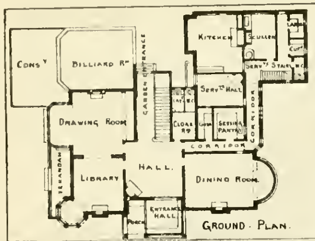
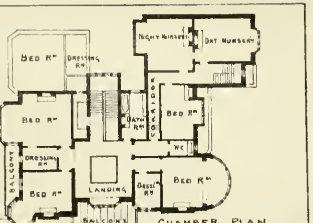
Plans for a new Congregational church and lecture-hall at Balham have been finally approved by a building committee, and the lecture-hall will be proceeded with at once.

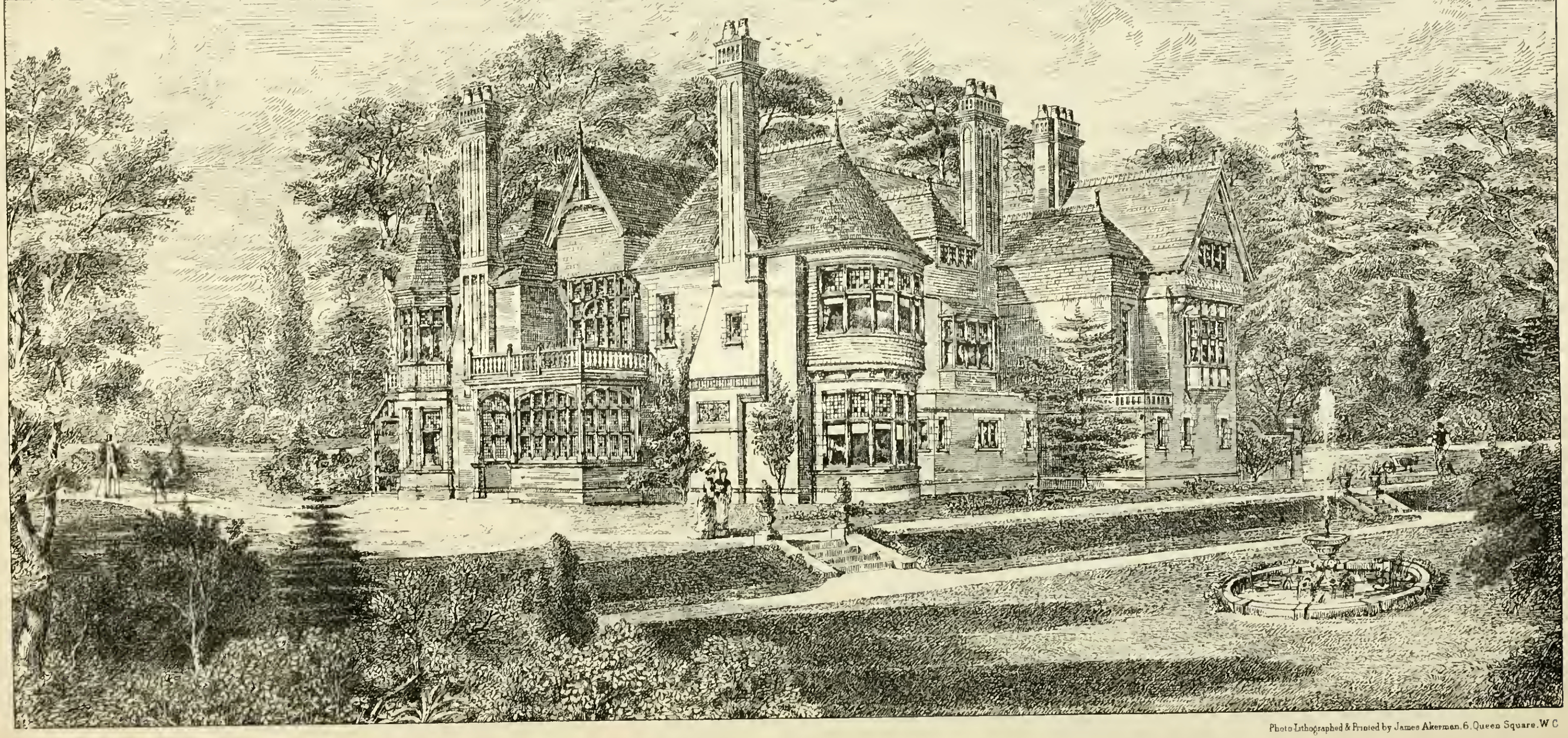
RESIDENCE, CHISLEHURST GEORGE LETHBRIDGE ARCHITECT



GROUND · PLAN.



CHAMBER PLAN



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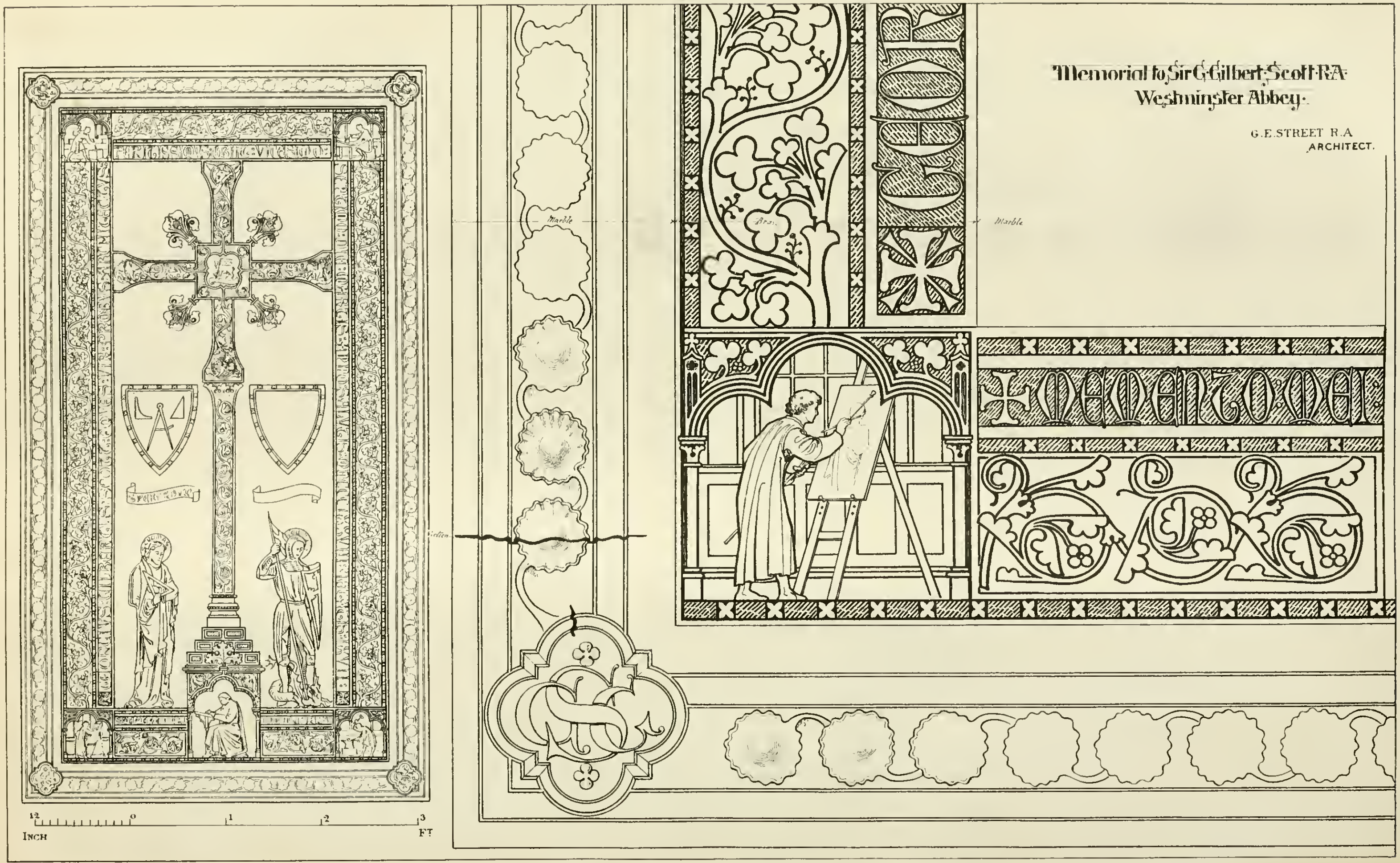

Memorial to Sir G. Gilbert Scott R.A.
Westminster Abbey.

G.E. STREET R.A
ARCHITECT.

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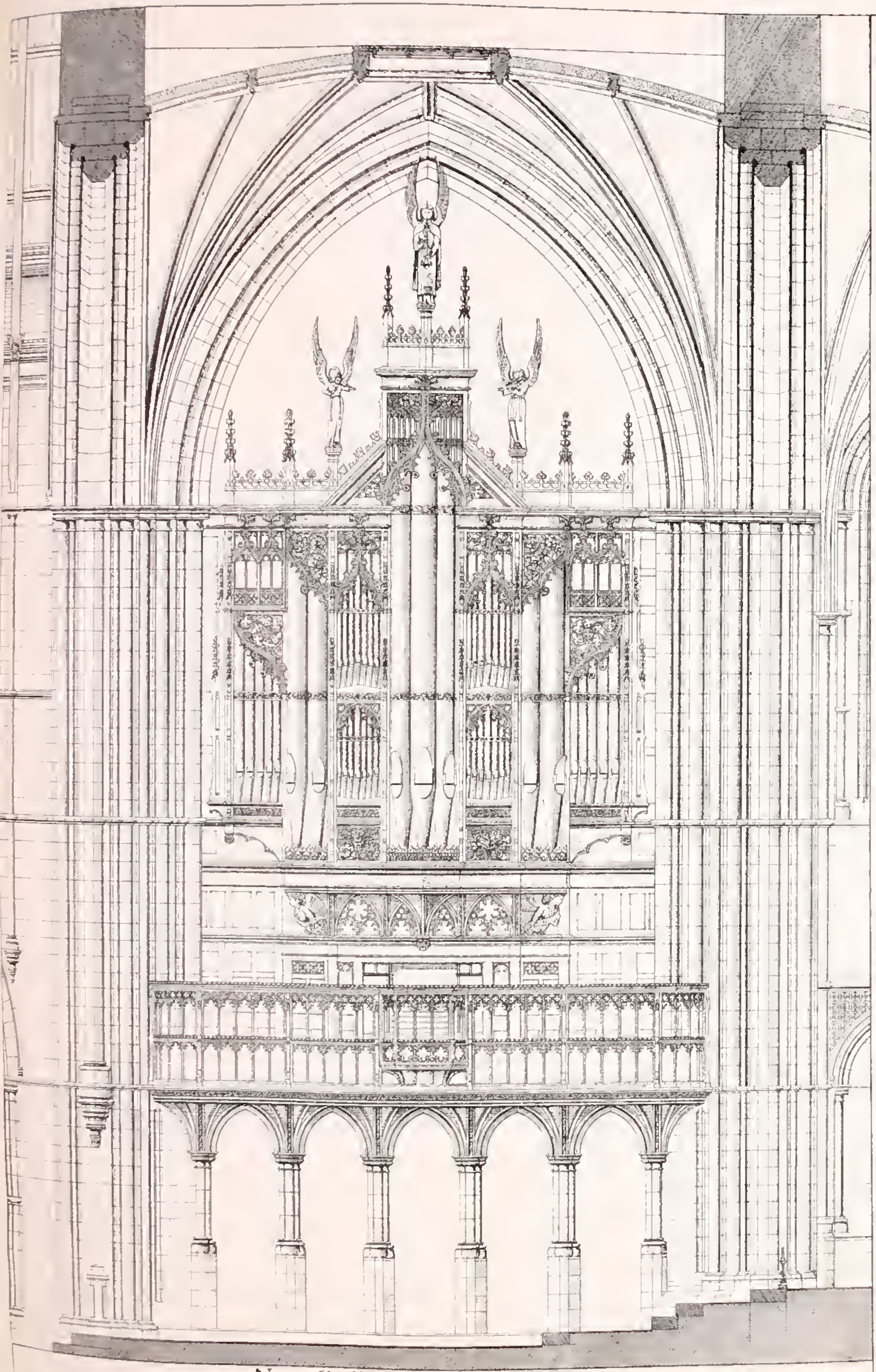
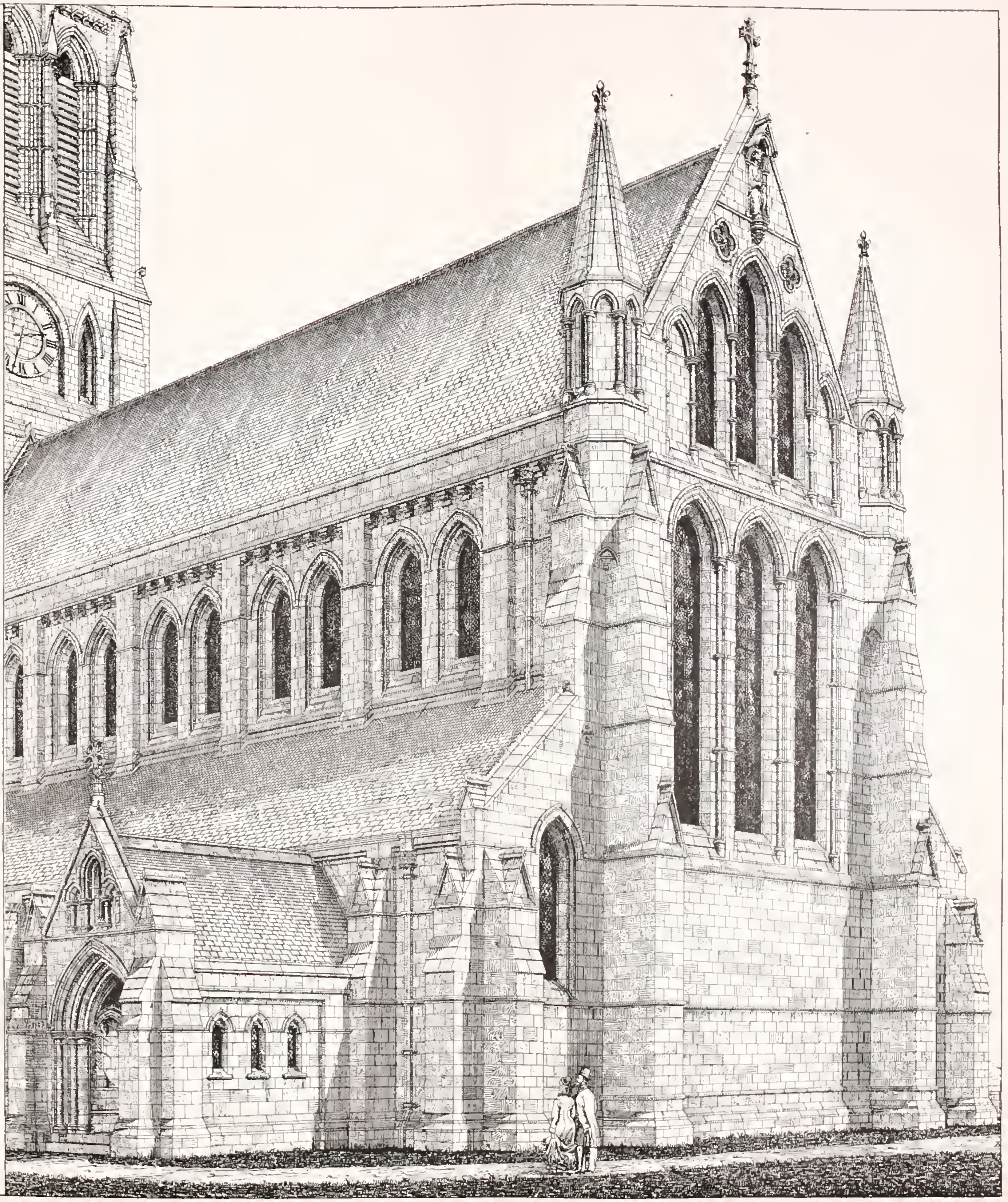


New Gallery & Organ Case.



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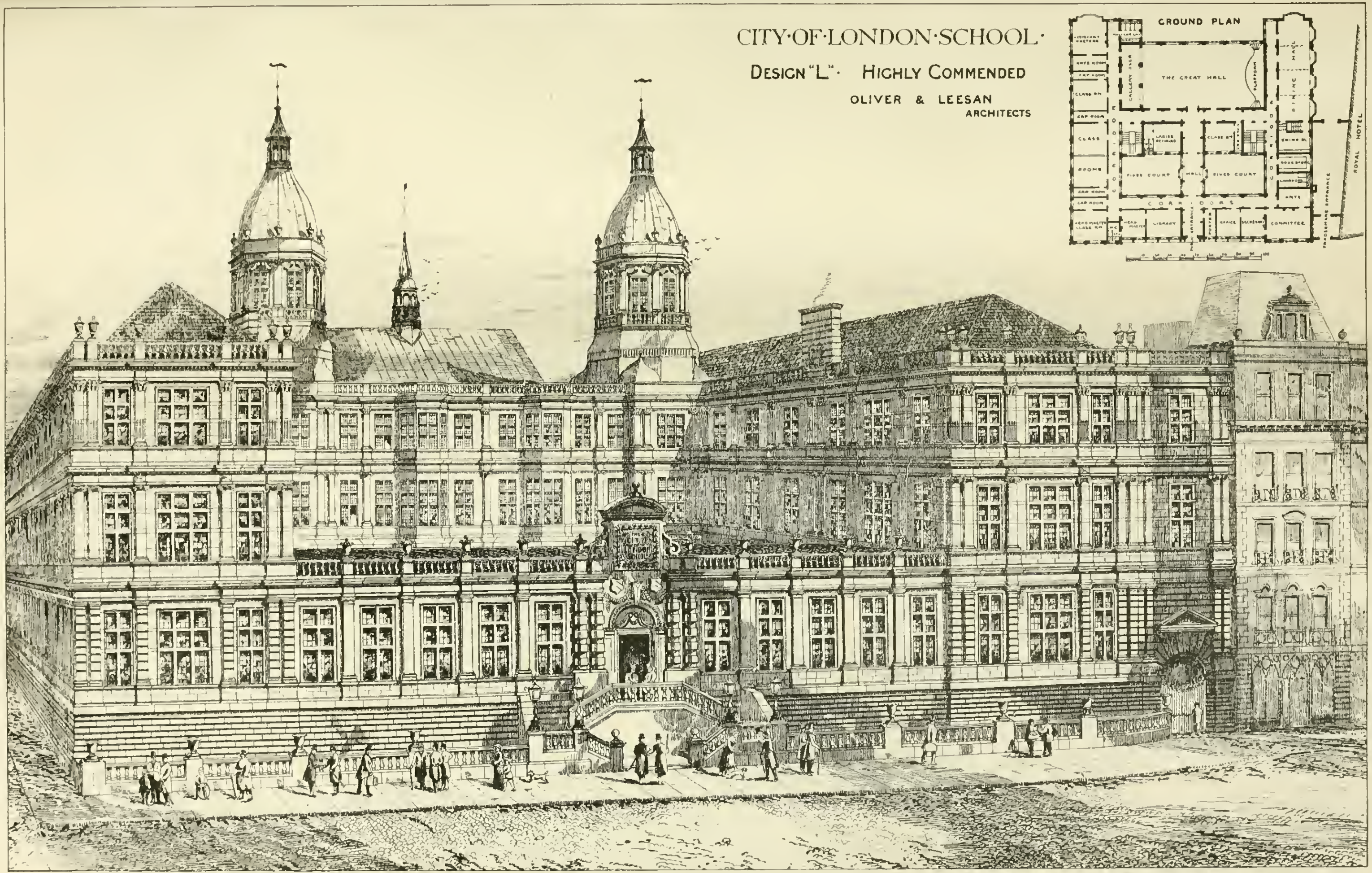
St Bartholomew's Church, Armley, Leeds.

Henry Walker } Archts.
Jos. Athron }



CITY·OF·LONDON·SCHOOL·

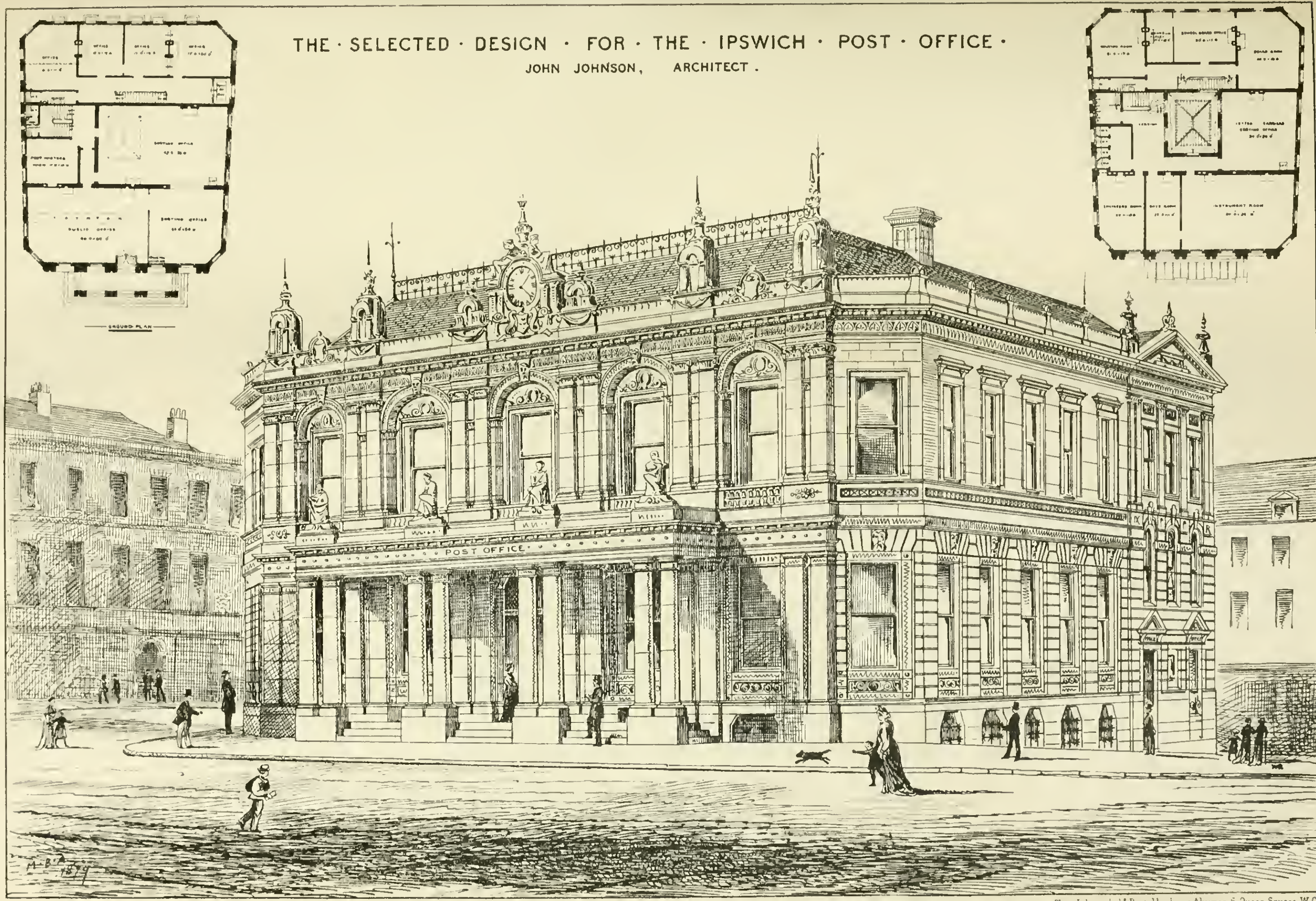
DESIGN "L"· HIGHLY COMMENDED

OLIVER & LEESAN
ARCHITECTS

Photo Lithographed & Printed by James Akerman, 6, Queen Square W.C.

THE · SELECTED · DESIGN · FOR · THE · IPSWICH · POST · OFFICE ·

JOHN JOHNSON, ARCHITECT.



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THE "BUILDING NEWS" DESIGNING CLUB.

We regret that we are unable to make our award as complete as could be wished, several competitors not having responded to our notice last week, asking them to send in their names and addresses. This however, in no way affects the prize winners, who are as follow :—

1st prize £10 10s. "S in a Circle," Walter Shaw, 37, Alfred-street, Northampton.
2nd „ £5 5s. "Motto J.," J. C. Harris, 71, Warwick-street, Eccleston-square, S.W.
3rd „ £3 3s. "Triangle in a Circle," L. Barlow, 3, Parkfield-terrace, Lancaster.

The following six competitors are highly commended :—

"Noah," Geo. W. Miller, Windsor.
"Omega."
"J'Espere," Arthur Marshall, Northampton.
"Be to its Merits, &c.," A. Broad, Croydon.
"Sunflower," Arthur H. Byrd, High Wycombe.
"Yesram," H. W. Moore, 32, Hill-street, Rutland-gate.

We depart from our practice in previous competitions by mentioning the names of six more competitors, whose efforts, though not sufficing to rank their designs with those "highly commended" above, have yet been characterised by sufficient merit to deserve some notice. Some of these have fallen off towards the end of the competition, who might otherwise have obtained a much higher position, while others, by persistent effort to the last, have maintained their place, and have, moreover, manifested signs of improvement, which ought to be sufficient reward for the pains taken.

"Mechlin," J. W. Simpson, Brighton.
"Colorado Beetle," G. S. Packer, Southport.
"East Anglian," A. L. Bradbeer, Lowestoft.
"Omnia Vincit Labor."
"Josephus Orangeblossom."
"Curiose," F. M. Risbee, 78, Abingdon-street, Northampton.

NEW BUILDINGS AT WELLINGBOROUGH.

Numerous new buildings have been erected recently at Wellingborough. In a few weeks new and commodious banks will be opened in Market-street. That of the Northamptonshire Union Bank was commenced first in February, 1877, Messrs. Green and Hull undertaking to carry out the plans of Mr. Edward Sharman, of Wellingborough, for a sum of about £4,000. Some difficulty was originally experienced owing to the treacherous foundations, but the work has since that period been carried on satisfactorily and uninterruptedly. The building is Gothic in design, rather freely treated. The façade is 45ft. long, and from the pavement to the parapet measures 38ft. The front is broken up into five bays, and there are public and private entrances and three windows in the bank. The piers are carried on tooled red Aberdeen granite bases with rubbed and moulded red Mansfield bands. The window sills are formed of tooled grey Aberdeen granite ; and the columns to the windows and doors are polished. The caps to all the columns are of Bath stone, carved and moulded, the frieze being alternate Duston and Ketton V shaped. On the top of the parapet there is a carved stone phœnix, about 6ft. wide and 5ft. high. The roof is a high-pitched one, and covered with green slates, surmounted by Macfarlane's ornamental cast-iron cresting, which is continued down the hips. The Bath stone for the parapet, cornices, strings, labels, and dressings is from the Westwood quarries, supplied by Messrs. Randall, Saunders, and Co. Various alterations and additions to the original plan have involved an increased expenditure, which will bring the total cost up to nearly £5,000. Mr. H. H. Packer has been the clerk of the works. The Northamptonshire Banking Company also began to erect new premises in June, 1877, from plans by the same architect. The contract of Mr. W. H. Henson, of Finedon, was accepted for the work, which he has carried out at a total cost of nearly £6,000. The façade is about 50ft. high and 47ft. long. The bases are formed of Aberdeen grey granite, immediately above being a heavy-moulded sill course in Derbyshire stone. The piers—which support caps of Bath stone—are of red Mansfield. The window heads and corbel stones throughout are executed in red Ketton. The general facework of the bank is of Derbyshire stone, relieved with jambs, arches, and string-course of Bath. The strong door and safe are by Chubb and Son. There is a similar strong room in the basement fitted up in like manner. The whole of the stone carving was executed by Mr. H. Hems, of Exeter, and the wood-carving by Mr. Barrfield, of Leicester.

A new office has been erected by the Gas Company, in Cheese-lane. It is in the Elizabethan style, and was built from the designs of Mr. Edward Sharman by Messrs. Harris and Morris, of Wellingborough, at a cost of about £1,500 or £1,600.—The work in connection with the new Second Grade Grammar School, at Wellingborough, has also been commenced. Mr. W. Talbot Brown is the architect, and Mr. John Watkin, of Northampton, the builder, the contract being just over £4,500. In length the building will measure 115ft., and in height about 40ft.—The new Company Coffee-house, in Queen-street, is now well nigh complete. There is a large room on the ground floor 40ft. by 20ft., and an apartment above of the same dimensions for billiards and other amusements. Mr. Henson, of Finedon, is building it, in accordance with the instructions of Mr. Brown. A villa in the Queen Anne style has also been erected in Hatton Park for Mr. B. Brown. The design is by that gentleman's son, Mr. W. Talbot Brown; Mr. J. Beddington, of Wellingborough, being the builder.—The same architect is putting up a new and handsome villa in Queen-street, for Mr. E. Blott.—A large billiard-room is also being erected in connection with the most important Wellingborough hotel, "The Hind" ; and the front of the building is also undergoing restoration, under the superintendence of Mr. E. Sharman.

THE QUEENSTOWN DEEP WATER QUAY.

The commencement of an important engineering work was made at Queenstown last week, by lowering into position the first concrete block of the new deep-water quay. The quay will be 600 feet long, and 40ft. wide, and the estimated cost of constructing it is £30,000. The floating sheers, with the machinery for lifting the concrete blocks was supplied to the contractor for the building of the quay—Mr. J. Delany, of Cork—by Messrs Charles Powis, Carter, and Morris, of Millwall Pier, London. The hull is 100 feet long, 32 feet wide, 9 feet 10 inches deep fore, and 13 feet 10 inches aft. The sheer legs are fixed at the fore end, together with a pair of powerful pulley blocks and chains for raising and lowering the massive blocks of concrete, about 140 of which will be altogether required, and which are rectangular, being 20 feet in depth 8 feet in thickness, and of 12 feet frontage each, weighing close on 120 tons. At the after end of the hull is constructed six water tanks capable of holding 150 tons of water, to act as a counterbalance to the block. To these tanks, a centrifugal pump is connected, so that they can be filled when raising the block, and emptied when lowering it, and by this means the hull can, at all times, be kept on an even keel. The machinery consists of a locomotive boiler, and a pair of eight horse-power horizontal engines, connected by gearing to two drums, each seven feet long by four feet diameter, and string chains pass over two powerful pulley blocks, which are attached to the upper part of the sheer legs, the lower pulley blocks being fitted to massive forged beams, the ends of which are slotted out to receive the lifting bars, and by this means the huge block is suspended from four points and kept perfectly level. The engines drive a pair of screw propellers, which considerably assist in working the sheers into position.

WELL AND RIVER WATER.

In Dr. Wallace's lectures on water supply, published under the auspices of the Lord Provost, magistrates, and Council of the City of Glasgow, a few facts are brought forward respecting springs and wells that possess some interest to the sanitarian. In speaking of London, he refers to the abundance of water found in the greensand strata, which can be procured by boring through the chalk, and that is used by the London brewers. There is a popular notion, he says, "that London stout is made with Thames water, but it is not, and never has been, and is never likely to be so long as water from the springs can be had in sufficient quantity." Deep wells do not necessarily give pure water, even if surface-drainage is excluded from them. He shows that sewage matter infiltrates into the wells without undergoing oxidation, giving rise to enteric fever. Dr. Wallace observes that of the many hundreds of well waters he has analysed, fully a half have been contaminated with sewage to such an extent as to render it extremely doubtful whether they should be used at all. These waters are generally colourless, bright, and cool ; hence their danger to the unsuspecting. The author observes, with some force and irony, "it is not therefore surprising that country folks, who probably have used such water all their lives, and whose systems have become habituated to the nitrates, sulphates, chlorides, and saline matters held in solution, should be unwilling to give up the use of their wells, especially when they are called upon to pay for a supply by gravitation. It is therefore necessary for the local authority of a village or country district, to use sharp coercive measures, and to peremptorily close such wells as are certified to be dangerous to health." As regards running water, the author observes that, however polluted by sewage, it is not likely to generate or propagate disease, nor sensibly affect the salubrity of the district. We have ample proof afforded, both from experience and the reports of sanitary inspections, that the well, as a source of supply, must always be open to suspicion of the gravest character, especially in town districts. In the country they are open to various kinds of accidental contamination, surface as well as underground. Our broad flowing streams and rivers are not exempt from the same sources of pollution, but they are to a large extent self-purifying ; hence the value of a river source when duly protected.

THE DECAY OF GRANITE.

A correspondence on the alleged unsuitability of granite has appeared in the *Times*, one writer fearing that the decomposition of the felspar in the granite by atmospheric action renders that material unfit for use in the new Eddystone lighthouse. In our opinion—confirmed, we notice, by Mr. J. L. Cherry, F.G.S.—this is an error. Mr. Cherry remarks : —"The conditions under which felspar decomposes into china clay are altogether different from those under which granite buildings and monuments exist. It may, I believe, be stated with confidence that never has the felspar in a granite building been decomposed by atmospheric action. Cleopatra's Needle has been slightly worn by time, but there is no trace of decomposition in its abounding felspar. Any one who has examined the porphyritic granite of the Land's End will remember that the crystals of felspar are less acted upon by air and water than the other constituents. London readers may see a granite of this kind in the obelisk at the bottom of Fleet-street. The fear of the decay of the granite of Eddystone Lighthouse is quite chimerical."

The most interesting contribution to the controversy is the following letter from Messrs. John Freeman and Son, the well-known owners of the great granite quarries at Penrhyn :—

"Granite is found in a defective state in the following circumstances :—(1) Where the rock lies at the edge of the granite formation, and is in close proximity to the adjoining stratum, and when in such position it is much disordered by metallic veins ; and (2) when found on the surface where the crystallisation of the rock has never been perfectly completed. It must not at all be inferred that all granite found under the above conditions is defective ; but, as far as our observation goes, any defect in quality is invariably referable to one of them. As a general rule, the granite which lies at the edge of the formation, and which is in contact with the next stratum, is more or less disordered ; but it is frequently quite as hard as, if not harder than, in the centre of the formation. Much granite is also found above the surface as perfect in its structure and colour as any quarry stone. We have at Kilmar, near our Cheesewring quarries, a very marked example, where for upwards of a mile in length the rocks rise from 100ft. to 250ft. in height, and range from 10 to several hundred tons in weight, the quality being as fine and the crystallisation as perfect as in any quarry. In this case it would appear that some upheaval has occurred, which has exposed the deeper beds of rock, and Nature for once kindly has done a good deal of quarrying for us. The granite which was used in the construction of Waterloo-bridge was evidently obtained from the loose boulders which were found on Dartmoor and Cornwall at a time when quarrying was not even in its infancy. Much of it is perhaps about as bad as could possibly be found, and is in marked contrast with that which has been used in the Thames Embankment from the same districts. We have heard that when the late eminent civil engineer, Mr. Walker, was conferring with the great Duke of Wellington on the employment of granite for the Admiralty Pier at Dover, his Grace asked him which he thought the more durable—the Cornish or the Scotch. His reply was that the Cornish would probably last for ever, and the Scotch, it might be, a little longer, but that the Cornish could be obtained in much larger quantities and sizes than the Scotch, and at much less price. His reply was, 'Well, if it will last for ever, I think it is quite good enough for Dover Pier.' "

HANWELL SEWAGE DISPOSAL.

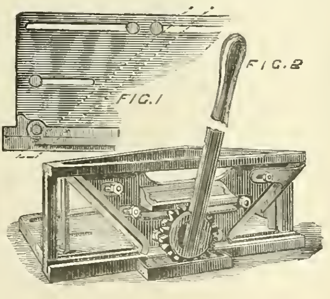
AFTER three inquiries by officers of the Local Government Board, and more than the usual amount of delay and difficulty in determining how to dispose of their sewage, the Brentford Rural Sanitary Authority decided some six weeks ago to invite engineers to send in competitive schemes for the sewering of Hanwell, and for dealing with the sewage-water at the outfall. The River Thames Conservators have, it appears, served the Brentford Board with a notice to discontinue the pollution of the Brent with the Hanwell sewage, and this is only the first of a series of attacks likely to follow on the smaller towns in the Thames Valley. In response to an advertisement setting forth their desire to be furnished with plans on or before September 2nd, no less than twenty engineers have sent in schemes. As one gentleman has prepared three alternative designs, and another firm two, the Rural Sanitary Authority have twenty-three plans before them. The information vouchsafed to intending competitors was so scanty that it may almost be set down as having been *nil*. Indeed, for all the chief particulars they were referred to an article in the *Sanitary Record*, which was evidently written by a strong partisan of an engineer whose plans for a previous scheme had been rather roughly handled by the Local Government Board. The article in question was in certain particulars based upon erroneous information, and was certainly calculated to mislead. The following is a list compiled from the *Middlesex County Times* of Saturday last, giving the names of the competitors and the amount of their estimates:—

	Name.	Estimate.
		£
S	F. Totness	14,154*
N	T. Hennell	12,800†
S	W. F. Rowell	12,000**
S	G. A. Lundie, I.	10,891
N	"Sanatas"	10,000
N	R. W. P. Birch and G. W. Wilcocks	10,000
S	Scott and Redgrave	9,506**
S	Hutton and Hutchins	9,480
N	Monson	9,300
N	Lundie, II.	8,945
N	J. H. Swan	8,231
N	"Phi"	8,115, 16s.
S	Lundie, III.	7,836
N	H. O. Smith	7,716
S	Russ and Minns	7,652
N	Grindle	7,094
S	Gotto and Beesley	7,000
S	G. Remington	6,900
S	S. and Ellice Clark	6,812
S	"Esca"	6,315
S	Donaldson and Davenhill, I.	6,049
S	Ditto, II.	5,955
N	E. Dudley	5,594

It will be observed that 13 names are prefixed with the letter S, while 10 names are preceded by an N. This is to signify that 13 engineers take the sewage to the southward of the town, and 10 have selected land for the treatment of the sewage to the north, which can only properly be commanded by means of pumping. It is somewhat difficult to determine the reason which can have induced so many of the competitors to declare for an outfall to the north, contrary to the general inclination of the land, and to the natural drainage of the Brent. The principal cause may, perhaps, be an entirely groundless assertion in the article which was made the mode of conveying instructions to competitors that land could only be obtained to the southward at a ruinous cost; or it may have been due to the avowed preference of several members of the Board for a northern site for the sewage works. The land to the northward of Hanwell is mainly stiff clay, and two Local Government inspectors have pointed out the undoubted superiority for irrigation purposes of certain land to the southward of the town, which can be commanded by gravitation. Whatever plan may be selected for the first and second premiums, a condition of the competition is that the award of the first premium is to carry with it the execution of the work, subject to the sanction of the Local Government Board being granted; and in view of the great diversity of opinion which appears to prevail respecting the rival sites, it would certainly be advisable that the Hanwell authorities should obtain the assistance of a professional man to adjudicate the premiums. They have made too many serious blunders already in dealing with this question, and it is quite time that the Hanwell sewage works were completed.

A NEW MITRE-CUTTER.

THE accompanying engraving represents an improved mitre-cutter recently patented by Mr. W. R. Fox, of Rockfall, Conn. Its construction is so simple that it can be readily understood by a glance at the engraving, Fig. 1. The cutters, which are made of the finest cast-steel, are secured to a slide that moves in guides along one edge of the bed, and the slide is moved by a pinion placed between the rack on its outer side and a rack on the bed, the pinion being provided with a long lever by which cutters may be moved in either direction with force sufficient for any work that the tool is capable of doing. Upon the bed, Fig. 2, there are gauges and guide-marks to which the work is adjusted. At each end of the bed and near the path of the knife there is a pivoted support for the end of the piece being squared.



The tool seems superior to the block plane, says the *Scientific American*, as it will do the work quicker and better. It is particularly useful in squaring across the end of the grain; when used for this purpose, the piece being cut may be backed up by another piece to prevent slivering. The tool is strong and well-designed, and well calculated to meet the wants of woodworkers.

ARBITRATIONS.*

ARCHITECTS and surveyors are frequently called upon to act in the capacity of arbitrators, and it is, therefore, of some importance that the power and duties of that function should be clearly understood. A treatise of compendious form has just been published, written by Mr. Charles Jackson, building surveyor and arbitrator, in which the duties of arbitrator are concisely explained and the principles of the law of evidence stated. That such a treatise was wanted may be inferred from the number of questions constantly coming to us from the younger members of the profession upon the rules necessary to be observed. Mr. Jackson has apparently studied and sifted some of the best authorities on the law of arbitration, and has presented the results of his reading with the additional advantage derived from a professional experience. The first part treats of the duty of the arbitrator, of which it would be unnecessary to say anything here. We may mention, however, that frequently the parties to a disagreement appoint each their own arbitrator, in which case the arbitrators consider themselves agents or advocates of their clients. The author observes, "Where two arbitrators are chosen, one by each party, they frequently consider themselves the agent or advocate of the parties appointing them—a notion which ought strongly to be repudiated, as each arbitrator has the same obligations upon him as if he were the sole arbitrator; and as they frequently are unable to agree, and have to leave the decision of matters to an umpire, it, therefore, practically amounts to the appointment of a single arbitrator." In matters of dispute arising in building operations between lessor and lessee, or outgoing and incoming tenant, it is generally the custom for each party to appoint his own arbitrator to settle the difference between them, but in many instances the decision of the matter has to be referred by a previous arrangement to a third party or an umpire, who then really performs the work of the arbitrator; and much expense and circumlocution might be saved by both parties at the onset agreeing to the selection of one competent and disinterested individual. The general powers and duties of the arbitrator are defined with clearness. He should ascertain the powers imposed upon him by the "submission," or document left with him, conferring the power. These vary according to the reference and to the "condition precedent," such as that under the Lands and Railways Clauses Acts, 1845. It is a condition precedent, for example, that before two arbitrators proceed they shall appoint an umpire. The arbitrator has the appointment of the time and place of meeting, which he can revoke within reasonable limits. He is supposed to be incorrupt and impartial, and may be liable to an action if he is proved otherwise; he must hear the statements of both sides with judicial fairness, and be careful not to take statements behind the back of the other party. The acceptance of hospitality of either is certainly a very objectionable and imprudent conduct, and *ex parte* proceedings should be strictly avoided. An arbitrator is considered "to be judge of both law and fact," says the author, though we are disposed to think that observance of facts, and keen deduction, would be more desirable functions for him to possess. It may be mentioned that the arbitrator can proceed with the reference even if one party neglects to attend; and he has power to call for documents in the possession of either party. In arbitrations upon builder's work the arbitrator is not bound to view the premises, and it is entirely discretionary with him. In the section treating on "witnesses" we have a few rules of importance: such, for instance, that each party, as a rule, is entitled to be present at the examination of the other party's witnesses; and that it is imprudent for an arbitrator to take the examination of any witness behind the back of the opposite side. Sections on "Oath," "Duties as to Evidence," are important. The order of reference leaves it optional to the arbitrator whether he swear the witnesses on oath. The appointment of umpire is discussed. Both arbitrators must agree on the appointment, and he must be an umpire between the parties to the reference, and not between the arbitrators. His appointment must be by choice, not chance. We know it is sometimes customary to select a gentleman by tossing, or other mode of chance, but this is improper, unless the parties assent to the appointment in such a way. An umpire has the same powers and duties as the arbitrators; he should examine witnesses himself, and deal with the matter as if it were the commencement of the proceedings; sometimes, however, to save time, he sits along with the arbitrators in the first instance. It is necessary for the arbitrator to announce to both parties when he considers the case closed, so that he may proceed to make his award. It is equally necessary, however, that the case be not closed too hastily, or without giving either party due notice of intention; and the arbitrator has power to reopen the case, and receive further evidence, on the application of either party, or without it. Section X. deals with costs. The arbitrator has often, by the terms of submission, to determine the costs. As to his own fee, he should not name the amount of it in the award, but simply direct which party is to pay the costs of the award, and he should not give up his award till his fee is paid, the amount of which he usually informs the parties of previously. Various other important rules and directions are given in subsequent chapters of Mr. Jackson's treatise, touching on "Awards," "Referring back Award to Arbitrator," "Rights and Liabilities of Arbitrator," &c. The forms of appointment, notices, &c., are useful also. Part the Second deals with the law of evidence. Three rules are necessary to be kept in view. These are stated to be by Roscoe. 1. That the evidence be confined to the issue; 2. That the substance of the issue only need be proved; 3. That the burden of proof lies on the party asserting an affirmative fact, if it be unsupported by any presumption of law. The chapters on primary and secondary evidence, admissions, documentary evidence, contracts and their subject matter, illegal contracts, &c., will be found of great service to the student in this branch of his profession. Mr. Jackson's treatise has a very copious and complete index, and the marginal headings to the various sections render the work extremely convenient for reference. We can heartily recommend it as a very necessary handbook for the use of lay arbitrators.

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* Includes 20 acres of land. † Includes £3,000 for land ** Includes land.

* The Practical Arbitrator; being a Treatise for the Use of Lay Arbitrators, &c. By Charles Jackson, Building Surveyor and Arbitrator. London: Knight and Co.

A VISIT TO THE GREAT WALL OF CHINA.

The Great Wall of China is described in a letter to the *New York Herald* by one of those who visited the shore end of this stupendous mural barrier in company with ex-President Grant and party, in June last. He explains that the General was informed that the Great Wall came to an end "somewhere on the coast on our way to Chefoo," and it was therefore decided, although the coast has been only roughly surveyed, the *Richmond* should steam slowly along the shores of Northern China, groping for the Wall. About 2 p.m., one day, Lieut. S. Perry, the navigator, found the Wall. By careful looking through the glasses, the correspondent adds, in time we saw it—a thick, brown, irregular line, that crumbles into the sea. The steamer was anchored, and as many as could be spared went ashore, including a sailor with a pot of white paint to inscribe the fact that the *Richmond* had visited the Great Wall. The Great Wall, the correspondent apologetically explains, is the only monument I have seen which could be improved by modern sacrilege, and which could be painted over and plastered without compunctions of conscience. It was built by a Chinese emperor two centuries before Christ to keep the Tartars out of his land, and so well was it done that here we come, 20 centuries after, and find it a substantial, imposing, but, in the light of modern science, a useless wall. It is only when you consider that it is 1,250 miles long, and the incredible amount of labour it imposed, that the magnitude of the work breaks upon you. The end of the Wall, which juts into the sea, has been beaten by the waves into a rugged, shapeless condition. There is an easy ascent up stone steps, and at the top is a small temple, evidently given to pious uses still, and with clean and painted walls. The Wall at this point is from 75ft. to 100ft. wide, but this is merely to accommodate the temple, for the average width at the surface is from 20ft. to 25ft., and at the base it varies from 40ft. to 100ft. It is made of stone and brick, and considering that a score centuries have tested its workmanship, the work was well done. As a mere wall, there is nothing imposing about the Great Wall of China. There are a hundred thousand walls the world over better built and more useful. What impresses one is the infinite patience which could have compassed so vast a labour. The late Mr. Seward calculated that the labour which built it would have constructed the Pacific Railway. General Grant thought that Mr. Seward had under-rated its extent. "I believe," he said, "that the labour expended on this wall would have built every railroad in the United States, every canal and highway, and most, if not all, of our cities." The story is that millions worked on it, and that the task occupied ten years. The correspondent remarks that he ceased to wonder at such an assertion after seeing what Chinamen can achieve when allowed their own way.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Fortingall, N.B.—A tumulus on the north-west side of the Roman camp at Fortingall, on the estate of Mr. Garden Campbell, was opened last week by a committee of Scottish antiquaries. The mound is nearly 60ft. in length, 18ft. broad, and about 7ft. high. It has been supposed to mark the burial-place of those who fell in the battle which Agricola fought here with the Caledonians. Many interesting Roman remains have been found from time to time within the site of the camp (which occupies an area of 30 acres), including a standard, the shaft of which incloses a fine-fluted spear; these are now preserved at Troup-house. In the prætorium of the camp was found a vase of mixed metal in shape resembling a coffee-pot; and a number of urns and flint arrow-heads have been picked up in and around the camp. The ramparts, although chiefly levelled, can still be traced; the prætorium is remarkably complete, and also the deep fosse surrounding the head-quarters, but the outer trench has been chiefly filled in.

COMPETITIONS.

Newark Hospital Competition.—On p. 294, in the list of plans received for Newark Hospital, we omitted to mention the names of Messrs. Freeman and Naylor, of Derby, as competitors. These gentlemen, we are informed, sent in two designs. We also further learn that the number of competitors from whom plans have been received is seven, and not five, as stated by us last week.

CHIPS.

At the last meeting of the Guildford Town Council, some remarks were made on the abstention of the local builders from tendering for several road-repair contracts. Mr. Swayne said, that it could be explained; if the council choose to accept tenders from gentlemen outside the borough as they had done, the local builders had made up their minds not to tender at all. Several members protested against such a remark being made by a member of the council, and Mr. Swayne explained that the grievance was, that when a local man, Mr. Patrick, retreated from his tender, the council did not take the next lowest, but called for new tenders, when strangers, Messrs. Martin, Wells & Co., were successful. In the present cases this firm was the only one who made offers, and their tenders of £190 for repairing Churchill-road, and £170 for repairing West-road, were accepted, the Mayor remarking that the local builders were but cutting off their noses to spite their faces, and had placed themselves in a false position.

With reference to the advertisement in our pages last week, announcing the public distribution of the gold medal and prizes to the students of the school of art in connection with the Royal Architectural Museum, on Monday next, at 18, Tufton-street, S.W., we have been requested to state that Canon Duckworth will take the chair, and distribute the prizes, in the place of Mr. J. P. Seddon, who has to be out of town. We trust there will be a good meeting.

Three sets of plans have been received by the Maesty local board for the proposed new market-house and town hall. All are considered by the board too elaborate and costly to be in harmony with other buildings in the town, or its requirements.

A long discussion took place at Monday's meeting of the town council of Leamington, relative to the expenses of the new waterworks, which have amounted to some £10,000 for erection.

The Wesleyan chapel in George-street, Limerick, was reopened on Sunday after renovation, under the supervision of Mr. Fogerty, C.E. The cost has been £670.

A series of public baths and wash-houses have just been erected on St. Peter's-hill, Belfast, for the corporation of that town, at a cost of £2,215.

Park Chapel, Halifax, was reopened on Sunday, having been decorated in colour by Mr. Gledhill, painter, of Gibbet-street, Halifax.

Building Intelligence.

Abergele.—The memorial stones of a new Wesleyan Chapel were laid at the junction of St. George's-road and Bridge-street, Abergele, a fortnight since. The chapel measures 54ft. by 45ft., and will have a continuous gallery on three sides, the total number of seats being 600. At the rear, forming the arms of a T, are schoolroom for 250 children, class-rooms, boiler-room, and offices. The style is Classical, the front being of the Doric order, and the materials used are limestone and Ruabon freestone, the roof being covered with Bangor slates. The ceiling will be coved and moulded with plaster ribs. The internal woodwork will be of selected pitchpine. The warming will be by hot air. Mr. Richard Daines, of Bangor, is the architect, and the contract has been undertaken by Mr. J. Copping, of Abergele, at £2,500.

Bath and Wells Diocesan Societies.—The following grants have been made by these societies in aid of church restoration and extension:—St. Nicholas, Radstock, towards rebuilding, £120, estimated expense, £2,400, additional seats to be gained 100; St. Mary, Holford, restoring and reseating, £25, expense £350, seats, 12; St. John the Baptist, Churchill, restoring and reseating, £50, expense, £1,672, seats, 16; St. Andrew, Rowbarton, Taunton, erection £300, expense, £3,625, total seats, 597; St. Mary Magdalen, Upton Noble, general restoration, £10; Blagdon Hamlet, erection of mission-room £15. To the Incorporated Church Building Society, £125 13s. 3d. was voted.

Blackley.—A new Baptist Chapel at Blackley, near Halifax, was opened on Wednesday week. The chapel is Corinthian in style, and has six columns of that order on the chief front, supporting a cornice and pediment. The building is of stone from neighbouring quarries. The interior measurement is 46ft. by 44ft. A gallery supported on iron columns and girders surrounds the interior. The pewing is arranged on the circular plan, and, together with all other woodwork, is of pitchpine. A space for an organ is left in the gallery behind the rostrum. Seats are provided for 808 worshippers. Beneath the chapel is a schoolroom of like dimensions, and the baptistery is placed in this portion of the building, in front of a raised platform. Adjoining is the minister's house, containing nine rooms. Mr. C. F. L. Horsfall is the architect, and the contractors have been:—Masonry, Mr. Thomas Bottomley, Lindley; joinery, Mr. J. Wilson, Elland; plastering, Mr. T. Wadsworth, Elland; heating apparatus, Mr. J. Calvert, West Vale. The total cost has been about £3,200.

Brighton.—The church of All Souls was reopened on Sunday after internal restoration. The old flat roof has been replaced by an arched one of stained pine. The eastern end is shut off as a chancel by a screen of pine, and a reredos of the same material, of Grecian character, with fluted pilasters and pediment; the arch above has been coloured in blue, gold, red, and white; stalls with carved heads have been placed in the chancel, the pulpit has been altered and modernised, and removed from the centre to south side of chancel, and a lectern added. A new organ, with open metal pipes, has been built by Mr. Farrant. The galleries are refronted, and sunburners and argand burners give better lighting to the church, which has been fresh painted throughout. The work has been executed from the designs of Mr. E. G. Scott, of Regency-square, Brighton, at a cost of £1,800. Mr. Barnes, also of Brighton, was the builder.

City.—The new City Carlton Club will be ready for occupation in October. The principal entrance is in St. Swithin's-lane, where a stone frontage with granite columns and bronze metal Corinthian capitals extends to a length of over 50ft., and has a height of over 40ft. On the south side is a bay window, and on the north a portico with granite columns and carved tympanum. In the Sherborne-lane, or tradesmen's entrance, the frontage is 70ft. long and 56ft. high. On the ground floor is the coffee-room, measuring 70ft. by 27ft. 6in., and upwards of 26ft. high, a reading-room 40ft. by 18ft., and 14ft. 6in. high, and two waiting-rooms. From the hall a wide staircase, lit by a lantern from above, leads to a mezzanine floor, on which are smoking and card-rooms, bath-room, and lavaories, and to the first floor, which is planned as billiard-rooms, card-room, reception-room, private dining-room, and three dressing-rooms. Immediately above, occupying the whole length of the Sherborne-lane front, is the kitchen, light and well ventilated, and larders and stores. The upper floor of the building is reserved for sleeping-rooms and servants' offices. In the basement of St. Swithin's-lane front are a lavatory for members and the secretary's and clerk's offices, and in that facing Sherborne-lane are still-rooms, servants' hall, and in the sub-basement cellarage is provided. Communication between the kitchen and basement is obtained by patent lifts. The architect is Mr. E. Roberts, the builders are Messrs. Perry and Co., of Bow; Mr. H. Hall is clerk of works, and Mr. A. J. Wheatley is the builders' foreman.

Halifax.—A new bank is being erected for the Halifax Commercial Banking Company. The exterior of the building has been treated in a free adaptation of Lombardic Gothic. The ground-floor windows are wide single lights with double shafts to the reveals, pointed arches, labels, and sunk panelled dadoes. The first-floor windows are double lights with double shafts and quatre-foil tracery in the heads. The second-floor windows are clustered single lights. The building is crowned by a bold cornice, and perforated parapet, above which are large stone dormers, with double shafts to the front, and single shafts to the reveals, in two lights, with moulded tracery to the heads, and an enclosing arch. The different angles of the building are finished with pinnacles. Mr. Slater is the clerk of works. The amount of the contracts is £8,300, exclusive of land and furniture. The building has been carried out from the designs and under the superintendence of Messrs. W. and R. Mawson, architects, of Bradford.

Hanley.—The foundation-stone of a new Congregational Church at Milton was laid on Monday week. Mr. Bennett, of Burslem, is the builder. The architect is Mr. A. R. Wood, of Tunstall, and the works have to be completed under his superintendence. It is intended to erect a schoolroom and a chapel above, both having a length of 46ft. and 24ft. wide. The schoolroom will be 11ft. high, and the chapel 21ft. The general design is Free Italian, carried out with red pressed brick, and terra-cotta and stone dressings. The accommodation of the chapel is for about 225 persons. Both school and chapel will be heated by hot air, and ventilated by Hill and Hey's siphon ventilators.

Madron.—Last week the new rooms for girls and infants added to the Daniel School, Madron, Penzance, were occupied. Mr. John Trounson, architect to the governors of Daniel School, has designed the building. The walls are of local moor stone, random-razed, with rustic coigns and dressings of granite. The chimney-stacks are of faced and moulded Bridgewater bricks laid in Portland cement, and the slated roof is furnished with three scrolled ridge tiles. The chief architectural feature is the gabled end facing the village green. Over a large window are the arms of Daniel, the original founder of the school, boldly carved in Portland stone by Mr. H. Hems, of Exeter. The contractors were Messrs. Ford and Trythall, Penzance, masons; Mr. J. Gendall, Madron, carpenter.

Oakham.—Brooke Church, near Oakham, was reopened last week. The more ancient portions of the church are believed to be the work of the Augustine brotherhood, on their taking possession of the manor given them by Hugh, Lord Ferrars, of Oakham Castle, at the close of the 12th century, and are thought to have formed part of the Priory Church. The architecture bears out this supposition. The nave arcade, the tower, arch, and belfry, the south door and doorway, and the font belong to this period, and are all of great beauty. The more recent portions of the church belong to the time of James I. The architects employed were, for the chancel, Mr. Christian, architect to the Ecclesiastical Commissioners, and for the rest of the church, Mr. Tait, of Leicester. The church was illustrated by us a few years since.

Ribbleton.—A new church is about to be built at Ribbleton, near Preston, from the designs of Messrs. Garlick, Park and Syke, architects, of Preston. The church will be of plain and simple character, and Early English in style. It will consist of a nave 53ft. by 24ft. 6in.; chancel, 27ft. by 20ft.; organ chamber; and tower, carried up square and finished with battlement and parapet. In this tower will be the heating chamber in the basement, over this a vestry, and in the ringing chamber a peal of bells. The outside walling of the church will be of pier-points, and all the dressings and internal work will be from the Longridge quarries. The roofs will be open timbered, of red deal, covered with grey slates and red ridge tiles. The seats and fittings will be of pitch-pine, stained and varnished. The floors of chancel and sacrarium will be laid with tiles and the nave with flags. The church will accommodate 200 persons, and will cost £8,000.

Walsingham.—The parish church of Walsingham has been enriched by the gifts of a reredos and lectern. The reredos, representing Christ instituting the Sacrament, the panels on either side being the raising of Jairus' daughter and the raising of the widow's son at Nain, is painted on wood, and is the work of Messrs. Gibbs and Howard, of 64, Charlotte-street, Fitzroy-square, London, from a design by Mr. W. E. Nesfield, architect. The lectern is of polished brass, a pillar surmounted by a globe, upon which stands a model of an eagle.

Yarmouth.—The erection of the Yareside Iron Works, at Southtown, was celebrated on Friday week by an opening dinner. These new engineering works have been erected for Messrs. Alexander and Wright, and cover an area of 32,533ft. super. The front is of red and white and coloured brickwork, with stone dressings, and above the pediment is a bell turret containing a clock. The roof is covered with slates, and has Staffordshire ridge tiling. The chimney shaft, about 75ft. high, and circular, is made an ornamental feature, in red and white brick, with heavy stone capping. Next the main road is a boundary wall 187ft. long, and 4½ft. high, with moulded panels of red and white brick, surmounted by iron palisading between the piers. The woodwork is of pitch-pine; the floor of the engine-room and chief rooms are of Minton tiles, the others being of Portland cement concrete. Mr. H. Dudley Arnott, of Gorlestone, was the architect, and Messrs. B. Springall and Son, of Yarmouth, the contractors. Mr. Stanley executed the stone fittings, and Messrs. Gray and Palmer the gas-fittings.

CHIPS.

Lady Mary Fox, the widow of Sir Charles Fox, the contractor for the Great Exhibition of 1851, died last week, in her 71st year, at Pembroke-road, Kensington.

In our last issue mention was made, in connection with the Merchant Taylors' Company's extension, of the buildings now being erected on the north side of Cornhill, which was calculated to lead to the impression that all the work was in the hands of the same architect, whereas we are informed the shops and suites of chambers referred to, Nos. 68 and 69, Cornhill, are entirely distinct, and are being executed by Mr. Chas. Fish, of Pimlico, from the designs and under the superintendence of Mr. Thomas Harris, of High Holborn, for Messrs. Lamplough and Co., Mr. Taylor being the clerk of works.

The fine collegiate church of Southwell (Minster) is about to be restored, from the plans and designs of Mr. Ewan Christian. The twin western towers are to be surmounted by spires, the roofs will be considerably raised, the interior repaired, and the chapter-house brought back to its original condition. Eight tenders have been received for the execution of the work, and the lowest but one, that of Mr. Clipsham, of Norwell, near Newark-on-Trent, has been accepted at £17,319.

A recumbent effigy of the late Archdeacon of Stafford has been placed on an altar tomb in the south aisle of Lichfield Cathedral.

The memorial-stone of a new U. P. church was laid in Daisy-street, Govanhill, Glasgow, on Saturday. The church is Gothic in style, will be divided into area and galleries, seating in all 1,000 persons. At the rear will be class-rooms, vestry, session-house, and ladies' room. The cost will be £4,600; but the scheme provides for the ultimate addition of a lecture-hall to the group of buildings at a further cost of £1,200.

The town council of Hastings accepted, on Friday, a tender of £12,180 for the erection of the new municipal buildings. These will include a county-court, police and other offices; but the idea of including in the group a large town hall has been, after much wavering, abandoned, on economical grounds.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J, Passmore Edwards.

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Cases for binding the half-yearly volumes, 2s. each.

Received.—H. O. and Co.—W. H. S. and Co., M.—M. and Co.—B.—B. I.—S. P. Co.—H. and Co.—B. of S.—J. M.—J. P. B.—G. G.

Fifty-five. (Write B. T. Batsford, 52, High Holborn.)—P. T. and Francis Edwards. (Write the Secretary, Great George-street.)—"Che Sara Sara." (We cannot, not having the drawing now before us, modify our opinion. What we objected to was the cross framing introduced in the part above the bay, and it does not make any difference whether the part in question was a bay or a balcony, as the effect is the same. As regards the second point, we are glad to note your correction; the error was a misprint.)—W. W. Bond. (Notice will appear of the resumption of the Designing Club.—Yes.)

Correspondence.

HULL ASYLUM COMPETITION.

To the Editor of the Building News.

Sir,—As I see you last week admitted comments on or corrections of your critiques on these designs, I hope you will allow me to make one or two remarks on your otherwise very favourable review of my design. 1st. Your reporter says "the central corridors do not appear to be well furnished with light," on which I would remark that I think he cannot have observed a *large* bay-window in the centre of each corridor, besides *large* windows at each end. 2nd. He says "the beds in the dormitories are arranged in pairs, side by side, which is not a desirable plan." Although this is a very small matter, I may remark that they are so arranged in order to have a window between each pair, and the contiguous beds have a screen between them.—I am, &c.,

"Sunshine All Day," No. 19.

Sir,—The writer who reviewed the drawings of the above-named, in your issues of the 22nd and 29th ult., appears to have given a great deal of careful attention to a very tedious enterprise. I should like to be allowed to point out the fact that one or two misapprehensions underlie his criticisms.

One of these is, with regard to the *architecture*. Your reviewer has apparently looked for fine design, expressive detail, and such like; and, as design after design comes under notice, he expresses his laments on "poor detail," and so on. Is your contributor aware that the proposed asylum is essentially a *pauper* institution? And does he not see in this fact the unsuitability of the fine-art element? With the exception of one gentleman, who has an eruption of seven towers, and one or two other instances, the competitors have unanimously eschewed architectural embellishments, and probably the justices will approve of that course.

Again, your contributor objects that some competitors have not made arrangements for "a recreation room." As a separate apartment this is true of many of the competitors; but, all or nearly all who have not separate apartments for this purpose, propose to use the dining-hall for it. Having adopted this arrangement myself, I am obliged to defend it, and certainly the claims of economy render that defence all too easy. A library would, in my opinion, have had more claim, or a billiard-room, or a bowling-alley. The remark that the double use of the dining-hall would necessitate the removal of the tables and seats betrays a want of realisation of the internal working of an asylum, and explains the objection. It appears that your contributor assumes that the recreation halls would be constantly in use, which is not the case, because otherwise the day-rooms would serve no purpose, and (a still more grave objection) the classification and control of the patients would become more difficult, if not impossible. In connection with this point, it is curious to observe that many of the competitors have entirely overlooked the restriction which the Commissioners in Lunacy have put upon the association of more than ten patients in one dormitory, which is all the more striking because that restriction is one which is obviously founded in the nature of the disease under treatment. In pursuance of this subject, it may be remarked that it is desirable that the incidence of the instructions issued by the Commissioners should be more strictly defined, for it appears that the Gloucester competition has been won in defiance of the very first rule laid down by the Commissioners. Now, this is manifestly misleading, and almost as certainly unjust. Either the regulations should not be issued, or they should be adhered to; or it should be frankly declared that the adoption of the Rules is optional. The southern aspect of the rooms, and the northern approach are two things that speak for themselves, and no planning can get over them.

Whilst admitting the general accuracy of your contributor's descriptions, I must beg permission to deny any "such details as spires" as belonging to my work—even one. I am sorry he could not admire my kitchen arrangements, as I thought they were particularly well arranged; but he has overlooked four good-sized well-lights when he says that the "*maze* of small offices has neither light nor air other than from the roof."

I beg further to express a wish that the Justices may, in their own interests, in the interests of the competitors, and in the interest of fair-play, call in professional advice. Some of the competitors appear to have used mottoes by which they are known; and of them is said to be related to an official of some standing in employment of the Justices; and, further, it is said that Freemasonry is likely to be brought to bear in certain quarters.—I am, &c.,

No. 1.

Sir,—Not having had access to your last three issues until to-day, I have only just read the critical notes and correspondence relating to the above which have appeared therein. May I express my opinion that the question so pertinently asked by your correspondent "Act on the Square" ought to have called forth direct replies from "Argus" and "Lucidus Ordo" respectively in your last number? It is somewhat remarkable that an error of £10,000 could have come within the range of possibility, under any circumstances, after the estimate had been subjected to the penetrating gaze of the hundred-eyed author of the former, and equally so that the latter should have to resort to the introduction of "furniture, bed linen, and general stores" to shed increased lucidity on his evidently troubled and uncertain position. It does strike me, Mr. Editor, that these supplementary explanations would have been better omitted altogether; but the quality thereof, perhaps, ought to be judged by their emanation from local competitors, or otherwise, as the case may be. If from the former, in the estimation of any high-minded and honourable adjudicator, they could scarcely be regarded otherwise than as disqualifying communications, and sufficient to exclude the plans to which they apply entirely from the competition. "One who has carefully studied the levels" correctly points out that the descent in the site is more rapid from west to east than it is from north to south, and that, therefore, the unfavourable remarks in your critique with reference to the designs presenting their principal elevation to the west are altogether inapplicable. Accurate sections of the site ought perhaps to have been given with the printed instructions to architects, but in the absence thereof the statements just referred to herein, as bearing thereon, are confirmed by

A Competitor who Carefully Took the Levels for Himself.

Dartmouth, Sept. 9, 1879.

Sir,—"Lucidus Ordo" takes exception to the review of his design.

His first objection is to our statement of the main corridors being merged into those of the blocks. We admit, as pointed out by "L. O.," the corridors are continuous on three of the four sides of the parallelograms; but our remarks applied to the fourth sides, *i.e.*, the south or main front where the blocks are in great part disposed. They are in this the most important part of the asylum, turned into private corridors for the use of the patients, and there is practically no connection between the extreme blocks over the southern front and the great central block devoted to dining and recreative purposes. We have proof that the author is aware of this defect, although he takes exception to our pointing it out, for on p. 4 of his report he says, "The gallery is 12ft. wide . . . the day-room projects to the south, and is easily separated from the gallery by a partition, and thus, if thought advisable, the gallery being empty (as the infirmary patients would be in their day-room) would serve as a corridor for those patients in No. 2 [the adjoining blocks] who might be considered fit to use the general dining-hall." It is clear from this that the main corridors are merged into the private corridors, and that patients in certain blocks must pass through the throng of the patients in other blocks to gain the dining and recreation-halls, or they must traverse three sides of a great square of corridors, and in doing so pass the entrance doors of the asylum, which would require to be always closed and guarded to insure the safety of the patients, who have clearly no right to be brought to this administrative point in the north corridors. If the patients were unfit to make use of the dining-halls, the same difficulties would present themselves to the officials who would have to convey the viands from the kitchens to these isolated wards.

The second objection is practically the same as the above, and has reference to the non-continuity of the corridors. We here hold to our remarks that they are broken by serving or waiting-rooms, by day-rooms, dormitories, &c. Take the line of the south façade where the south corridor exists, or is supposed to exist; in passing from one end to the other, we should pass through the male and female infirmary blocks, and through the male and female serving rooms, which are offices placed between the kitchens and the dining-hall. It is clear that wherever communication is required between one part of the asylum and the other, the cross corridors must be traversed, and the north corridor, the only continuous one, must be made use of. Now, as the patients' blocks are all situate on or near to this south line of corridor, the objection to such an arrangement is very great.

"L. O." further objects to our calling the semi-circular bay of 10ft. the central feature of the 700ft. frontage. We used this term advisedly, because it is the correct one, as the main façade stretches right and left in symmetrical order from this point. He further denies that the lower windows, owing to their being crossed by the internal staircase, must, of necessity be blind windows. We fail to see that they can be other than what we have stated, and we advise the author to work out this detail, and as the staircase starts about one foot below the level of the west window, and lands about one foot above that of the south window, he will find that the staircase will cross the whole of these three windows, which must of necessity be treated as blind ones.

"L. O." further objects to our remark that the epileptic patients are unprovided with day-rooms, and he states that he intends them to use the day-rooms in the wards on the floor below, which are practically the day-rooms of the acute cases. From this it is clear that our remarks stand good. The sending of one class of patients out of their dormitories into the public galleries, and down the public staircases into a separate ward devoted to a separate class of patients on the lower floor, is a plan the feasibility of which we question.

He next objects to our remark that "the staircases are placed at random," and he states that these constructions are placed at each end of every block. We adhere to our statement, and we take exception to that of "L. O.," as the staircases are not placed at each end of each block—at least, not in the sense that his remarks would imply. They are in every case placed in the centre of the corridors which link or connect the blocks, and they are placed on the opposite sides of these corridors to the wards themselves. They cannot fail in this position to give us the idea that they have a very confused connection with the wards themselves (the most important ones): those immediately adjoining the dining-halls, have the same relation to the dining-rooms and the recreation-hall above as they have to the adjoining wards. Had these staircases been placed as "L. O." states, at each end of every block, he would have made use of them, in the case of the largest blocks, to reach the second floors; but as he could not do this in their present isolated position, he was compelled to provide other and separate staircases in the blocks themselves, and we think, in the face of this, we were fully justified in using the term, "random" in connection with the disposition of the principal staircases.

"L. O." next takes objection to our remark that "the towers over the staircases are not placed to serve the purpose of ventilation." We adhere to our remarks, although we have read his report about placing hot-water tanks therein. We maintain that it is impossible for them to be used for purposes of ventilation, inasmuch as they are placed at some distance from the wards, and the connecting corridors, except on the ground-floor, are lower in their ceilings than those of the wards. Further than this, the main wards are three stories in height, and the corridors only two, hence the upper floors have no connection whatever with the staircase towers. We really cannot understand the author's object in correcting us on such a point, especially as he shows on sheet No. 11 a system of ventilation where the vitiated air is discharged from air-flues leading above the eaves of the wards, a system that has no pretence to association with the staircase towers.

The next exception we have to deal with is our remark that the "accommodation is for 400; but as the beds are not shown, this cannot be easily confirmed." We drew our information from the schedule furnished on p. 5 of the report as follows:

No. 1.	Blocks, single rooms and dormitories	164
No. 2.	,, ,, ,, ,,	70
No. 3.	,, ,, ,, ,,	130
	Total	460

This does not appear to be cast up correctly, but that is a matter outside our office. We noticed that the author in his report suggested accommodating 10 extra female patients in the housekeeper's department, but if he had intended these to be really included in the total accommodation they should have been inserted in the schedule. With respect to the beds being shown, we thank "L. O." for calling our attention to the fact that he furnished this detail on the enlarged drawings; they were most certainly omitted on the general plans, which were those we were mostly engaged upon, and hence we failed to note them. The final objection "L. O." takes to our review is in the cost of the building proper being given as £38,000, which with the adjuncts is £56,000. His contention is that we ought in the latter to have omitted the item designated "fittings," and have given the grand total as £46,500. Our contention is that, if "L. O." had not intended this item to rank in his adjuncts, he should not have introduced is in his figures. He seems to have repented it introduction in his report, for, as stated in the preamble of our review, he wished the judges, through an explanatory note, to take it to imply "furniture, bed linen, and general stores."

We have, in conclusion, to state that we wish our review of these plans to stand in its entirety, with the exception that the beds are shown on one portion of the plans, which is a detail we had overlooked.—Yours, &c.,

The Writer of the Review.

ST. LAWRENCE' CHURCH COMPETITION.

Sir,—I notice you record to-day the award of the St. Lawrence' committee, with reference to the above Competition, and being cognisant of several facts relating to the case, I feel compelled in justice to those who unfortunately sent in plans for such competition to ventilate the matter through your columns, trusting that it will be a warning to others in the future.

A few months ago, a circular was forwarded to six architects inviting them to enter their names as competitors for a church for the parish of St. Lawrence, in the City of York. The design had to be Gothic, and the cost of building the same about £6,000, and it was also intimated that professional assistance would be called in, probably that of Mr. Street, R.A., to enable the committee to come to a just decision with reference to the same. I am fully aware of the pains expended by one or two of the competitors, in order to make their plans worthy of inspection, feeling assured that in Mr. Street's hands they were safe, as regards justice and judgment. In fact, I know that two out of the six made full inquiries as to who would decide before entering their names as competitors, and it would have been much more in accordance with truth if they had been informed that the committee would decide, and it would at the same time have been more to the latter's credit had they not opened themselves to an attack which will certainly lower them in the esteem of the parishioners and others who lack faith in the virtue of the cloth.

It is evident they were wholly incapable to decide themselves, for from remarks which were made in committee, it appears that they were really unable to define what was a Gothic structure; but I trust that the plans will be illustrated in your columns, and at the same time all the plans open to public exhibition, so as to have them fully criticised, and enable those who are competent to have an opportunity of judging.—I am, &c.,

Fair Play.

NEWARK HOSPITAL COMPETITION.

Sir,—Your notice with regard to this competition, in last week's issue, confirms the opinion expressed by your correspondent a short time since, that the decision was practically a foregone conclusion. If, as I hear is the case, one of the principal firms of architects in the district had previously been consulted, and had prepared either sketches or plans for the guidance of the committee, not much can, I fear, be said for the straightforwardness of the committee's proceedings, which can only have had for their object the obtaining gratis as much information as other architects (who believed in the *boná fides* of the transaction) were prepared to furnish. This sort of thing, however amusing to the public generally, is dreadfully "rough" on the unlucky competitors, and is one of those abuses which you, Sir, I know are anxious to expose.—I am, &c.,

Nil.

THE MOSQUE AT CORDOVA.

Sir,—I have read with much interest the graphic description of the Mosque at Cordova in your last issue. Having spent several hours in this "forest of pillars," as it really is, may I mention one or two things which are not in that paper?

1. A small portion of the original roof may be seen, with the Moorish colouring, in a chapel at the south-west corner of the mosque. It is of wood, flat, with narrow beams about a foot apart.

2. The stalls of the cathedral are worthy of attentive observation. At the back of the stalls are carved subjects from Scripture: I think the south and west sides are from the Old Testament, the remainder from the New Testament; in front of the stalls are carved incidents from the lives of the Saints. They are by Pedro Duque Cornejo, c. 1257. The series begins at the south-east corner.

3. On the Alcazar, which is now used as the prison, there is a very curious chamber in the eastern tower. It is octagonal and vaulted, the pillars are surmounted with square capitals of flowers and leaves. There is, I was told, undoubted evidence, architectural and otherwise, that this chamber in the Alcazar is the original work of the Moors. There is no trace of alteration, and it is about the same age as the mosque.

Perhaps some of your readers better versed in architecture than I can pretend to be, will be induced to visit this interesting city.—I am, &c.,

Somerleyton Rectory, Charles J. Steward.
Lowestoft, 9th Sept.

WELLS-NEXT-THE-SEA CHURCH.

Sir,—A correspondent having called attention to the church which has met with such a disastrous calamity lately, the following particulars, gleaned from various sources, may be of interest to your readers.

The church was a splendid building, dedicated to St. Nicholas, and built, in the Perpendicular style, of flint and stone, as most of the Norfolk churches were about the middle of the 15th century. It consisted of a nave, north and south aisles, and clerestory, a chancel covered with lead, south porch, vestry, and a noble square embattled tower, having eight bells and a clock. The aisles are peculiar, extending to half the length of the chancel, and the spandrels of their roofs were filled with rich geometrical patterns, intricate tracery of foliage, with small birds perched in it, and other curious designs. The roof of the nave had been very fine, the wall-plates had two rows of Tudor leaves, and the flat space between the mouldings was relieved by angels with extended wings, the pendants being terminated by angels bearing shields. Rows of small Tudor leaves ran round the panels, and angels with shields covered the intersections of the ribs and principals, as well as the ridge-piece. The woodwork of the entire roof was of sweet chestnut.

In the chancel is a very beautiful doorway, opening into the vestry, having in the hollow of its mouldings an elegant design of a flowing stem, on the one side of which are vine-leaves and fruit, and on the other, birds with extended wings, picking the grapes. Near this door, and on a gravestone near the communion-table, is the brass of a priest, with a Latin inscription to Thomas Bradley, formerly rector of this parish, who rebuilt the chancel, and died in 1499. On two labels of this brass are written—"Jesu, mercy. Lady help." And "Orate pro a'i'a, Thos. Bradley, qui quondam fuit rector ecc'lie de Wellys, et qui fuit p'bendarius ecc'lie de Plessy, Oct. 5, 1499." Halfway, in the north aisle, was a small doorway, which conducted to a newel staircase, in good preservation up to the time of the fire. This doorway led to the rood loft, the door of which was in the northern pier of the chancel arch, immediately above the screen. A very fine brass lectern, in good preservation, and probably co-eval with the church, stood in the middle aisle a short distance from the screen. It consisted of an eagle, with outspread wings, perched on a globe, and supported by a substantial pillar, with bold circular mouldings, having a circular-moulded base borne by four griffins. A piscina, with fuertella, was discovered in 1866, at the eastern extremity of the north aisle, proving that the end of this aisle was formerly used as a chapel. Over the south porch are four shields carved in stone, having three lions guardant in pale-passant, a chief indented vairy, a chevron between three annulets. Above the south porch in the church the whole history of the flood is painted, and over the north door that of Jonas. Over the vestry-door, on the north wall, a little tablet of marble, with the arms of Murray az., three mullets, argent in a double tressure of Scotland. The east window contained the arms of Lord Stafford, and the date of their presentation was about 1460. The font has been engraved in the Archæologia.

Trusting that all information is acceptable of a church which is about to be restored,—I am, &c.,

Edw. Preston Willins.

Erratum.—In Mr. H. J. Green's letter, published last week, p. 296, asking for sketches or measured drawings of the church of Wells-next-the-Sea, Norfolk, by a clerical error, the edifice was said "not" to be a large church. Mr. Green informs us that the church is one of the principal ones in Norfolk, being 180ft. in length, and of proportionate width, having aisles to nave extending as chapels half the length of chancel.

DANGEROUS STRUCTURES.

Sir,—May I ask you to insert in your next issue the following Official Report, which I have made to Mr. Vulliamy, the superintending architect of the Metropolitan Board of Works, with reference to *a singular decision* given by Mr. Mansfield, on Wednesday last, to the effect that *temporary shoring* makes a building *permanently safe* under the Building Act. I fear the results will be to multiply *Haymarket smashes*.—I am, &c.,

Robert Walker.

21, King William-street, Strand,
Sept. 10th.

Copy of Report sent to Superintending Architect and the Home Secretary.

21, King William Street,
West Strand, W.C.
September, 1879.

re Dangerous Structure, 29, Haymarket.

Dear Sir,—I beg to call your attention to the decision given by Mr. Mansfield, at Marlborough Street Police-court, on Wednesday last, with reference to a dangerous structure in the rear of 29, Haymarket. The house, 28, Haymarket, has been lately taken down for the purpose of being rebuilt, and the premises, No. 1, Arundel-place, adjoining it in the rear, which also abut on the back of 29, Haymarket, having been found in an extremely dangerous condition, an order was made some weeks ago, by Mr. Mansfield, for the removal of the inmates, and for a considerable portion of the building to be taken down; and also for the removal of the side wall adjoining belonging to No. 28, Haymarket. While this order was being complied with, it was discovered that there was a vault on the ground-floor of No. 1, Arundel-place, which belonged to Mr. Fagg, the owner of 29, Haymarket (the properties being intermixed). This vault is about 8ft. wide by 9ft. long, and is arched over by a brick arch, which is only 4½in. thick, and covered with rotten brick rubbish, whilst the side of the arch springs at its abutment from a defective wall only half a brick thick. My attention was called to this by an order from the Board to report as to its safety on August 13th, and on inspection I found it so dangerous that it was impossible for Messrs. Kirk and Randall, the contractors, who are executing the work adjoining, to comply with the magistrate's order already made, to take down the dangerous structure above it on the one side, and beneath it on the other. In fact, so imminently dangerous did I consider it, that I advised the owner, without a moment's delay, to employ Messrs. Kirk and Randall (as they had materials on the spot) to put up two temporary struts on the other side with cross pieces at once, to support the arch, in order to prevent a catastrophe, and this suggestion he at once adopted. Nothing has since been done, and the case was heard by Mr. Mansfield on Wednesday last, when counsel and witnesses on behalf of Mr. Fagg, the owner, though they admitted the structure was *not strong enough to stand by itself*, yet attempted to prove that, because it *had been shored* it was safe, and though I gave evidence (which was corroborated both by the foreman and architect to the works adjoining) that the wall and arch were liable to fall at any minute, notwithstanding the shores, yet the magistrate, in giving his decision, said that while he considered it was a very dangerous practice ever to have erected such a structure, yet, as the witnesses on the other side had stated it was shored, he considered it was safe, and should dismiss the summons. The Board's solicitor, Mr. Napier, tried to get me recalled to give evidence as to the insufficiency of the shores, but the magistrate declined to hear me; and upon my pressing him to view the structure before deciding the case he refused to do so, and said *he himself would take the responsibility*. The decision of Mr. Mansfield, I submit, is wrong in law, and against the facts. Sections 72 and 73 of the Building Act specify that when a district surveyor has reported a structure to be dangerous, the Board shall shore up to protect the public; and if the owner then fails to comply with the requisition served on him as speedily as the nature of the case permits, he shall be prosecuted by the Board before a magistrate, who shall make an order for the necessary works to be done. If the Board are entitled to prosecute after shoring up, Mr. Mansfield's decision is *evidently wrong*. Simply shoring a building cannot make it legally safe, and in the clause giving the magistrate power to order the necessary works to be done, shoring is not even mentioned, and it is obvious that such works must be done *in accordance with the other clauses of the Building Act*, which distinctly *prohibit* buildings from being *secured by timber*. But if the magistrate's decision is right, *every building* which is *shored up is safe*. I consider this case so important that I must ask you to bring it officially before the Metropolitan Board of Works, and I inclose photographs and drawings which will explain it. I may add that the contractors have taken their men away from this part of the works, and, in my opinion, it would be an *act of madness* on their part to attempt to remove any more of the upper and lower structures already condemned by the magistrate till this rotten and fragile *intermediate erection* is removed. In fact, I fully anticipate that an accident with consequent loss of life will occur, unless some prompt steps are taken. The contractors also inform me that they have given the magistrate notice they will not be answerable for the result of his decision, both as regards *life and property*. Upon examining the struts on Friday last, I found they were so unsafe that they could be shaken by the hand; and I have, therefore, now given a fresh certificate to remove the insecure and dangerous shores, and all works supported by them. I need scarcely point out the hardship and injustice inflicted on myself by the *summons being dismissed*. I not only have to pay costs in the matter, but am practically *censured for doing my duty*, simply because, as an act of courtesy, I directed Messrs. Kirk and Randall's foreman to place some struts against an adjoining house to prevent an accident and loss of life, whilst those gentlemen, for carrying out my instructions, have their works stopped, and their workmen's *lives endangered*. District Surveyors, by Mr. Mansfield's decision, will be put in an akward dilemma. If they find a building falling and promptly get it shored up, they are then told it is safe and *cast in costs*, and if they let it alone pending the *law's delays* and *someone is killed*, there is all the annoyance and worry of a *coroner's inquest*. The Haymarket accident, which happened three doors from the spot in question, a few months ago, was to a great extent the result of the uncertain way in which the law is administered in these cases, and as a public officer called upon to give evidence to enforce the Building Laws, for the protection of human life, I cannot let this question rest in its present unsatisfactory state. I may mention that Mr. Vaughan, Sir James Ingham, and other magistrates have never refused my request to inspect structures such as these before giving their decision.—I am, yours obediently,

Robert Walker, F.R.I.B.A.,

District Surveyor of St. Martin-in-the-Fields.

To the Superintending Architect, Metropolitan Board of Works.

I have sent a copy of this letter and photographs both to the Home Secretary and Mr. Mansfield.

CHIPS.

A series of additional wells have been sunk at the waterworks of the Hastings Corporation at Buckshole Valley, and have just been connected by adits with the older wells, so as to largely increase the water-supply of the towns of Hastings and St. Leonard's.

A new coffee palace was opened in High-street, Notting-hill, on Friday. The structural alterations and fittings have been executed by Mr. Henry Ashwell, of Great Marlborough-street, W.

The parish church of Whetstone, on the Middlesex side of Barnet, is being enlarged.

The local board of Leyland, Lancashire, have received reports from two engineers, Mr. Tomlinson and Mr. Roberts, with reference to providing a supply of water to the district. Each scheme proposes tapping the underlying red sandstone rock rather than bringing water from the Liverpool and Preston systems, and the cost of each is estimated at between £4,000 and £5,000.

The guardians of St. Olave's, Southwark, have received the following number of tenders for new machinery, &c., for the infirmary, of which Messrs. H. Saxon Snell and Son, are the architects; eight for boilers, seventeen for lifts, fourteen for fire main, and five for sinking an artesian well. The tenders have been referred to the architects to analyse and report upon.

The North Metropolitan Tramway Company have recently completed two extensions in the East of London, the one an extension of the Victoria-park line into the Broadway, South Hackney, the other carrying the Cambridge-heath line northwards to Dalston. Tramways are about being laid through Rotherhithe, and some discussion took place at the meeting of the vestry of the parish, on Tuesday week, as to the size of the cubes the company should be ordered to put down between the rails. Eventually it was agreed to accede to the request of the company's engineer, Mr. Dixon, and allow a 7in. by 4in. cube to be laid.

The fountain which is to be placed at the north-east end of the churchyard of St. Paul's Cathedral is now in process of casting. It is a large bronze structure, and has been designed by Mr. F. C. Penrose, the Cathedral surveyor.

A series of drainage works are about to be commenced at Ballyadams, Queen's County, which it is hoped will result in the reclamation of 800 acres of land, at present almost valueless because constantly saturated by water.

Two additional bells, cast by Messrs. Blews, of Birmingham, were hung last week in the tower of Ashburton parish church.

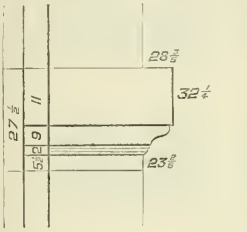
Intercommunication.

QUESTIONS.

[5885.]—**The Use of the Pulley in Buildings.**—Considering the value of the pulley, something should be done to make a better use of it in building. After spending some leisure time thinking over it, I should like to hear if my views have ever been tried, and if so with what success, or what objections are urged to them. They are as follows:—For lifting materials in a small building, fix a pulley at the height of the building against an adjoining wall or otherwise, and now employ two labourers to carry bricks, &c., up to the bricklayer. A man goes up the ladder in the ordinary manner, empties his hod, and steps on to a cage connected with a rope around the fixed pulley, the other end of the rope being fixed to a similar cage, which the second labourer has loaded with bricks. Theoretically, the bricks might be nearly the weight of the man, and thus, as the man went up the ladder, he would carry an ordinary hod full of bricks, and when he came down (and he might then be seated) he would carry up considerably more bricks. The second labourer would load the cage the first labourer had come down in, while the latter was again carrying up a hod full of bricks, to come down in the other cage. Again, such continual rests for the labourer would enable him to do considerably more work and be less fatigued.—W. Hofmann Wood.

[5886.]—**Legal.**—I formed a building club of members who pay £1 per month for a certain number of years to a building society, who advance the money to build the houses from my plans. One of the members now says he was a minor when he signed the articles of association: (1) Can he on that plea withdraw from the society? (2) Can he do so if I can prove that he told me when he signed the agreement he was twenty-one? (3) Can he do so if I can prove he has paid money since he was twenty-one? (4) Can he or his guardians claim that the money already paid by him shall be returned? (5) What is the position of the—Provincial Architect?

[5887.]—**Warehouse.**—I am building a small warehouse for light goods. Shall I be safe in using a 9in. by 3in. plank floor with iron tongues (no joists) for a 13ft. and 14½ft. bearing? If not, what would be the longest bearing to give them with safety? Would it be cheaper to put a 3in. plank floor, or a floor of 7in. by 2½in. joists and 1in. flooring boards, considering that you save 5in. in height in all walls? How should plank floors be supported against flues?—Ignorance.



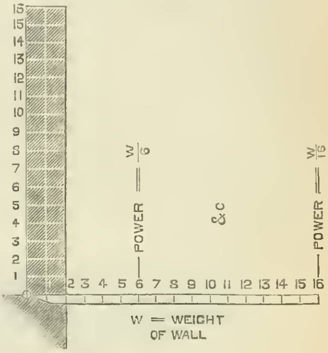
[5888.]—**Minutes.**—In sketch above I give part of a Doric column, with the proportions shown in minutes. Will Henry Ambrose, or "G. H. G.," or some other of our able correspondents, kindly explain what are the minutes, how obtained, and how to mark them off to give the proportions as sketch? An answer will greatly oblige—Star.

[5889.]—**Lattice Girder Bridge.**—Will Mr. H. Ambrose or some other of our readers kindly show how to calculate the sizes and strength of iron lattice girder bridge, also iron columns and bearers for steps for same? The bridge would be of the same kind as those used over railways; the steps at each end at right angles to length of bridge; the ends of bridge to be carried on iron columns; bridge, 8ft. wide; steps, 8ft. wide; length outside, 53ft.; length inside of iron columns, 37ft. clear span; height bottom of steps to floor of bridge, 18ft. Also what would be the safest and best foundation for iron columns, and how fixed?—J. B.

[5890.]—**Peculiar Spots.**—What is it that causes the production of the various coloured spots on mountain granite and limestone boulders, either when built in dry stone walls or in isolated rocks on inland wasterels? The spots are generally circular in form, varying from ¼in. to 1½in. diameter and upwards.—Passim.

REPLIES.

[5787.]—**Strains on Collar Beam Roofs.**—"B. S." now says that a collar should be in compression or not used at all, but put an iron tie rod in the place of collar. Now, originally the dispute was, as now, capable of such ingenious contorsion and reversion of position in argument as to be under such conditions almost interminable. So well as I can recollect (I cannot afford time to read over again so many times), "S." and "B. S." assumed that a collar was either partially or entirely in compression. Now, "B. S." says that when they will not be in compression do not use them; but that was not the question. The assumption was that they were to be used and what strain they took. Now, if we do as "B. S." advises, and use tie-rods instead of collars, how will the tie-rod perform the compressile duty "B. S." wanted to make out was imposed on it in consequence of its position? And again, collars are usually ceiled to: how will he nail his ceiling laths to his tie-rods? Where is here his superior practical knowledge? And again, I distinctly recollect that he wrote of morticing right through his common rafters one-fourth their width for the tenons of the collars. Where is the practical knowledge here? The usual way would be to cut a joint giving an abutment about ¾in. deep and mortice about another ¾in. deep, and have a bolt, nut, and washer, but only where the rafters and collars would be seen and are of some size, also in cases where the scantlings are small, the collars, if not seen, will be notched on or dovetailed about ½in. deep into the rafters and well nailed. I could say much in reply to "B. S.'s" attack on the profession of architecture, but I repudiate the necessity of noticing such remarks as being unbecoming. With respect to the power required to overturn a wall, "B. S.'s" language is, I think, anything but clear. I should express it thus:

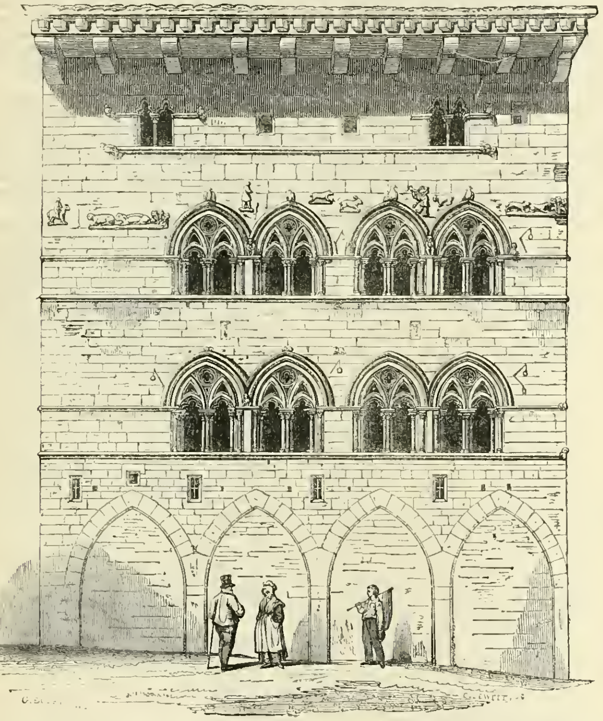


Assume the integrity of the wall, because whatever the mortar may be we may assume it to be alike in all the joints, and the joints will have less power the lower they are, and therefore be more likely to break, and we may assume the bottom one will break at the base of wall. Imagine a horizontal lever under wall with its edge at the intersection of the other face of wall and base of wall, and as long as the wall is high; let fall a vertical line through the centre of wall, then call the end of lever at intersection of wall 0, and the vertical line division 1, and at 1 will be the whole weight of the wall. Then continue along lever similar divisions and number each, and if the wall is so many divisions high, each division will show the power by its number if used as a denominator, with 1 for a numerator, which would overturn the wall if applied at a similar height on the wall above the base as from the 0 to the number of the division in question, and when we come to the end of lever will be equal half the thickness of wall to its height, and from which may be learnt that about 6cwt. applied horizontally as a power at the top would overturn a 14-in. wall 10ft. high and 10ft. long, or $\frac{10}{17}$cwt. per foot lineal, and if he had a span of 10ft. and say, an immovable wall on one side, we should have the effect of the whole weight of the roof bearing as resolved against one wall, say 3 squares to the 10ft. length, at about 45°, say, with wind, say, $\frac{70}{2}$cwt. = 35cwt. at ridge, also 35cwt. at top of wall as horizontal pressure. We shall also have a vertical pressure on wall of, say, 25cwt. on wall at same time, mostly through wind, assumed in both cases. Now, 25cwt. will be a quarter of the assumed weight of the wall, and we may therefore add to our 6cwt. one-fourth, equal together to 7½cwt., and to resist 35cwt. will only be about one-fifth enough, and therefore there must be a tie, and if the tie be wood and placed above the wall plate, it is customary to call it a collar, and it will be in tension. "B. S." believes that the majority must be right. I am aware that that is a prevalent mistake with the vulgar; but I should have thought "B. S." knew better. My own experience is that the majority are usually wrong in opinion on any uncommon subject, and such seems feasible, because there may be many erroneous views and but one right one on each subject. "B. S." has not yet proved that it would take two-thirds of the weight of a roof at 60° pitch to push the plates off the wall. Let x = span and a = resistance of wall plate horizontally, and y = weight of roof. Now, "B. S." says $\frac{27}{3} = a$, but a is constant and $y \propto x$ and x is a variable quantity, and cannot therefore depend on a, which is constant, and $y \propto x$. $\therefore \frac{2y}{3} \propto a$ is impossible where a is constant, whence we deduce the impossibility of the equation. And "B. S." was therefore wrong in his rule, because if right for one span it would be wrong for every other span. The roof failure "B. S." quoted proved to be against his own assertion, because if a collar strong enough had been used, it would have been in tension and not in compression. "B. S." asserts that several masons have become Civil Engineers. If so, they acquired the necessary theoretical knowledge if they are competent, and their having been masons can have but little to do with their present occupation, because we may presume that they know no more of present use to them than their compeers—if they do, I should be glad to know in what it consists; but if not, "B. S.'s" remarks introduce an invidious comparison between Civil Engineers and architects. "B. S." works in some capacity, according to his own statement, under both, either as a workman, or foreman, or clerk of works, and, least likely of all, a contractor, because he would, I should think, then know better than to write as he does. If "Vitruvius's" roof, which "B. S." gave as an example, is not obsolete, where is it in use? And is it no more expensive than our usual ones? And as "B. S." makes it to be the original one in question by "S.," is it an ordinary span roof? What I called absurd was the implied assumption that a tie-beam must be used when the case in question was an ordinary span roof without ties.—Henry Ambrose.

[5874.]—**Apportionment of Cost of Party Walls.**—The point to be decided in the case quoted seems to be the definition of a party wall, and, taking the Building Act as a reliable guide to the settlement of the question, it is clear that only so far as a wall separates two buildings in different occupations can it be considered a party wall; therefore, when a wall divides two buildings of unequal depths, only such portion of it as extends from the front to the back of the shallower building can be regarded as the party wall, the remainder forming part of the external walls of the adjoining building. Accordingly, A is entitled to be paid for the whole of the expense of building the projecting brickwork for B. By the same rule, if B, requiring the deeper building, had erected it first upon the same conditions which governed A, the latter, on joining his building to B's, would only have had to pay half the value of so much of B's wall as was *equally necessary to each building.*—A. W. Saville.

[5881.]—**Animal Carvings on House at Cordes**—The house "Pierre Crayon" refers to is illustrated in Anderson's "Municipal, Commercial, and Street Architecture of France, Italy, &c." He has devoted nine plates to the architecture of this town.—E. T. Scott.

[5881.]—**Animal Carvings on House at Cordes.**—The house at Cordes about which your correspondent, "Pierre Crayon," inquired last week is described and illustrated in Turner's "Some Account of Domestic Architecture in England," Vol. II., p. 339, and by permission of the publishers, Messrs. J. H. Parker and Son, I reproduce the engraving. The house is spoken of as a very fine example of the fourteenth century, and is said to have been the house of the chief huntsman of the Counts of Toulouse.—P.



WATER SUPPLY AND SANITARY MATTERS.

Lympstone Sewerage Schemes.—At the last meeting of the Rural Sanitary Authority of St. Thomas next Exeter, alternative plans for the sewering of the village of Lympstone—the one prepared by Mr. Harbottle, the other by Mr. Martin, came on for consideration. A letter from the ratepayers, protesting against any scheme of sewerage being carried out, was read, but it was decided to go on. A member moved that Mr. Martin's plan, the larger one of the two, be adopted, urging that the ratepayers wished this, if any, to be carried out. An amendment was moved, that Mr. Harbottle's plan be selected, because the less expensive and already adopted by the board; and this, on a division, was carried.

Christ Church, East Knottingley, was reopened on Tuesday week after restoration.

STAINED GLASS.

Stained Glass for the Sydney Exhibition.—Messrs. Camm Brothers, of Frederick-street, Birmingham, and of Smethwick, will be represented at Sydney by several exhibits, which will fully uphold their reputation. One of the chief exhibits is a stained-glass window in the Italian style. The large centre panel contains a representation of "Our Lord blessing little children." Next in importance is a carved oak reredos, containing five panels, which are filled in with tiles painted to illustrate the "Lord's Supper." Beneath the picture, in a Gothic form, are five smaller panels, painted with a scroll pattern intertwined with representations of the vine and wheat, upon which is written:—"This do in remembrance of me." There is also a stained-glass window representing the play scene in "Hamlet," and the artist has departed somewhat from the conventional mode of treating the subject. The work is executed in grisaille, with gold enrichments to the draperies and other parts, and the picture has a border containing busts of eight of the principal *dramatis personæ* and suitable ornamentations. Another window represents three subjects from Tennyson's "Elaine," viz., "Elaine receiving the shield from Launcelot;" "Elaine musing over the shield;" and "Elaine's corpse borne before Arthur." Amongst the exhibits there is likewise a painted encaustic tile panel, the subject of which illustrates the words—"Rage weareth, folly teareth, love mendeth, and death endeth." The tiles are only semi-glazed, and this, therefore, gives to the painting a subdued tone. Included in the minor works to be shown is a memorial tablet, the subject of which is "The Good Shepherd." Several frames of designs, one of which represents "Court Leet in the Olden Time," are also to be exhibited, and the whole are highly creditable to the firm. Most of the works were designed under the direction of Mr. T. W. Camm.

A meeting was held at Bridgwater on Monday of the first commissioners under the Somersetshire Drainage Act of 1877, to receive the reports and maps, &c., prepared by the four principal county surveyors, Messrs. Whitehead, Hippisley, Sturge, and Parsons, of the Bruce, Axe, and Parrett districts which it is proposed to place under the commissioners' jurisdiction. Drainage boards will hereafter be created for each district, with power to appoint representatives on the permanent commission.

Our Office Table.

Aided by the director of the Royal Galleries of Paintings at Dresden, and by a number of private gentlemen, Herr A. Gutbier, of that city, has succeeded in bringing together a very interesting collection of works of art representing the chief productions of Raphael. The exhibition, which was opened in the middle of August, occupies a number of rooms in the Exhition-building at Dresden, placed at the disposal of Herr Gutbier by the Saxon Minister of the Interior. The catalogue, which has been drawn up on the model of Rolandi's excellent list of the Raphael collection at Windsor, shows that the present exhibition consists of not less than 1,376 reproductions in oil, water-colours, copperplate engravings, colour prints, and photographs. The whole are classified under the heads of Raphael's portraits, Old Testament, New Testament, various religious pieces, Holy Family, life of the Virgin Mary, saints, various portraits, Vatican frescoes, Loggia, various frescoes, architectonic works, sculptures, drawings, and studies. The collection accordingly presents a rare opportunity for inspecting and comparing the entire series of this great painter's productions and the different stages of his development. In addition to this collection of reproductions, the exhibition includes 29 original and, for the most part, well-authenticated drawings, lent from the collection of Prince George of Saxony, the Royal cabinets of engravings at Dresden and Munich, and the collections of Count Renaud-Riesch, of Nischwitch, near Bautzen, Baron von Biegeleben, Herr B. Jolles, and Madame Grahl, of Dresden. There is, further, a collection of 19 paintings in oil and sketches, the authenticity of which is disputed, and upon which the judgment of Raphael connoisseurs is solicited.

The programme of the Birmingham Society of Arts and School of Design, for the session 1879-80, which commenced on Tuesday, has been issued. It is proposed to hold a conversazione in the Town-hall during the week ending 22nd February, and during the same month the president, Mr. William Morris, will deliver his address. Similar arrangements to those of last session have been made for the various classes and lectures. Among the special prizes offered to students is one of five guineas, which is offered by Messrs. Hart, Son, Peard, and Co., of London, for a design for a screen in wrought iron and brass for the chancel arch of a church, designed in the style of the 14th century. Fifteen free admissions to the school, tenable for two years, will be awarded at an examination in July next. There is a new feature this year in the major scholarships and free admissions. In each succeeding year, commencing with 1880, a scholarship of £40 per annum, with free admission to the school, tenable for two years, will be awarded. The competitions will be limited to students who have held a minor scholarship for two years.

Mr. Maurice Mauris, the explorer of the Amazon, says that sawmills are much needed in Brazil, and that their establishment could not fail to prove extremely profitable. In many cases, more especially on the Madeira, the current conveys the largest logs of excellent woods, which the sawyer would only have to capture and land. At Serpa, near the mouth of the Madeira, a Portuguese speculator built a sawmill, and the cedar carried down the river supplied his concern in five months with sufficient timber for a whole year's work. So well did his work prosper that this speculator was enabled to retire after a few years independently wealthy, although he had beeen assisted only by the rudest machinery and unskilled, intractable workmen. Though situated on the confines of a vast forest, Para consumes large quantities of North American timber, only a single sawmill existing in the city. A dozen boards of red cedar (a very common wood) cost about £6 at Santarem.

One of the effects of the panic of 1873 was to defeat certain railroad projects in Virginia, and suddenly check the growth in its infancy of a grandly laid-out city near Quantico, in Prince William County, in that State, about 30 miles down the Potomac. New York capitalists purchased there a tract of land—about 7,000 acres. This land they laid out in streets, avenues, and squares, and named it Potomac City. Mr.

Bangs was so confident of the success of the enterprise that he immediately had erected, near the intersection of Potomac Avenue and the railroad, a large hotel. This is a concrete building of four stories, containing 122 rooms, and cost 68,000dols. This building, now occcupied only by some one to care for it, has long been a wonder to those who have caught sight of it from passing cars or steamers. The inclosure surrounding it having once or twice been cultivated in corn, gave it a still more singular appearance—a hotel in a cornfield.

Though a large outlay has been expended in improving the sanitary condition of Brighton, there is yet something to be done to render the streets free from nuisance that is at least unpleasant to the olfactory sense of its visitors. During the heavy rains of last week the gullies emitted a most offensive smell in several parts of the town. A correspondent, recently visiting the town, informs us for a long time he could not discover from whence the horrible effluvia proceeded, but in passing near the over-gorged cesspools in the street, he soon discovered the origin of it. The facts show that with all the precautions taken to insure immunity from sewer gas by the shafts for ventilation, there are still some unguarded points, demonstrating the inadequacy of its arrangements under certain conditions of the tide or pressure in the upper parts of the town.

The Fothergill Gold Medal is offered by the Society of Arts for the best means of protecting ships from loss by fire and by sinking. A silver medal is offered for the best means of protecting ships from fire, and another for the best means of protecting them from sinking. The receiver of the first may receive the second, but the gold medal will be awarded only to that proposal which, in the opinion of the committee, is the best means of attaining the two objects combined. The particulars can be had of Mr. H. Trueman Wood, Secretary, at the Society's house, John-street, Adelphi, and the models or drawings of structural arrangements and appliances must be sent in not later than January 1, 1880, addressed to the secretary. They must in every case be accompanied by a short description.

We have received the revised catalogue of the ninth Autumn Exhibition of Modern Pictures in the Walker Art Gallery, Liverpool. Among the contributors, we find the names of many eminent artists. In the oil-painting galleries the names of F. S. Walker, R.H.A., James Watt, J. E. Hodgson, A.R.A., Walter Crane, E. H. Barrable, W. Small, A. Elmore, R.A., E. Armitage, R.A., J. O'Connor, Frank Dillon, J. R. Marquis, Prof. G. Coster, E. S. Kennedy, Staniland, Sir F. Leighton. R. O. Bottomley, E. Crofts, A.R.A., H. T. Wells, R.A., J. W. Waterhouse, Miss Thorneycroft, Woodington, A.R.A., Briton Riviere, A.R.A., Goodall, G. F. Watts, R.A., E. Hayes, R.H.A., J. Gilbert, R.A., J. C. Horsley, R.A., and others occur. Rooms V. and VI. are set apart for water-colours. We notice the works of several eminent artists in this school, among them being those of Collingwood, W. P. Grey, D. A. Williamson, F. Slocombe, Townley Green, W. Small, R. P. Spiers, H. B. Willis, J. M'Dougal, Goodall, W. Holman Hunt, J. Ingle Lee, A. P. Newton, F.R.S.A., D. Law, E. Duncan, C. Rossiter, Miss Wratislaw, C. H. Cox, A. L. Haig, F. Lessore, Wormall, Miss Montalba, J. G. Emslie, G. R. Bach, Carl Haag, and several others. The subjects are various, and architectural drawings numerous.

That considerable caution is necessary in the process of pulling down in the metropolis may be gathered from the mishaps that are constantly occurring when, by the removal of adjacent buildings, old properties are left unsupported. In the neighbourhood of Wigmore-street, the other day, we observed that the party-wall of a tenanted, and an apparently well-built modern house, to judge by the front, had bodily fallen into the adjoining vacant space that had been cleared for new premises, and that the floors of the several stories, together with their contents, were precipitated and broken up in the most extraordinary and pitiable manner. Fortunately no lives were lost, and the police soon cleared the adjoining street of traffic. We do not know what the exact cause was of the wall giving way so suddenly, but we were informed it had not been strutted up sufficiently. It often happens that in the clearance and excavation of the ground of new buildings, the party-walls suffer, and we doubt if it is not advisable in many cases of lofty premises so strut the buildings from each other, rendering them mutual support, and avoiding any risk of weakness from undermining. Of course the struts could be removed when the space is being filled up by a new building.

The Cardiff Town Council "carpeted" on Monday a number of builders who were charged with infringement of the regulations by building the walls of houses of a less thickness than the deposited plans. The usual charge was that of building back main walls 9in. thick instead of 14in., and was admitted in each of five cases, most of the builders excusing themselves by saying that others did the same, and they did not see why they should not. A typical case was that of Charles Fox, who was alleged to have built 10 houses in Cecil-street, the back main wall 9in. instead of 14in. thick, the party walls 4½in. instead of 9in., no joists trimmed at the fireplaces, and the bedroom walls over the kitchen 4½in. He said that he had built 300 houses on the same plan. Several of the builders said they did not examine the plans, but they had consulted Mr. Waring, ex-engineer of the borough. After the accused had retired, a discussion took place in the Council as to what should be done in the matter, and on a division it was resolved to proceed against all the builders who had infringed the by-laws, an amendment being lost by which it was proposed simply to caution the offenders and to issue a public warning.

The sixth report of the Commissioners for the Exhibition of 1851 was issued yesterday. In it they mention that Government has taken steps to utilise the site of the exhibition of 1862, which the Commissioners sold at less than half the value on condition that it should be permanently devoted to science and art. They give an account of the series of annual international exhibitions, an account of the completion of the Royal Albert Hall, of the assistance which they rendered to it, and of the means by which provision has been made for its permanent maintenance. Their proposals for the future are, firstly, to erect, with the concurrence of the Government, a building to be used for purposes of scientific and technical instruction, to contain laboratories for study and research, a collection of scientific instruments, and a library of works on science, and to transfer it to the Government on the condition that it shall be used for those purposes; secondly, to place the Government in possession, on very favourable terms, of their permanent galleries; thirdly, to lease to the Government, free of rent, the greater portion of the present Horticultural Gardens as a place of recreation for the public; and finally, to establish a number of scholarships for the purpose of aiding the development of scientific culture and technical training in the manufacturing districts of the country. The commissioners add that the provision now made by the Government for instruction in art may fairly be considered to be commensurate with the wants of the country. For science, however, there is no adequate provision, and they believe it to be their duty to promote its study and diffusion, in a manner calculated to benefit all parts of the country. It is with this object that they have determined to found science scholarships, and have made the proposal to the Government to establish on their estate institutions calculated to promote those studies in science which are so essential to the progress of industry.

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CHIPS.

The Flint town council, at a special meeting held on Monday week, adopted plans by Mr. George Bellis for the rebuilding of the Cornist, Tyddyn, and Maesgwyn bridges, destroyed by the recent floods; and Mr. Bellis was directed to prepare specifications and take out quantities forthwith.

The Ely and Newmarket line, opened on the 29th ult., is 11½ miles in length, and cost £70,000 for construction, not including land. It is at present single. The chief feature is the viaduct by which it crosses the Ouse, just outside Ely. This is of five spans, that over the river being 75ft., and the landward ones on either side being 37ft. 6in. each. The foundations are piles, and the superstructure is wrought-iron plate girders, the centre span being of lattice girders. The cost of this viaduct was £10,000. For the line, Mr. G. Hopkins, sen., of Westminster, was the engineer; and Mr. Waddell, of Edinburgh, the contractor, whose manager was Mr. W. Stone.

The contract for the new lighthouse to be built at Anvil Point, near Swanage, has been taken by Mr. Clarke, of Bournemouth.

A new mansion is being built at Iwerne, Dorset, for Lord Wolverton. On Saturday week about 60 of the workmen had supper at the Talbot Inn. The chair was taken by Mr. Simmonds, clerk of works; and the guest of the evening was the foreman of bricklayers, J. Crane, who is leaving for London.

At the meeting of the York City Council last week, a letter was read announcing that Mrs. Walker would erect in the Guildhall a stained-glass window in memory of her father, the late Alderman Weatherley.

Memorial stones of a new Primitive Methodist Church were laid at Flottergate, Grimsby, on Monday week. The building is Gothic, will seat 1,000 persons, and is expected to cost £4,000. The architect is Mr. J. Wright, of Grimsby; the contract for bricklayers' work has been taken by Mr. Fletcher, of Cleethorpe, and that for joinery by Mr. Doughty, of Grimsby.

The reseating of the church of Fordington St. George, near Dorchester, was commenced last week, from the designs of Mr. Chapman. An unsightly gallery is also to be removed.

During last week the old lightning conductor on the spire of St. Mark's Church, Wrexham, which was recently struck by lightning, has been replaced by a new one. The spire 200ft. high was scaled by long ladders, drawn up by pulleys and securely fastened one to the other. The work was carried out by Mr. W. Hall, in the employ of Messrs. Newall and Co., of London and Liverpool.

The Haslingden Local Board decided on Wednesday week to alter their by-laws, and require the width of all front streets to be in future 35ft., back streets to be 12ft. (instead of 10ft.) and 150ft. square to be provided in all back yards.

The School Board for Thornton-with-Fleetwood last week adopted plans for new schools, prepared by Mr. Seward.

The Visiting Justices of Lancashire considered tenders for the proposed annexe to the county lunatic-asylum at Lancaster, and accepted that of Mr. Ives, of Shipley, near Leeds, at £62,050. The designs were drawn by Mr. Abbott, clerk of works at the asylum, and amended by Mr. Kershaw, the appointed architect. The building is Gothic in style, will accommodate 600 patients, and is to be completed in 1881. In the centre of the block will be administrative department, with entrance-hall leading into a main corridor, right and left, to day-rooms and dormitories. There is a second story.

Cardiston Church was reopened on September 4th. The roofs have been repaired and made water-tight. The pews have been removed from the nave, and replaced by plain open benches; the floors of the nave have been relaid with plain tiles, and the chancel and sanctuary with encaustic tiles by Maw and Co. The work has been carried out by Mr. W. Bowdler, of Shrewsbury; the architect being Mr. Haycock.

Mr. Robert Stephens, ladder maker, of Harrow-road, and Green-street, Paddington-green, has turned out what is described by the *Furniture Gazette* as, perhaps, the longest ladder ever made in England. Its sides are constructed of foreign deals, it has 111 oak rounds, and is about 75ft. long.

The Grand Prix de Rome for painting has been awarded to M. A. Bramtôt; the first second Grand Prix to M. J. S. Buland; the second second to M. E. Pichot. For sculpture the Grand Prix has fallen to M. L. Fagel; for architecture to M. A. Blavette.

The memorial stones of a new Primitive Methodist chapel at Whinburgh, near East Dereham, were laid on Wednesday week. Mr. R. Skipper, of East Dereham, is the contractor. The cost of the building will be £200.

The new post-office at Walsall will shortly be occupied. The style is Italian, and the materials used red brick with stone dressings, and a stone cornice. The total cost will exceed £4,000. The work has been carried out by Mr. D. Moore, from designs by Mr. James Williams, of the Board of Works. Mr. G. Reavell, Birmingham, officiated as clerk of the works.

The foundation-stone of a new church at Highgate, King's Lynn, was laid last week. Mr. Hutchinson, of Huntingdon, is the architect, and the contract for the work amounts to £1,080.

On Thursday week four memorial stones were laid of a new Wesleyan chapel, at Chartham. The chapel is intended to seat 210 persons. The architect is Mr. W. Ranger, of London, and the total cost will be £600. The style is semi-Gothic.

The Paris carpenters struck on Monday for higher wages and shorter hours.

Temporary buildings for the Bristol Medical School are being erected at Tyndall's Park, near the site of the new University College. The buildings are two stories high, and include museum and lecture-room on ground-floor, and two lecture and insection-rooms above. Mr. C. Hansom is the architect; and Messrs. Lewis and Edbrooke, Clifton-vale, are the builders.

The local board of Aspall, near Wigan, have obtained the sanction of the Local Government Board to borrow £9,000 for works of sewerage and sewage disposal.

The City and Guilds Institute having granted £400 per annum for purposes of technical education at University College, London, have resolved that the grant be appropriated in maintaining the chair of engineering and mechanical technology and that of chemical technology.

Additional pumping machinery is being erected for the Bristol Water Works Company at their station in Oakfield-road, Clifton; it has been supplied by Messrs. Simpson and Co., of Pimlico, S.W. The contractor for the new building is Mr. W. Veals, of Bristol.

The Bournemouth Improvement Commissioners last week adopted a new scheme for the drainage of West Cliff district with an outfall at Middle Chine. The scheme has been prepared by Mr. Andrews, the present surveyor to the board, and is estimated to cost £1,600.

The quaint wooden spire of Eltham parish church has been demolished, and in its place a tower of Kentish rag, with Bath facings, in harmony with the new body of the church, is in course of erection.

The services at Canterbury Cathedral now take place in the chapter-house, as the whole of the seats in the choir have been removed to allow of alterations.

A cocoa-house was opened at Willenhall, Staffordshire, on Thursday in last week. It has been altered and fitted up under the supervision of Mr. Baker, architect; the builders were Messrs. Tatlow.

New stables are about to be built for the Wimbledon local board, from the plans of Mr. Mason, their surveyor. The estimated cost is £3,500.

The committee of the Hertfordshire convalescent hospital have accepted the tender of Mr. Ebenezer Lawrence, London, for the erection of a new building on an elevated site at Bopeep, Hastings, at £4,627. The departments for males and females will be absolutely divided, with separate sitting-rooms, but with a dining-hall common to both sexes. The building is intended to accommodate 40 patients.

The Tunbridge Wells and Eastbourne line of the London and Brighton Railway is approaching completion. Mr. Firbank is the contractor, under the company's engineer, and Mr. T. H. Myres, of Westminster, is the architect of the stations about to be erected on the line.

Mr. David Murray, builder and pavement merchant, of Forfar, was found dead in bed on Saturday morning. For many years he was a member of the town council, and latterly occupied a seat on the magisterial bench. The cause of death was heart disease.

◆

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MEETING FOR THE ENSUING WEEK.

Monday.—Royal Architectural Museum and School of Art. Presentation of Prizes by Canon Duckworth. 7 p.m.

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◆

TENDERS.

Bloomsbury.—For rebuilding warehouse premises in Endell-street. Mr. H. W. Budd, architect, 47, Vincent-square, Westminster :—

Fairchild and Co. (accepted).

Ironwork :—

Stanley, Hall, and Co.

Bromsgrove.—For new new schools, for the School Board. Messrs. Day and Yates, architects :—

Mead, S., Birmingham	£4,745	3	0
Kendrick, Worcester	4,391	8	6
Cook and Harris, Bromsgrove ...	4,389	16	0
Bate, Dudley	4,298	0	0
Smith, T., Birmingham	4,297	16	0
Simmons, E., Worcester	4,151	8	3
Jones, C. and Son, Birmingham ...	4,143	16	0
Smith, J. and Son, Birmingham ...	4,115	0	0
Dixon, H. and T., Worcester ...	4,017	16	0
Corbett, Birmingham	3,984	13	0
Read and Amess, Bromsgrove ...	3,907	16	0
Tilt and Fisher, Bromsgrove ...	3,827	15	9
Treewood, S., Malvern	3,777	0	0
Dawson and Bradney, Wolverhampton	3,612	16	0
Vardy and Winter, Birmingham ...	3,590	10	0
Marshall, Smethwick	3,589	5	0
Brazier and Weaver, Bromsgrove*	3,563	10	0
Horton, C. A., Brierly Hill ...	3,404	16	0
Milward's executors, Dudley ...	3,227	0	0
Pritchard and Feltham, Birmingham	3,205	16	0
Widdowson, G., Saltley	3,070	16	0

* Accepted.

Deptford.—For rebuilding the "Gladstone," Lucas-street, Deptford. Mr. H. W. Budd, architect, 47, Vincent-square, Westminster :—

	Building.	Fittings.	Total.
Hobson ...	£1,032 0 0	£115 0 0	£1,147 0 0
Lamble ...	1,037 0 0	155 10 0	1,192 10 0
Anley ...	940 0 0	169 0 0	1,109 0 0
King & Son	910 0 0	153 0 0	1,063 0 0

Dorking.—For house and shop, West-street, Dorking, for Messrs. J. Young and Son. Mr. T. Clowtman, architect. Materials part found. Quantities supplied :—

Putney	£407	10	0
Hamblin, Bros....	405	0	0
Heselgrove	405	0	0
Lynn and Dudley	399	0	0
Goddard and Sons (accepted) ...	388	0	0
Pledge	379	0	0
English	370	0	0

Guildford.—For repainting the town bridge for the Town Council :—

Furlong	£39	0	0
Sturt	30	14	0
Peters	24	10	0
Edmead (accepted)	17	10	6

Hastings.—For the erection of a convalescent hospital for 40 patients, at Bopeep, Hastings, for the Committee of the Hertfordshire Convalescent Hospital :—

Lawrence, E., of London (accepted) £4,627 0 0

Hounslow.—For new infant school at Hounslow. Mr. C. Innes, architect :—

Wheeler, A. and Co...	£2,240	0	0
Gamage, Thos.	1,710	0	0
Collinson, J. F.	1,650	0	0
Stephenson, G.	1,620	0	0
Beale, W.	1,600	0	0
Walter and Reavell	1,545	0	0
Taylor, F.	1,528	0	0
Haynes, H.	1,500	0	0
Jones, D. C. and Co...	1,488	0	0
Raymes, R.	1,473	0	0
Dorey, J.	1,413	0	0
Brunsden, T....	1,400	0	0
Wiles, J. H.	1,345	0	0

Huddersfield.—For building a new church. Mr. I. Brown Norman, architect, Sheffield. Quantities by Mr. W. Hofmann Wood, London and Leeds :—

Smith, Walker, and Co.	£4,000	0	0
Barker, J.	2,987	0	0
Wilson and Stead	2,943	10	0
Kendall, R. H.	2,894	0	0

(Architect's estimate, £2,750.)

Kensington.—For making up the carriage-way of Redcliffe-square, for the Kensington Vestry :—

Mears, J. (accepted) £1,036 0 0

Kensington.—For the improvement of Wright's-lane, for the Kensington Vestry :—

Taylor and Cummings (accepted).

Lancashire.—For the erection of a new annexe to the County Pauper Lunatic Asylum, near Lancaster, for the county magistrates. Mr. Kershaw, architect. Mr. Abbott, clerk of works :—

Ives, of Shipley (accepted) ... £62,050 0 0

[Lowest tender received.]

London.—For proposed new buildings on site of Nos. 26 and 27, Cow-cross-street, for Messrs. Charles and Antony Beckmann. Mr. Thomas Milbourn, architect. Quantities supplied :—

Salmon, W. and H....	£8,850	0	0
Snow and Co....	7,777	0	0
Auley, J.	7,515	0	0
Merritt and Ashby	7,500	0	0
Steed, Bros.	7,360	0	0
Oakey and Sons	7,319	0	0
Jackson and Todd	6,700	0	0
Crabb, G.	6,460	0	0

Long Crendon.—For extension of farm buildings at Long Crendon, Bucks, for R. J. Coltman, Esq. Mr. Horace Jardine Heath, architect :—

Godden, S., of London (accepted).

Northampton.—For alterations and additions at the Northampton Café Company's premises in Gold-street. Mr. William Hull, architect. Quantities supplied :—

	No. 1 contract.	No. 2 contract.
Hart	£978 0 0	... £96 14 0
Cosford	778 5 0	... 61 2 6
Treson	760 0 0	... 60 10 0
Martin	680 0 0	... 66 0 0
Green, E. and H. ...	685 0 0	... 60 0 0
Heap (accepted) ...	662 0 0	... 58 0 0

Southport.—For approaches and iron bridges, for the Joint Committees L. and Y. and W.L. Railways and Southport Corporation. Mr. R. B. Perring, C.E. Quantities supplied by Mr. W. Glendining, surveyor, Manchester :—

Braddock and Matthews, Stockport (accepted).

Southwell Collegiate Church.—For restoring same. Mr. Ewan Christian, architect :—

Shaw, London	£19,955	0	0
Cornish, Norwich	18,934	0	0
Williams, Cardiff	18,718	0	0
Dove, London	18,110	0	0
Thompson, Peterborough ...	17,977	0	0
Escourt, Gloucester	17,872	0	0
Clipsham, Norwell, near Newark*	17,349	0	0
East, Melton Mowbray	15,816	0	0

* Accepted.

St. John's Wood.—For alterations and repairs at 54, St. John's-wood-road, for W. Todd, Esq. Mr. R. E. Pownall, architect :—

Butcher, W. H.	£124	0	0
Tinson, J.	119	0	0
Densham, W.	110	0	0

St. Leonards.—For residence, for Major Tubbs, St. Leonards-on-Sea. Messrs. Jeffrey and Skiller, architects :—

Hughes... ... ... £4,453 0 0

Thaxted, Essex.—For public elementary school for 385 children, for the Thaxted School Board. Messrs. G. Perry and Slater, architects, Bishops Stortford. Quantities by Mr. L. C. Riddett :—

	School buildings.	Master's house.	Playgrounds & boundary walls.	Total.
Ratcliffe, Thaxted	£4,098	£805	£777	£5,680
Davies and Cock, Thaxted ...	3,770	772	928	5,470
Jones and Co., Gloucester ...	3,335	680	1,060	5,075
Glasscock, Bishops Stortford ...	3,300	670	726	4,695
Brown, Braintree	3,070	615	810	4,496

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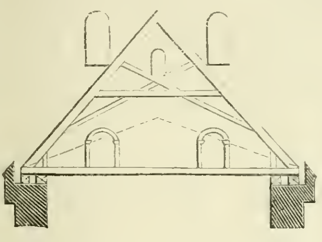
N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION]

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 19, 1879.

SOUTHWELL MINSTER.

A CORRESPONDENCE has lately taken place between the Society for the Protection of Ancient Buildings and the Ecclesiastical Commissioners touching the proposed alterations at Southwell Minster, which would have possessed little interest but for the fact that it in some degree resembles the St. Alban's roof controversy. This time, however, the great professional representatives of conservative restoration have incurred the displeasure of the anti-restorationists by doing, or seeking to do, at Southwell Minster what they protested against being done at St. Alban's; and certain good-natured people are of course delighted at the disagreement, especially as Mr. Christian and Mr. Street are now the defendants. It may be worth while to inquire more fully into the circumstances of the Southwell controversy, to see whether there are any real grounds for the complaints made. First of all, we may briefly recapitulate points raised by the Society as we gather them in the correspondence published between the Commissioners and the Society last year. In April, 1878, the Society for the Protection of Ancient Buildings addressed a letter to the Ecclesiastical Commissioners energetically protesting against certain alterations sanctioned by them—namely, the removal of certain fittings of the choir, the rearrangement of the pews, and the replacing of the present roofs of low pitch with flat ceilings by open high-pitched roofs. For the retention of the roof the Society gave certain reasons, namely, that the proposed alterations, if carried out, would involve the destruction of the present wooden ceilings of the nave and transept, erected after the fire of 1711; that they have an excellent effect, and are more in accordance with the architecture of the church than an open roof, that the ceilings are of oak and perfectly sound, and that any restoration of the high-pitched Mediæval roof must be entirely conjectural. Mr. Morris's letter says—"The Norman nave was in all probability covered originally with a flat roof similar to Gloucester and St. Alban's." The Society assert that the "flat Norman roof" was "replaced in the Middle Ages by a pitched roof; but we have no evidence to show that the alteration was an improvement; but, on the contrary, the subsequent removal of this roof and the substitution of a flat roof tends to show that its effect was not found satisfactory." They further say, "a matter of even greater importance arising out of the contemplated raising of the roofs is the obliteration of the wooden lantern between the western towers, which would be swept away if any other roof is substituted for the present." Unfortunately, the data of the Society are not quite correct; they erred in thinking the Norman nave of Southwell was covered originally with a flat roof, similar to that of Gloucester and St. Alban's, whereas it has been clearly shown by Mr. Christian, the architect to the Commissioners, what the original Norman roof of the nave really was like from the existing indications in the central tower. This error or surmise on the Society's part at the onset much weakened the cause they espoused. Mr. Christian says:—"If Mr. Morris would take the trouble to examine the central tower he would at once see that the original Norman roof of the nave at Southwell could never have been flat, and he would further see that the ancient roof was exactly of the pitch of that which it is proposed to restore, and that there is no evidence whatever of any intermediate roof having ever existed. Hollar's engraving is not sufficiently accurate to stand against the evidence afforded on this point by the building itself." In replying to this part of Mr. Christian's report, the Society say, "As regards the roof of the nave, the Society does not dispute that the marks on the central tower and the moulded arched openings below indicate the former existence of a high-pitched roof, but the timbers of this were in all probability concealed internally by boarding. It *does* dispute the existence of an open roof, meaning thereby a roof the timbers of which were visible from the nave of the church." Now, the first letter of the Society, written by Mr. Morris, distinctly argues on the assumption that the original Norman roof was a flat one; not a syllable appears about the marks or the moulded arched openings in the central tower. In the reply to Mr. Christian the "assumed flat roof" is abandoned, and the Society rather shifts its ground and disputes the existence of an open roof—a point about which not a word was hinted at first. The Society speak of the substitution of the late flat roof for the pitched roof as an improvement, though what great difference there could have been if the latter timbers were concealed, as they now appear to think, it is rather difficult to imagine. The truth is, there has been a rather vague use of terms. If by a flat roof the Society meant a concealed one, they ought to have explained themselves. The sketch of the section of the transept roof, herewith given, will show to any one conversant with old Norman structures that the intention of the old builders was clearly to exhibit the two lower moulded and arched openings, and that a roof of similar framing to that shown by Mr. Christian must have been employed, in which the main rafters are made to pitch between the sills of the two upper and the head of the centre opening, the latter being so placed in regard to height as to become an opening leading into the space above the collar of the roof. The illustration we give shows the proposed roofs of transepts, which in pitch are the same as that of the nave. The dotted line represents the present flat roof. In the nave Mr. Christian proposes a collar-beam with a plain arched rib below springing from the tie-beam. He says, "My own view, and that of other persons interested in the church, is that the substitution of open roofs of massive timbers, covered with lead, such as I propose, would be an enormous improvement to the interior, and would in no way lessen, but rather improve, the external outline of the church." We quite concur in these remarks; the old Norman nave with its flat boarded ceiling has a very depressed effect, and the round-arch clerestory and tower arch look very uncomfortably crowned by the low ceiling. In St. Alban's this effect was mitigated by the introduction of wall-springers. Externally, certainly, the proportions of Southwell demand a roof of tolerably steep pitch. We have taken some trouble to master the question in dispute, and have inspected the drawings prepared by the Commissioners' architect, and we think certainly that the analogy assumed by certain correspondents to exist between the cases of Southwell and St. Alban's is not borne out by facts. In the first place, we rest our opinion on the external evidence afforded by the structure of Southwell itself, such as the marks on the tower of the line of the former roof, discernible now in any tolerably good photograph of the church, and in the arched openings we have already alluded to, besides other minor details, as the projecting courses found at the eaves; and in the next place, we rely upon the architectural proportions of the nave and tower, which undoubtedly require a roof of higher pitch than the present one—a view which is supported by an inspection of Hollar's engraving, dated 1672, which clearly shows a higher leaded roof than the present, with the addition of spires on the western towers. Although the perspective of Hollar is grievously at fault, and the proportions of tower ridiculously narrow, it affords clear evidence that the roofs of the several buildings were steep, and that their lowering was effected after the fire in 1711. The present flat roofs are of an inferior kind of king-post construction; there is a king of timber framed between the principals, and on each side a strut, not properly abutting upon the king-post, but strutted from the tie-beam. Below this the ceiling is boarded and relieved by moulded diagonal ribs of a profile that certainly exhibits its debased origin. There is no doubt that the present roofs were constructed for economical reasons, and to save covering, and although they are not decayed they are leaky in several places. We cannot avoid alluding to the question raised about the so-called "lantern" between the western towers. The Society expresses its hope that the Commissioners "will hesitate before they give their sanction to a proposal which will inflict an irreparable injury upon the church, and deprive it of one of its most interesting and characteristic features." As Mr. Christian shows, this feature—a raised part of the roof bounded by a circular covering outside—was formed for no other purpose than to clear the head of the great Perpendicular window at the west end, for if the low modern roof had been continued it would have cut right across the tracery of the head. The Society have therefore fallen into a most amusing mistake in calling this a lantern and a feature of interest. It is neither; but a clumsy expedient or makeshift the builder of the modern roof adopted to clear the great west window. We cannot think how any well-informed body of archæologists could have called it "unique of its kind," "dignified," and "full of expression," or that it "adds so much to the charm of the church." The Society, by the way, admits the explanation of the necessity of the "lantern" in their second letter, but still desires to retain it, as well as the flat ceiling. While we certainly think the Commissioners are justified in regarding the low roofs as a necessity imposed for the sake of economy chiefly, and that the high roofs would be architecturally desirable; we do not desire to maintain that there exists an adequate reason or a necessity at the present moment for their removal. This point can only be determined from a consideration of the actual condition and circumstances into which we do not propose to enter now.



When we come to the choir fittings the controversy is still clearer. The Society protests against the removal of them and the destruction of the "very interesting side screens," and thinks the rearrangement of the choir unnecessary. The Commissioners, on the other hand, say that they were both "poor" and "inadequate to the requirements of the cathedral service." Mr. Street's opinion was taken by the bishop before the removal of the screens, which were cement copies of the stone screen across the choir, and executed by Bernasconi in the early part of the present century, but very flimsy. We are not sure on what grounds Mr. Street advised the removal of the screens, though we have no doubt he had a good reason for doing so. It has been said that both parties have lost sight of the wooden spires covered with lead which crowned the western towers and chapter house till the beginning of this century. We understand that these features have been considered by the Commissioners' architect, and it is intended to restore them in harmony with the roof, and thus verify again the remark of James I. that Southwell church can "justle with any kirk in Christendom." We cannot agree with the compromise that has been suggested by some, namely, to let the inner flat ceilings remain and to raise the outer roof to the required level. This would have been practicable if the ceilings were really interesting like the painted ones of St. Alban's, but we think the ceiling at Southwell is the least desirable feature to retain; it certainly dwarfs the nave and has no historic or artistic feature to recommend it. The reasons which make the change from a low to a high open roof desirable at Southwell and undesirable at St. Alban's are not so difficult to discover as the Society imagines. Want of knowledge respecting the architectural history and features of the buildings it essays to "protect" strengthens the conviction that the Society would keep on much safer ground if it ceased to give reasons for its interference and stuck to sentimental considerations, which are quite sufficient for the classes to whom it appeals.

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NOTES IN THE NORTH OF LONDON.

THE semi-rural localities in the north of London are fast becoming merged into the general mass of brick-and-mortar. Whichever way the visiter leaves the metropolis he finds what formerly were green fields and meadows partially studded with villas and tenements, or wholly covered by the advancing tide of population. The limits of green pastures are now no longer discernible, in the mazes of roads and streets, as they were a few years ago, and the outskirts of Islington, Holloway, and Kentish Town are fast losing their distinctive features. The class of houses that have arisen in these suburbs may be said to belong to that great and undistinguishable genus which at present covers the largest portion of the suburban districts. The general and prevailing features of them all are, that they are built of stock brick, have stone bay windows carved and incised in a variety of ways, have porches with columns and capitals, arches with imposts and keystones, and are invariably crowned by pierced or ornamental parapets. There is something indescribably monotonous in the repetition of these features, to say nothing of the predominant yellow and dirty drab of the materials used. In the localities of Finchley, Highgate, Crouch End, and Finsbury-park the builders seem to think that a house is not presentable without a bit of stone in the front. We accordingly find all sorts of devices taken advantage of to introduce this material in the cheapest and most showy manner possible. Stone lintels are introduced as window-heads, and made to look like arches, the carver doing his best to enrich its surface with a scroll or spray of foliage. The carved capital and the angle shaft are introduced into the windows or doorways of houses of a certain class. We see scarcely a single instance of good brickwork in these localities, which are given up to the trickeries of the house manufacturer. Curiosity may lead us to go further out, beyond the boundaries of the conventional suburb we have sketched. Barnet, of which there are three distinct localities under the same name, we may cite as an instance of the growth of rural suburbs near the metropolis. Its natural features are certainly picturesque, but they have not been turned to account in the residences. White and red brick predominate, and the square, box-like plan of house is certainly the commonest form of dwelling the visitor sees. Let us just take stock of what is going on at New Barnet. It undoubtedly owes its existence to the Great Northern Railway, which divides the town into two parts. Ascending the hill by the main road from the station, we observe a new stone building on the left-hand side, to all appearances a church. We find it to be a new Wesleyan chapel. It consists on plan of a nave, and aisles, transepts, and tower, with octagonal spire, and an octagon-ended termination to the nave. Externally the walling is of Kentish rag, with Bath stone in the dressings and window tracery. The latter indicates a Geometrical Decorated style. Passing through a boldly-treated doorway, divided into two by a centre shaft, with stone pierced tympanum, we find the aisles are lofty, and have two tiers of windows, indicating a gallery, and are divided from the nave by an arcade of four bays, the arches resting on cast-iron pillars of clustered section, with moulded bases and caps. The windows are of three lights, traceried with cusped quatrefoils; the roof is open and has tie-beam king-posts and arched braces under collars. There is nothing remarkably characteristic about the design, though the work is very carefully executed. Mr. James Weir is the architect, and Messrs. Dove Brothers the builders. A little higher up on the right-hand side another building of a similar kind is in course of erection, intended for a Congregational church. It is in the same state of progress, and is built of Kentish rag and stone dressings in an Early Gothic style. There is a nave and two aisles, but when we enter we find a slight departure from the ordinary model. The aisles are divided from the nave by two wide arches, the central pier of which is of polished marble; two end arches of narrow span abut against the end returns of nave walls. Practically the effect of this arrangement is to give a large and unobstructed area in the centre, a decided advantage over the other and commoner form of plan. Again, the aisle roofs have no clerestory, but run up just below the eaves of the nave roof, the inner spandrels above the arches being pierced by cusped circular openings. The main roof is of timber, open below, and has circular ribs; the walls are finished above in white brickwork moulded in the jambs, and a tower is apparently intended at the entrance end. The aisles are lighted by four lancets in each bay, and the front gable is pierced by a centre traceried and two side lancets. The Communion end is further relieved by a kind of transept gable. Messrs. L. H. and R. Roberts are the builders, and Mr. Harman the architect. These are the only buildings we saw of any architectural character in New Barnet. East Barnet Church is a modern structure of an unpretending kind, with a peculiarly narrow tower at one end, while the Baptist chapel is equally commonplace. On the road to High Barnet the traveller passes some fine scenery that has not yet been obscured by modern building. The old town is as quaint and homely in its appearance as the new one is uninteresting. Only one new building is to be seen in the High-street; it is the new premises of the London and County Bank, built in a sort of modernised Queen Anne in red brick, with warm red sandstone oriel window, and with tile roof and tiled work over the front office windows. It is just opposite the Red Lion Inn. Old Barnet Church is by no means an ancient one, though its flint walls and weather-stained appearance may rather impose on the ordinary visitor. It is in a Late style, with Perpendicular square-headed windows introduced here and there in a somewhat confusing manner. The clerestory, with its anomaly of circular and square-headed windows, is an exceedingly strange admixture, and the only good feature is the massive square tower of flint, chequered with dressed stone, and having a battlemented parapet. Passing through the town, we see a pleasing bit of old red brickwork in a modest row of almshouses, with central pediments of stone, and date 1769. The "Old Salisbury Arms," in the High Street, is another picturesque and genuine remnant of the last century, with its Doric-fronted entrance and its inner court-yard with flat bays. Other fragments of old brick and woodwork may be seen here and there in the street, with its motley grouping of houses in brick and stucco, tile and thatch. In the Manor Road Estate we observe some fine sites on building leases for 99 years, but the buildings erecting upon them are of a very poor and indifferent class. The touch and spirit of modern shams have already obliterated many of the features of this old coaching town. Here and there we see in the old fronts evidences of real honest labour in door-heads, carved trusses, dentil cornices, with their delightfully full mouldings cut out of solid oak, which has stood the wear and tear of a hundred years or more, and yet bids fair to last another century. It is disappointing to compare the modern finishings with them; how meagre, flippant, and parsimonious they look, as if merely put up for a temporary purpose, instead of becoming the outcome and expression of real art interest. Of modern architectural work there is literally nothing, and as in the case of many other old towns, the relics of such work are in the hands of our workmen, who, if even acquainted with the "Five Orders," have no personal interest in giving their labour to an unappreciative public, or to speculators of a mercenary kind.

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RAILWAY-STATION DESIGN.

THE English railway-station has so long been confided to the care of the engineer, that it would be useless to expect any extraordinary degree of taste to be bestowed upon it. We confine our remarks now chiefly to the smaller structures of the class which are erected on our suburban and country lines, and which are generally so designed and arranged as to destroy the natural beauties of the locality, and to inflict upon the landscape a standing eyesore. Although the design of these buildings is generally poor and meagre, it must not be imagined that they are planned with the greatest regard to economy. This by no means follows, and it is the knowledge of this fact which induces us to consider whether the exigencies of our railway system compel the adoption of crude and inelegant structures. To take the average buildings upon our metropolitan lines, we find they generally consist of a long, unbroken brick building, hidden behind a shed or lean-to which covers the platform, and forms, in short, a lengthened and continuous verandah to the metals. The permanent structure behind is often of one and sometimes two stories, without any distinctive features; we might mistake it for a private house but for the telegraph and signal posts with which it is in close connection. There is no attempt to combine the brick and wooden structure—they both appear to be makeshifts, and to have been arranged upon a cut-and-dried plan that leaves no room for improvement, and that has been used ever since the railway system was introduced. The shed or platform roof is supported on a few fancy cast-iron brackets attached to the wall of the brick station or official building, and on a row of attenuated pillars or posts, with rampant brackets springing from caps of vigorously nondescript character. The roofs are of corrugated iron, and the front edge is adorned by a kind of drop-boarded fringe, cut in scollops or some fancy pattern. The description we have given fairly represents the typical railway-station. We note the same kind of building on the North-Western, the Great Northern, the Midland, the Great Eastern, and the North London lines. The Brighton and South Coast, the South-Western and the Chatham and Dover railways possess worse examples of station-building than are to be seen in the north, though a great deal of money has been squandered upon showy brick buildings in the latter case. The merest gangways, with steep breakneck staircases, afford access to or descent from the raised platforms. The latter are dangerously crowded; the entrances and stair "shoots"—we can scarcely call them anything else—that exist on some of these lines are cramped to a niggardly width, and the buildings are extemporised to meet the demands. But we cannot expect much to be done till the railway companies take an interest in making their buildings something better than mere sheds, and a little more characteristic than expensive palaces. Many of the stations on the South London lines have been most extravagantly planned; the booking-offices at some of them are desolate-looking places, larger than the traffic of the district will ever require, while at other places they are absurdly small. We note Camberwell and Loughborough Junction as instances of ill-considered arrangements, with a tasteless profusion of external ornament; both have been as costly buildings as they are disfigurements to the sites they occupy.

If we inquire how it is the railway buildings are so unfortunately planned, we shall be met with the oft-repeated answer that they were designed to meet the necessities of traffic or a locality that has changed. But this does not satisfy the question, how it is they fall so far below other architectural works. It is not difficult. The buildings are arranged and designed upon a set plan; they are the work of the engineer's department, and are hampered by official regulations. The same design is repeated from one terminus to another, and the traveller by rail, wearied by his journey, deplores the mechanical monotony of the stations he passes. There is one way only open to avoid the unsatisfactory design of these buildings. It is competition. A railway company naturally becomes a monopoly; it creates new districts, and serves its own purposes, and it does not care to study the public convenience or taste. If our enterprising railway shareholders were to promote a little improvement in their new stations, a more satisfactory condition of things would speedily follow. Why should not the companies employ their own architects, or invite designs for buildings of this sort? They would certainly get something fresh, if not altogether satisfactory. Iron and wood naturally lend themselves to structures for this purpose, and many new combinations would suggest themselves to the skilled designer. Designs may be grouped into—1, brick and stone, suitable for districts where these materials were plentiful; 2, brick and iron; 3, timber and iron; and 4, concrete and iron. Raised viaduct stations are only practicable in timber or iron, and these might be designed with considerable effect by employing modes of framing the uprights without having recourse to the pillar and bracket. The continuous roof is one of the conditions which war against an artistic treatment of the railway platform, but even this feature could he made less repugnant to good taste if the wearisome edge or valance of wood were done away with and open framing substituted above the upright supports. The "ridge and furrow" roof, that is with transverse gables along the line, might be made thoroughly artistic by the use of projecting gables, and the places for public waiting and sitting might form recesses or bays, instead of being exposed to draught and discomfort under a continuous roof. May not a little more taste be expended upon the platform footbridge also?

Iron and wood have not been turned to the best account in any of the new stations we have lately seen. The wooden buildings are often made to imitate stone ones, with rusticated courses; and the iron is used both expensively and inartistically in the ornamental ironwork and principals. We believe concrete and iron, or concrete and timber, might be admirably introduced in these structures, and afford a large scope for characteristic decoration. To employ high art or elaborate detail in a railway building is a mistake; hence we condemn the elaborate cast spandrels and cast ironwork noticeable in many of our new stations. We do not say that any of our domestic styles, such as Queen Anne, would be in keeping with our railroads; it seems to us a style bordering on Japanese; one light, free, and open, but not fantastic, would be more in character. To attempt to impart a monumental character to a railway station is a singular perversion of judgment and good taste, and we should rather see the engineers' type perpetuated than to adopt any style that has become associated with an age prior to that of the railway system.

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ON THE DISPOSAL OF SEWAGE.

IN the general design of the water supply of towns, and also in that of the disposal of the resulting sewage, there are in each case two opposite principles to be regarded, viz., (1) combination or the aggregation of towns, and (2) their isolation for those purposes; but the first of these principles is much more extensively applicable to water supply than to sewage disposal, while the second is particularly applicable to the disposal of sewage in nearly all cases.

A combination of towns for the purpose of procuring a supply of water may be the right principle to go upon, but in the disposal of the sewage it may increase the difficulties.

In waterworks the element of magnitude is essential in facilitating the carrying out of the works, and in economy, and in the quality of the water; and in all these respects it is especially so where the mode of supply is by gravitation. If we look for a supply of water by gravitation, we must almost of necessity look to distant hills where the ground is but little cultivated, or not cultivated at all. The necessity of a water supply bespeaks population, and in the neighbourhood of populous places the land is unfit for appropriation as a gathering-ground; and it is, moreover, seldom high enough to yield water at a sufficient elevation; so that in seeking to supply towns with water by gravitation, it is generally necessary to go to some considerable distance for it; and this being so, the larger the aqueduct—within range of the limits of practice—the less it will cost per thousand, or per million, gallons of water supplied.

Of necessity, in such a case, private lands are largely interfered with. An Act of Parliament must be obtained sanctioning the construction of the works, whatever quantity of water may be required. The opposition of landowners will probably be as certain for a small supply as for a large one, and the payment required nearly as great in amount. The riparian proprietors must be satisfied in any case, and the extent of the satisfaction is but a question of reservoir room, the cost of which, like that of the aqueduct, does not increase in proportion to the quantity of water dealt with. Magnitude of works, therefore, supplying large numbers of people, is an advantage in this case, providing that sites exist for suitable storage reservoirs, commanding sufficiently large watershed areas. The principle of the combination of towns holds good in all supplies of water effected by gravitation, and in many of those effected by pumping, whether from rivers or from wells.

In the disposal of sewage, that one of the two principles which is proper in any particular case depends upon the mode of disposal: if the object be merely to remove the sewage from the town to another place without consideration of its utilisation—utilisation not for profit, but to render the effluent water of the sewage fit to be discharged into a river or stream—and if it be taken directly to the sea, or to the tidal estuary of a river, combination or the aggregation of towns is an advantage, for in such a case one large sewer may convey the sewage of a combined district to one outfall. On the other hand, there are many advantages in not combining towns for the disposal of large quantities of sewage in one place, but in dealing with it in detail.

It is curious to notice in the reports of meetings on this subject that even yet it is not by everybody understood what sewage is, judging by what people say of it who are elected to positions which require them to talk of it at public meetings, discussing the question as a preliminary to some motion on the subject, and confusing themselves and others by wrong definitions of what sewage is. It is that which flows in sewers simply, wherever it may come from, or of whatever it may consist; the contents of a cesspool are not sewage, nor is the filth swept up from the streets, from markets, or elsewhere.

It contains some solid matter, which is washed into the sewers, and which is kept in suspension in the water, and carried to the outfall by the motion which the sewage has, and which, when the motion ceases, mostly sinks to the bottom, it being only by a sufficiently quick motion in the sewers that it is prevented settling there. A part of the solid matter becomes dissolved in the water, and another part is of no greater weight than the same bulk of the water in which it is suspended, and these two parts are not deposited unless some substance is added to the sewage to carry them down to the bottom. Lime is largely used for this purpose, a portion of lime ground up with water being added to the sewage, agitated by machinery to insure a thorough mixture, and then discharged into a settling tank, where the suspended solid matter is quickly deposited, carrying with it also some portion of the matter dissolved in the water. Lime alone does not effect a complete—or even nearly complete—separation from the water of the matter which is objectionable when discharged into rivers and streams; for the effluent water, although tolerably clear, and satisfactory to the eye, becomes putrescent there; indeed, lime merely hastens the deposition of the mud contained in the sewage. When it is attempted to effect a complete purification in tanks, or, rather, one which will be so nearly complete as to render the sewage legally fit to be discharged into a river, other substances are added, with the lime or before it. Many have been tried; some with success—if we disregard the cost; others with partial success; and some with none at all. Sulphate of alumina is one of the most useful of these substances. The fact is that, at present, sewage does not seem to be worth treating with other than cheap materials, such as the two named. It has a considerable value, chemically, for the fertilisation of land; but it is difficult to bring out its value in practical application. The readiest, most effectual, and altogether the best way of purifying the effluent water of sewage is, after the mud has been precipitated, to irrigate land with it in the same way as water has been used for that purpose for a very long time before sewage was.

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This is one of the difficulties to be contended with in the disposal of sewage in any way other than that of discharging it directly into the sea, or into the tidal estuary of a river; and as every cart-load or boat-load of sand is a difficulty to be dealt with, the quantity should not be needlessly increased by combining towns for the disposal of large quantities of sewage in one place. A moderate quantity of mud may be disposed of for various purposes, whereby its noxiousness is overcome, but it is almost impossible to dispose of a large quantity; and while the area of suitable land for irrigation with the effluent water near any one outfall may be sufficient for a moderate quantity, it is in many cases insufficient for a large quantity, and, at the most, the sewage of but one town should be conveyed to any one outfall. The same principle, indeed, is applicable in the disposal of the sewage of one town, and especially of a large town, where the levels make several outfalls possible without any great difficulty, and where suitable land exists for irrigation with the effluent water. Indeed, the difficulty in some cases lies rather in bringing all the sewage down to one outfall. Many large towns have increased in population and area in a greater ratio than was anticipated when the carrying capacity of the main sewers was decided upon. To relay these of larger size would be a work of great difficulty, and to duplicate them would hardly be possible in many parts for want of room; and the alternative is, where all the sewage must be taken to one outfall, to make overflows on the lines of main sewers for the escape of the excess of sewage when the quantity is more than can be safely carried down to the one outfall, or without rising to such a height in the sewers as to flow backwards up the drains into the cellars of the houses; and certainly this overflowing of sewage is an injury to the rivers and streams, notwithstanding that they may be at the same time in a muddy state from excess of rain-water. Better than this is it to dispose of part of the sewage elsewhere—to increase the number of outfalls.

The ground upon which a town is built mostly lies with an inclination in one general direction, but not so much so as to prevent two or more outfalls for the sewage being procured; and by this means an emulation amongst the various farmers for the use of the sewage may be created. Farmers are timid in trying the experiment of using sewage by way of irrigation, and the opportunities of using it should be multiplied, and not confined to one locality; for if, in the instance of any one town, one farmer begins to use it, the example will probably be followed by others if they have the opportunity, and the voluntary use of sewage on the land around towns, rather than the establishment of special farms of large extent in one locality, is most likely to meet all the requirements of the case.

The chief difficulty in thus dealing with the sewage of a town at several outfalls is, that the owners of land in any situation near a town refuse to sell it at its agricultural value, or to let it at the current rent. In all probability—that is to say in almost all cases—the owner of land near a town has contributed absolutely nothing to its increased value; this has been created by the necessities of the townspeople, and yet they are deprived of the natural use of land for the disposal of their sewage, unless they consent to pay for the land to an external person the increased value which they have themselves created.

Wherever the Local Government Board approve of the situation and area of land proposed to be taken by a sanitary authority, for irrigation with the effluent water of town sewage, it ought to be transferred to the possession of the sanitary authority of the town, at its agricultural value; and, moreover, with regard to residential injury, much of the nonsense now allowed to be pleaded in that behalf, on surmises of what might possibly occur under some shadowy and most unlikely circumstances, should not be heard.

As to objections on sanitary grounds to the irrigation of land with the effluent water of sewage near a town, there is an abundance of evidence in the country that those objections have no foundation in truth. The instances in which this can be proved by evidence are mostly those where a moderate area only is irrigated in one situation, thus giving play to the oxidising influence of the atmosphere on the irrigated land; but even where a large area is irrigated in one situation the objections rest only on surmises.

The interests of townspeople have suffered more in respect of the disposal of their sewage than in anything else, the aim of which is the amelioration of the evils of town life. Time after time the sanitary authorities have tried to obtain land for irrigation, or for the purpose of filtering through it the sewage of towns, or rather the effluent water of the sewage, and mostly without success, until they have become so much discouraged that the first refusal of the landowners to enter into negotiations is sometimes sufficient to turn them from the subject altogether, and to throw them back upon the makeshift modes of disposal we see in so many places.

Each successive Government has been much to blame for many years past in not insisting upon land being readily transferred to the possession of town authorities for the proper disposal of the inevitable sewage. The Legislature has never fairly faced the difficulty; the utmost it has done has been to permit the application of an Act—the Lands Clauses Consolidation Act of 1845, with its amendments of 1860 and 1869—to the taking of land for the disposal of sewage in the same way as if it were required for a railway or other commercial purpose; but the two purposes are dissimilar in their nature, and should be regarded differently.

NATURAL AND ARTIFICIAL CONCRETE.[*]

MR. HENRY REID, the author of the "Science and Art of the Manufacture of Portland Cement," reviewed in these pages two years ago, has just published a new edition of his work on concrete, in which the subject in its varieties and applications are treated of more fully. It will be conceded by all practically conversant with concrete that its manufacture has largely developed of late years. Marine architecture, paving, and pipe-making alone have afforded large opportunities for the improvement of this material. Mr. Reid has taken advantage of all the sources of information available, and, aided by his thoroughly practical knowledge of concrete-making and Portland cement, has produced a treatise that will be found of great interest and value to the engineer and architect, as well as the general manufacturer and builder. A few sensible observations are made in the preface. The author says:—"In the best examples of concrete of established quality, I have shown that much of their excellence is due to the care bestowed on their fabrication, and a just and intelligent knowledge of the matrices and aggregates of which they are composed." We can only glance very generally, in the present notice, at the principal parts of Mr. Reid's book. In the introduction the dangers of indiscriminate use of natural stones are pointed out, the terms "béton" and "concrete" are defined, and the value of scientific combinations of materials urged. The conditions of good concrete are next discussed, and the defects of modern concrete considered. Chapters III. and IV. treat respectively of "matrices" and "aggregates," the two components, and their amalgamation. Chapter V. describes the machinery for reducing the aggregates, such as stone-crushers. The processes of concrete manufacture, such as Coiziet's, béton aggloméré, Ransome's, and other methods in use, are dwelt upon at some length, the English concrete industries forming an important chapter. Next follow the constructive applications of concrete, which will be read with interest, particularly by the architect, after which we have descriptions of important engineering works in which concrete has been employed, such as the Tay Bridge, the River Liffey Improvements, the Birkenhead Docks, and considerations as to testing, &c. We can now merely dip here and there into Mr. Reid's treatment of these subjects. The chapter on machinery for reducing the aggregates is fully illustrated by the various forms of crushers, rollers, squeezers, impactors and abraders, and the peculiarities and advantages of each kind are pointed out. A very important point is enforced in treating the aggregates. The author observes, "it will be necessary not only to reduce the rock from which the aggregate is obtained by the proper mechanical appliances, but even after its reduction to be careful that all dust arising from fracture is effectually eliminated. . . . . Fine or impalpable dust produced from the mechanical and rapid fracture, especially of crystalline rocks, coats or covers the broken pieces with fine dust, thus interposing between their surfaces and the cement, preventing thereby the beneficial action of the latter." The author observes that the operation of cleansing should be subsequent to, and independent of the reducing process in granite more especially. Speaking of the size to which aggregates should be reduced, the author advises the maker to take Nature as a guide. The hardest natural stone is the finest grained. It follows that aggregates from the size of a carraway seed to a hen's egg are suitable, provided the proper proportions are attended to. In rough concrete blocks for sea-walls, &c., the size and shape are matters of indifference, so long as small sand or gravel be used to fill up the interstices. Fractured aggregates, angular in character, are more likely to become compacted than round gravel. A clean aggregate, freshly broken, is insisted upon, and the value of using well-washed materials is known to engineers in charge of harbour and dock works. Sir John Coode, who has had great experience in concrete works, strongly urges the importance of cleansed aggregate. The rubble stones used for the large concrete blocks in Douglas Harbour, Isle of Man, were carefully scrubbed with a brush and water before being used. Porosity or roughness is also a desirable condition of an aggregate. The great advantage of concrete for pipe-making is forcibly dwelt upon by Mr. Reid, and we notice he furnishes the reader with

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[*] A Practical Treatise on Natural and Artificial Concrete, &c. By Henry Reio, author of the "Science and Art of the Manufacture of Portland Cement," &c. London: E. and F. N. Spon, Charing-cross.

details of the experiments carried on at Bournemouth to test the strength of concrete and stoneware pipes, of those conducted by Mr. Ellice-Clark, surveyor to the Hoye Commissioners, and also with the opinions of Mr. Baldwin Latham, the latter of whom says that 21-inch concrete pipes should be made at least 2in. thick. The author observes that the engineer intrusted with the execution of sewer work should be fully able to test the mechanical strength of his pipes, and that the manufacturer should be only responsible for their resistance to chemical action. No engineer will be disposed altogether to deny this responsibility, seeing that the filled-up trenches often exercise an abnormal strain upon the pipe, the pressure being frequently irregular in its action, and not altogether a simply compressive one in all directions. Mr. Clark's experiments distributed the pressure uniformly by packing the sides in clay, but this condition is not, we may observe, always present. "Under any circumstances, either with the silicating process or without it," says Mr. Reid, "pipes exceeding 15 inches diameter should be at least four months old before being used. "The sewerage pipes produced by Messrs. Hodges and Butler, and others, are mentioned, and sectional engravings of egg-shaped sewers constructed in segments are given. The main consideration in concrete sewers is a good flat foundation, and a surrounding of concrete to resist horizontal pressure or thrust.

The author dwells at some length on the constructive uses of the material for house building. Mr. Lascelles' slab or tile method, a system already known to our readers, is fully described, and this chapter is illustrated by a Queen Anne House, erected in the "Street of Nations," at the Paris Exhibition, by Mr. Lascelles, designed by Mr. R. Norman Shaw, R.A., showing the adaptation of concrete to the production of architectural design. We illustrated the elevation of this house. A studio window at Kensington, designed by Mr. N. Shaw, and executed by Mr. Lascelles in which concrete is substituted for wood frames is also one of the illustrations, and the author refers to the published work of the last gentleman. We do not wish to enter here into the vexed question of the artistic adaptability of concrete; there is much to be said on both sides: but for ordinary building purposes it has undoubtedly a great future open for it, if judgment and the discernment of correct principles of design are brought to bear upon the subject. As we have said on more than one occasion, the use of concrete for architectural purposes will mainly rest upon the moderate taste and good sense of the profession, and we think the designs given in Mr. Reid's book scarcely furnish the best models. We believe in concrete architecture, but we also think that it should be controlled by conditions different from those which governed the picturesque buildings of our own country. In the other applications mentioned, such as those of concrete mosaic tiles for paving, illustrated by Mr. Waterhouse's design for the pavement of the Manchester town-hall, executed by Messrs. Patteson of that city; and for fire-proof floors, such as Hornblower's system, hollow wall building, &c, we heartily go with the author; but we stop here, and defer our remarks on other chapters for the present, saying in conclusion that Mr. Reid's treatise is by far the most comprehensive handbook yet published on concrete and its capabilities, and we can recommend it with confidence to those who are not too blind to the undoubted merits of the material, or to recognise its future employment.

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The church of St. Michael, West Felton, near Oswestry, was reopened yesterday (Thursday) after restoration, including the rebuilding of the arcades, at a cost of £2,000.

LAYER MARNEY.

THE wars between England and France in the 15th century, added to the civil commotions in each country, prevented much progress in society and the arts. Nevertheless, encouraged by the well-known policy of the early Tudors in abasing the hereditary aristocracy, the lower and middle classes had reached a pitch of development which their condition rendered impossible before. Early in the 16th century this progress was very rapid. Henry VIII. having succeeded to the hoards of his father, and shortly afterwards to be gorged with monastic spoils, could heap wealth and titles upon the smaller country gentlemen for the purpose of humiliating the *haut noblesse*. The natural consequence of this was that we find these "new men" converting their manor-houses into stately mansions, and vieing with the old nobles in magnificent display.

The introduction of the new style of architecture—half Gothic, half Classical—was due in a great measure to the presence and popularity of Holbein and other foreigners at the Court. The porch designed by the artist-architect at Wilton is a very favourable specimen of the style then growing into favour. Henry VIII. had also in his employ an Italian architect—John of Padua—who was called *Devisor of his Majesty's Buildings*. His predecessor in the post was Girolamo da Trevigi.

English architects—or foreigners employed by English monarchs—have generally been quick to adopt novel ideas from abroad. For example, in the middle of the 15th century a new style of civil architecture was much practised in the dominions of Philip the Good, Duke of Burgundy. It may be still seen in his palace at Dijon, and the Hall of Justice and Maison de la Pucelle at Rouen. A good deal of intercourse then took place between Flanders and England, and there can be no doubt that this Burgundian architecture had much to do with the development of the Tudor style in this country.

Harrison, in his "Description of England," p. 330, calls Henry VIII. "the onlie phœnix of his time for fine and curious masonrie." When such a monarch led the fashion it is not wonderful that his courtiers willingly followed. Wolsey showed his ideas of magnificence at Hampton Court and York House; and Thornbury (Gloucester), built by Edward Stafford, Duke of Buckingham, Grimsthorp (Lincolnshire) by the Duke of Suffolk, Kenninghall (Norfolk) by the Duke of Norfolk, Mount Surrey (near Norwich) by Lord Surrey, attested the architectural splendour of the time. Many other examples might be given.

The ground plan of houses built during the first half of the 16th century did not differ much. It is given in a curious work called "A Dyetorie or Regiment of Health, by Andrew Boorde of Physicke, Doctor," first printed in 1547, under the heading, "Howe a Man Should Build his House or Mansion." The author says, "Make the hall of such a fashion that the parlour be annexed to the head of the hall, and the buttrye and pantry at the lower ende thereof; the cellar under the pantrye sette somewhat at a base; the kechyn sette somewhat at a base from the buttrye and pantry; coming with an entrie within by the wall of the buttrie; the pastrie house and the larder annexed to the kechyn. Then divide the logginges by the circuit of the quadrival courtes, and let the gate-house be opposite or against the hall doore; not directly, but the hall doore standyng abase of the gatehouse, in the middle of the front enteringe into the place. Let the prevye-chamber be annexed to the great chamber of estate, with the other chambers necessary for the buildinge, so that many of the chambers may have a prospecte into the chapell."

The more peaceful nature of the times materially aided the development in architecture. Moated castles or fortified manor-houses were no longer required, and therefore superb gatehouses, large bay windows,* and a quadrangular plan could be indulged in without danger. The spread of knowledge and the taste for art allowed the architects of the period to enrich their compositions with medallions and mouldings of moulded brick or terra-cotta. Chimneys of quaint design rendered even small houses characteristic and picturesque.

In Layer Marney Hall, Essex, we have a building of the greatest interest. It is one of the earliest—if not the earliest—16th century buildings in which terra-cotta appears, and other features of the Italian revival. The Marneys, at the accession of Henry VIII., were a family of a class described by that monarch as "scant well-borne gentlemen of no great lands," and which he specially delighted to honour. He was not, like many of Henry's favourites, taken from a very humble position and raised to wealth and power. His family took a good position in Essex, and resided in a comfortable manor-house. Sir Henry Marney (afterwards the first Lord Marney) held an office in the household of Margaret, Countess of Richmond, mother of Henry VII., and in her will, in which he is styled "Chancellor of the Duchie of Lancaster," he was appointed one of her executors. It is said that Prince Henry (afterwards Henry VIII.) specially requested his father to make him one of his privy councillors. Dugdale, in his "Baronage" (II., 301), states that Sir Henry "was a person of great wisdom, gravity, and of singular fidelity to that prudent prince King Henry the 7th; was made choice of for one of his Privy Council in the first year of his reign."

On the accession of Henry VIII. he made Sir Henry, one of his Privy Council, a Knight of the Garter, and Captain of his Guard. He had important grants of land, particularly from the estates forfeited to the Crown by the treason of the Duke of Buckingham. There seems to have been a quarrel between him and Cardinal Wolsey. Talen, in a letter to the Earl of Shrewsbury, says, in 1516:—"Her (at court) is gret snerling among dyse of them yn so moche my Lorde Cardynall sayd unto S^r Henry Marny that the same S^r Henry had done more displeasure unto the Kyng's Gce by reason of his cruelnesse agenst the gret estates of this realme than any man lyvinge."* The next year he wrote:—"My Lord, as far as I can her, y^r Lordship is moche beholdeyn to my Lord Cardinall for his loving words, and that mvelleously now a la^{t}e daies, sens the varens was betwixt his Gce and Sir Henry Mny."

Lloyd in his "State Worthies" (1766 I. p. 159) observes of Sir H. Marney—"Industry and thrift over-rules princes: this personage had no time to transcribe intelligence, but what he borrowed from his sleep; nor money to buy it but what he saved out of his allowance; yet he understood moer than any one prince in Europe, and was moer consulted than any one statesman." It is probable that Sir Henry was a bit of a diplomatist, for "he would say that he that could not with the cameleon change colour with the aire he lived in, must with the cameleon live only upon aire." In 1522, Sir Henry was one of the leaders in the army which invaded France, and for this and other services he had his reward for—"the xij day of Aprill, in the yere of our Lord A.M. v^{c}xxiij, in the xiiij yere of Kinge Henrye theight, was S^r Henry Marney created barron Marney at the King's palace at Richmonde, being led by the Lord Ross and the Lord Fitzwater, and the Lord Montjoyce bering the robe, having ij *barres of lectucs*. Don in order as before in other ys more at large declared." (Add. MSS. 6113, fol. 127).

It was this Lord Marney who determined to build near his manor house at Layer Marney, a mansion more suitable to his increasing importance. It is very uncertain when he commenced it. The range of buildings to the east of the great gateway, is decidedly older than the other portions of the edifice, and was probably begun early in the reign of Henry VIII. It is in the Gothic style, and we should conjecture that as the work proceeded, and Sir Henry became acquainted with the Italianised Gothic then becoming fashionable, he determined to erect the superb gateway and the wing joining it on its western side, in the new style. These buildings were partially carried out by him, and continued by his son John, Lord Marney. But the gateway with its eastern and western wings, were to form only the southern side of a great quadrangle of about 100ft. square. The other three sides of this court were never completed, but from the unfinished state of the ends of the parts erected, the nature of the plan intended is perfectly clear.

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* These bay windows may be considered a development of the oriel windows of an earlier time. The use of the bay windows at the upper end of halls appears from a MS. in the Herald's College. Speaking of a feast given by Henry VII. in the hall of Richmond Palace, the writer says;—"Agaynst that his Grace had supper, the hall was dressed and goodlie to be seen, and a rich cupboard sett thereup in a bay window of IX. or X. stages and launces of light, furnished and fulfilled with plate of gold, sylver, and regilte." Carved oak wainscotting became general in halls.

* Lodge's Illustrations, I., 18.

Henry, Lord Marney*, did not live long after his elevation to the peerage. He died May 24, 1523, and was succeeded in the title by his son John. Very little appears to be known respecting the second Lord Marney. He married Christiana, daughter and heir of Sir Roger Newburgh, and had two daughters, Catherine (who married first George Ratcliff, and then Lord Poynings), and Elizabeth, who married Lord Thomas Howard, son of Thos. Duke of Norfolk, created Lord Howard of Bindon. Lord Marney's second wife was Bridget, fourth daughter of Sir William Waldegrave, widow of Thomas Finderne, of Little Horkesley, but by her he had no issue. John, Lord Marney, died April 27, 1525, or within two years after his father, leaving no male children, and thus the hopes of the Marney's in founding a great family with a residence suited to their rank and fortune, became extinct. The new mansion never was inhabited, it not having been in a state complete enough to induce the Marney's to leave their old manor house. It is probable that they spent little time in the country as, in those times of political intrigue, a prolonged absence from Court was dangerous.

Enough remains of what would have been a splendid mansion, to show the taste of the owner or owners, for as we have before remarked, it is impossible to tell the relative parts taken in its erection by the two Lords Marney. The oldest portion of the building eastward of the gateway, is a good example of the Latest Tudor architecture. The upper story of this range appears to have been divided into dormitories, and the whole range was probably intended for the use of the retainers of the family, always numerous at that period. The largest of these upper-rooms is very like the dormitory of a monastery.

The central gateway, as was usual at the period, was the most conspicuous feature of the pile. It is called the "Tower" by the people of the neighbourhood, is a very stately composition about 70ft. in height, and divided into eight stories. Good effect is produced by placing octagonal towers at the southern corners, and these would have formed very convenient antechambers for pages, and other purposes. Two fine rooms were obtained by using the interior space of the tower between the turrets. Access to these was obtained by a capital newel staircase, or by communication with the apartments of the western wing. As it appears, from indisputable evidence, that the sides of the quadrangle were intended to be of the same height and character as the western wing (which is now the only inhabited part of the structure) that portion will be examined with the greater interest.

In all quadrangular houses of this period the most important windows looked into the courtyard and lighted a corridor or gallery, which afforded means of access to the various rooms. The latter appear to have had their light from smaller windows, in the exterior. The rooms in this western wing have many of their old features little altered. The old panelled ceilings remain.

Red brick—frequently moulded—is used for the structure throughout, but Mr. C. F. Hayward, in a very interesting paper on the building in "Transactions of the Essex Archæological Society" (III., p. 25) points out that debased notions were coming into vogue, for the brick jambs of the windows have been covered with fine plaster to imitate stone. This has now peeled off, exposing the unworthy sham. The *reality*, which was one of the most characteristic features of Gothic architecture, was going out of fashion.

As before noted, the most interesting feature of the whole building, with the exception of the Gothic or eastern wing, is the employment of terra-cotta as a means of enrichment. It is a curious fact that a tradition still exists in the neighbourhood that the Italian workmen employed for the purpose worked with clay found near the Hall. The terra-cotta was used for the decoration of the mullions and other parts of the windows in the western wing, and for the parapet of the great gateway. The latter is very artistic in character. Dolphins support tablets inscribed "M. C.", joined by a knot, the initials doubtless, of John, Lord Marney, and his wife Christian, daughter of Sir Roger Newburgh. This appears to show that the gateway was completed in 1524, before the decease of his first wife Christian and his second marriage with Bridget Waldegrave.

In the fourth volume of the "Transactions of the Essex Archæological Society" (147-163) Mr. H. W. King gives the long and elaborate wills of both Lords Marney. It is almost impossible to over-estimate the importance of these sources of information to the archæologist and genealogist, affording as they do most minute accounts of the goods of the testator and family connections. We turn to the wills of the Marneys for the purpose of throwing light upon the construction of the mansion. In this we are disappointed; the works then in progress are not mentioned by either father or son. The wills contain, however, such interesting allusions to the usages of the period, that we shall make a few extracts from them.

Henry, Lord Marney, "being hole of mynde and parfite memory," bequeaths his body to be buried "in the chauncell of leyer Marny Church, where diverse of myn auncestours lyez;" and gives "to ev'ry places where I am made a brother under their seall iij^{s}. iiij^{d}." It was not an uncommon thing for wealthy men to become nominal brothers of monastic houses, and they could, if they pleased, be buried in the conventual habit. The following throws light upon the date of a portion of the church:—"I will that with the profits of all my said lands that the chapel which I have begon, adioynyng to the chauncell of the parish church of leyer Marny, be new made, and fully fynysshed, according to the same proporcions in length, bredith, and heith, as it is begon, with a substantial flat Roofe of Tymber, and also with the profit of my said lands that myn executors cawse to be made a Tumbe of marbull, to be sett in the wall betwixt the chauncell and the said chapell, which wall I will it be newe, and to be vawted over w^{t} marbull, and workmanly wrought w^{t} suche works as shal be thought convenient by my executors, and my Image to be made of black marbull or Towch, w^{t} everything convenient and appurteyng to the same." He also ordered his executors "contynually for ever fynde twoe good and honest prests, being of good conversacion, *and also such as do understand what they reed*, that they or every of theym say masse daily in the chapell aforesaid, unless they be seke, or diseased, or som day not dispoased." Lord Marney knew that many of the priests were grossly ignorant.

John, Lord Marney, in his will dated March 10, 1524-5, and proved June 28, 1525, bequeaths his "body to be buried in the newe Ile in the north side of the parishe churche of leyer Marney, in the meddes of the said Ile, directly agenst the myddes of the newe chapell, six foote from the peticion between the chapelle and the Ile, in a vawte of bryke, to be made so large that two bodies may be leyd therein, over the which vawte I will there be a Tombe sett, and made of suche stone as my father's is made of, yf it may be gotten, or ells of graye marbul, the which Tombe I wil shal be eighte foote long, and fyve foote brode, and four foote high, *and to be wrought in every condicion as my father's Tombe is*, except the vawte over and above my father's said Tombe, and the arms aboute the Tomb I will to be changed after the device of the harrode." The passage we have underlined shows the great importance of these wills to elucidate disputed architectural facts, for Mr. C. F. Hayward, in the paper before mentioned, conjectures that the second Lord Marney erected his father's tomb, in deference to his taste, in the Italian style, but that his own tomb indicated that he (Lord John) preferred the Gothic style. His will shows that he expressly wished his tomb made like his father's.

He ordered to be placed round his tomb "a grate of waynscott, and at every corner of the same grate a principall pyller, w^{t} a white lybard upon the topp thereof." These pillars, with their surmounting leopards, have been taken from their former place, and erected near one of the more modern pews, their use often having been questioned. He goes on to request that "at the east ende of the said Tombe I will there be made an awter, where I woll have a preest synging for me perpetually, after such orden'ces and devices as here in this, my present will, here after I have showed and declared." This altar of terra-cotta remains almost perfect, and is an extremely valuable example of the revived architecture. He gives to his "wife hangings for two chambers, of tapestry, which be now appoynted *for the Pew lodgings in the new gallery in the west side of the Tower.*" This is interesting, both as mentioning the new building, and also calling the gateway by a name by which it has been popularly distinguished.

The following is also interesting:—"I will that myn executors prepare, ordeyn, and cause to be made of oon hundred pounds of plate, or money, three paire of basons, three paire of candlesticks, and too paxes, three paire of cruetts, three sacrying bells, and oon chales; whereof I will and ordeyn that oon paire of the said basons shall remain *unto the said chapell room (in) my said place of Leyer Marney.*" This is very important, as it shows that the whole of the old manor house, or a portion of it, was then in existence, and that it was not to be destroyed. The plate is to *remain* in the chapel; which, with other portions, probably, of the old house, were, perhaps, to have been incorporated with the new buildings.

We will make one more extract from the second Lord Marney's will, to show what became of the rich costumes of a nobleman of that period. "I will that myn executors do cause to be made of my gownes of silk and velvet oon vestement (chasuble) for the new chapell on the north side of the chauncell of the said churche of Leyer Marney, and two vestments for my chauntry awter at the end of my said tombe; another vestment for the chapell w^{t}in the place, and oon vestment for the high awter of the said churche. The residue of all my gownes of silk and velvet I will that vestements be made of same and given to pour churches in the countre, where most need is. All my other gownes of clothe, coats, jacwets of silke and velvet I give to myn executors."

After reading these extracts, it is interesting to turn to the parish church, where—

> "—— the Lords of Marney lie
> In their stately canopy.
> There they slumber, side by side,
> Dreaming of their ancient pride,
> When in old ancestral power
> They dwelt within their stately tower."
> —*Mitford.*

Three tombs of the Marneys are worthy of careful study. The first of these is a first-rate example of the Perpendicular period. It commemorates Sir William de Marney, High Sheriff of Essex and Herts in 1402, and grandfather of the first Lord Marney. He died in 1414, and his tomb consists of an alabaster altar tomb with traceried panels, on which rests his effigy in the armour of the period, sculptured in white marble. Between the chancel and the eastern portion of the north aisle is the terra-cotta altar tomb of Henry, Lord Marney, supporting his effigy clad in the robes of the Garter. A canopy of terra-cotta, richly ornamented, adds dignity to the whole. In the western part of the north aisle appears the tomb of John, Lord Marney, with its probably unique terra-cotta altar. All the Gothic details were carried out, in all probability, by the same workmen who executed the details of the mansion. Altogether, the hand of Time has dealt leniently with the house and tombs of the Marneys, and the spot forms an extremely interesting one, about which we have often lingered, thinking, with the poet, of the old "tower,"

> "With what a pensive brow it looks
> On the fields and on the brooks,
> As it would recall its prime,
> By gathering thoughts from elder time."

BEER.

THIS is no homily on beer-drinking, but simply some account of Beer in Devon. Beer lies towards the eastern extremity of the south coast of Devonshire, and some 20 miles from Exeter. Down upon the shore, close by where that winding home of the salmon and the trout, the badger and the heron, the River Axe, not the Exe, remember, which is a score of miles away—pours forth her waters into the English Channel, lies the little town of Seaton. A mile westward of Seaton is Beer; but although so near, yet so curiously is the latter nestled in a comb-down between high headlands, that no stranger would dream of the existence of this animated little hive of human fisher life until he was right upon it.

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* Lord Marney, when Sir Henry, married Thomazin daughter of Sir John Arundell, of Larnherne, in Cornwall.

A charming walk is the one from Seaton to Beer; but Beer-head intervenes between the two places, and the pedestrian soon finds that the perambulation of Devonshire lanes, when they wind over Devonshire headlands, means "collar-work" with a vengeance. And yet, in the wealth of rich foliage that springs up everywhere in wild and luxurious *abandon* one is amply repaid. Look at the ferns, and say if ever you saw finer or rarer ones. We climb by a winding path, until we reach the top. Here is a view of land and sea, if you like! Sit down upon the soft mountain grass, and whilst we rest we will look around.

Down beneath, many hundred feet below, the big breakers that roll in from the blue sea come tumbling along, one after the other, and with a thud and a bang, up they go, scattering clouds of spray, upon which the bright sun's rays dazzle, and form a score of miniature rainbows. The limestone rock whereon we rest stands bleak-looking and bold through all this; and the sound of the retreating waves on the shingle comes up with a continuous rumble and roar. There, in the valley, is the old tower of Axmouth Church, and, nearer still, that of Seaton, whilst further behind, in amongst the trees, are seen the towers of Colyton and Shute. Down, down, we go, and here we are—almost before we know it—in Beer itself.

Look at the quaintly-dressed fishermen, the cherry-cheeked girls—making delicate Honiton lace upon "pillows" at every door-step, the orchards and the apples' peeping out at one from between the houses. Water, pure and crystal-like, runs down the roadway. Beer consists of one straggling street only, and, at as many intervals, are three Italian-like conduits, from which water for domestic purposes is procured.

Beer Church is a large and fine one, built a year or so ago, from Messrs. Hayward and Son's designs, at the cost of the Hon. Mark Rolle, who owns the estate. It is a pleasant building, having a square spire, very much after the fashion of those we find in the Channel Islands. The walls, in the main, are blue limestone, but all the dressings are of a white sort of stone, looking very like a cross between Bath and Caen. This is the Beer stone—a material largely used in the West of England in the middle ages, but which for many years has fallen into disuse; not because the quarries were dug out, nor because better stone was in the market, but simply, I take it, from lack of energy. I hear that the ownership of these quarries has fallen into fresh hands, and I believe that if they will work it with anything like ordinary spirit, a very excellent working stone, now little known, may be brought into the market with success. But eschewing business altogether, the Beer quarries are so curious that they are well worth a visit. Situated a mile or so inland from the sea, they have historical associations of no little interest. It was from these very quarries—or mines one is inclined to call them, for they burrow tunnel-like into the earth—that the stone was procured for Exeter Cathedral.

I had an opportunity of going over these quarries recently, thanks to the kindness of Mr. S. Staple, the company's resident manager. From him I gathered some useful information, which, whilst fresh in my memory, it may be well to jot down. The entrance to the Beer quarries is by three low tunnel-like openings in the side of the cliff, reminding one not a little of the approaches to the celebrated Cavern at Castleton in Derbyshire. Armed, each of us, with a candle, we pierced the gloom within and began a perambulation of the many tortuous windings the workings assume. The bed of the stone runs pretty level, so no steep inclines exist. Its course has been followed into the hill side for over a quarter of a mile, and the quarried portions cover an area of some ten acres. The quarries are quite dry, save that here and there a vent in the stone may occur—a "chaffer" the quarrymen term it—and at such places the clear crystal like water trickles down. Those of us who have descended deep coal-mines know how oppressively hot the atmosphere of these grim regions are. This is not the case in the Beer quarries. There the temperature, I learn, keeps the same in summer and winter. The greatest depth reached below the ground is 300ft. It does not appear that the hewing and quarrying of the stone underground is at all detrimental to health. One of the men told me that he had worked there for forty years—a long time for a worker of stone to work anywhere, over or underground. At least, those who work above ground, in the common course of things, are generally sent below—and permanently—long before that! The quarry men work "by the piece" as a rule, eight hours a day constituting about the average time of labour. They provide their own tools, which consist solely of a pick ("peckice" they call it), and hammers and wedges. The pick is a single barbed one, the old original implement, indeed, which the men's forefathers for generations have used. They earn, on an average, a guinea a week. When working daywork the masons receive 5½d. an hour; the quarrymen 4d.; and the labourers and sawyers 3½d. The pick hews into the stone very readily, but, at best, it is hard, or in Devonshire phraseology "spare" work, chopping away all day long in the dark tunnel by the grim light of a few candles stuck in lumps of clay against the walls.

In some places the Beerstone bed runs 17 or 18ft. deep, in others, not more than 12 or 13ft. To support the roof, pillars of stone, each some 25ft. square, are left here and there, the stone being quarried away quite perpendicularly all round them. The bed above the Beerstone is of a chalky character, intermixed with flints. This is first blasted and worked off to the height of about 3ft. above the topmost bed of the Beer. This done, the quarryman "picks" a 6in. "curve" out at the side and back of the block to be raised. Wedges, 7 to every 5ft., are then driven in, and the stone loosening, it is tipped with a bar. The confined state of the tunnelling not admitting of cranes, &c., all the blocks have to be moved afterwards with jacks and rollers. Horses go in and out the whole distance. It takes four horses to pull four tons underground.

The stone itself runs in four beds. Two are about 4ft. deep, and the other two a little less. The second one seems to be the best, being quite free from the least sign of a knot or pinhole. The blocks quarried average 3ft. 7in. by 5ft., and the stone runs at 16ft. or thereabouts to a ton. The biggest blocks ever quarried in recent years had 120ft. in them; blocks of 100 or 110ft. are frequently brought out. The bed beneath the Beer is green sandstone. In the top bed many interesting fossils, such as shark's teeth, sea eggs, Jew's snails, &c., are found, but they are seldom or ever met with below that.

It is very interesting to traverse the old workings, and see the pickmarks of our forefathers, fresh as if chiselled only yesterday. The roofs of the new working show a distinct difference to the more ancient ones. Since powder was discovered, it has been used regularly, and the roofs are blackened therewith. But this is not the case in the other parts. In the old Norman workings, the roofs are worked very level and flat. The old men seem to have used precisely the same picks, but the indications go to show that in the olden time the blocks were never quarried so large in size as now. Going back to earlier workings than the Norman part, the roofs are left, not flat, but round-headed, groined in point of fact.

Although I mentioned the size of the quarries just now actually worked as extending over some acres, I suppose, however, the stone may be deemed in itself practically inexhaustible, for the strata are continuous right down to the sea, a mile and a half away. There it runs out in the cliffs, some 20ft. above high-water level.

Some four years ago, an open quarry was commenced upon the opposite side of the road to the underground ones. The beds there run somewhat deeper. I saw many stones five feet in the bed. At present, there must be blocks stacked up to the weight of very many thousand tons, and as most of it stood there all last winter—a very trying test—without the frost touching it in the least, that fact speaks well for its standing powers. The vast piles of waste—miniature mountains that rise at every hand,—indicate that in remote times the quarries were worked on a very large scale. The chapter rolls of Exeter Cathedral record how, in 1325-30. Bishop Stapeldon brought the stone for the choir and Lady chapel principally from these very quarries, and it continued to be brought until the completion of the nave in about 1350.

The upper bed is burnt for lime, and for this lime there is a large demand. The two lime-kilns have been burning for full 150 years—literally been burning for that time—for one or the other has never been out for over that period.

Beer-stone is delivered, I believe, in London, at 1s. 4d. per foot, and can be worked almost as cheaply as Bath. I do not remember to have seen much of it in the metropolis, and probably many in town are unacquainted with it. But here in the West, wherever an old building exists, be it ecclesiastical or domestic in character, Beer-stone is nearly sure to be found.

At this holiday season, it is especially advantageous to know what exists in out-of-the-way places. Beer, in its people, and in its customs, is one of the most primitive localities I know of in England.

If the stranger chances to be anywhere within a fair distance of the place, he may go farther and fare worse than he will do by spending just a few leisurable hours at this odd little Devonshire fishing-town. Harry Hems.

EXPERIMENTS ON THE FLOW OF WATER IN RIVERS.

THE phenomena observed in the flow of rivers and streams have established a few facts that are of value to the hydraulician. It has been found from careful experiment that the water at the bed of a stream gradually rises to the surface. Mr. James B. Francis, an eminent American hydraulician, placed a white substance having the same specific gravity as water at the bottom of the stream, and it was noticed that the water thus coloured rose to the surface at a point some distance below where it was placed. In a paper recently read by Mr. De Volson Wood, C.E., before the American Society of Engineers, the subject is discussed. Mr. Wood, while admitting the correctness of the facts, observed that the surface water must necessarily find its way to the bed of the stream. Experiments made upon large rivers recently have proved that the position of maximum velocity in the cross section of a flowing stream is at a point below the surface, somewhere between the surface and the mid-depth of stream. Previously it was thought that the maximum velocity was at the surface and that it decreased with the depth. D'Aubisson, Morin, and other authorities based their conclusions on experiments made upon rectangular canals of shallow depths and beds of smooth kind; whereas the actual conditions of large rivers are quite different. It was thought at first, and very reasonably, that the frictional resistance of the air was the cause of a loss of velocity at the surface of the water, but Captain Humphreys and Lieut. Abbott showed in their report on the Mississippi that such was not the case, as that when the wind was blowing with the stream the maximum velocity was still perceptibly below the surface. Mr. De Volson Wood quotes Boileau, who wrote a quarter of a century ago, in which he says "we must seek for an explanation of this phenomenon principally in the mutual actions which bind the particles to each other and in the oblique and rotary movements among the particles which result from these mutual actions and the unequal velocities of the neighbouring particles." Mr. Wood accepts this statement, and believes it furnishes a general explanation for various phenomena in the movement of water. We are compelled to admit the untenableness of the assumption that the path of a particle of water is regular or that the particles move in filaments. There can be no doubt from the experiments of Mr. Francis and from the observation of water moving in streams, that the motion is tortuous and that the particles pass from the bed of stream to surface, and vice versa, producing various vertical, lateral, and other movements according to the impediments in the way. Thus the obstruction along the banks of a river deflects the stream and causes a wave-like motion, extending more or less to the centre of it. Mr. Volson Wood in this way thinks the vertical movements originate in the bed of the stream, and that any irregularities in the bed, or a gravelly bottom, will cause the water either to ascend or descend. No doubt the undulating movement is the cause of the action from the bottom upwards. In fact we are strongly inclined to agree with Boileau that various rotary and oblique movements are produced from these irregularities combined with the mutual actions and unequal velocities of the particles. Mr. Wood draws a conclusion that must at once be accepted as a general principle of these actions, that the apparent or measured velocity at any point of a stream is the resultant of the velocities of many particles, and is not necessarily the actual velocity of any one of them. We cannot quite concur in the author's observation that in a rapid deep stream we would expect the point of maximum velocity to be deeper when the bed is rough and rocky than when it is smooth and regular. The effect of an uneven bed by promoting vertical undulation would, to our minds, retard the current near the bottom. Mr. Wood's theory, while it explodes the "laminar theory," and though based on right premises, does not clearly explain the observed facts, and we may suggest there are other elements necessary to a complete solution of the question. It may be suggestive of inquiry whether difference in temperature may not have something to do with these inner circulating motions, and the position of the point of greatest velocity. Vertical and lateral motions are easily explained on mechanical principles, but may not the effects of heat and cold on particles of water produce similar effects to those observed in the ascent of smoke up a partially heated flue? The phenomena observed are very analogous.

SLUICES AND PENSTOCKS.*

By H. O. Smith.

THE sluice and penstock figure somewhat largely in works of sewerage, irrigation, and water supply, which are demanding at the present time a considerable share of attention. The aim in this paper will be to call attention to a few leading features in design and construction, not with a view of introducing anything novel, but with the idea of eliciting by discussion facts based upon actual experience.

The author will simply refer to the ordinary sluice-door commonly used in irrigation and works of sewage disposal, and to the penstock employed most frequently in works of sewer construction, and will exclude the sluice-valve, reservoir valve, flushing-gate, tide-valve, &c., as being types far too numerous in design to admit of more than a passing reference.

Sluice-door.—The sluice-door is commonly constructed of wood, while the side grooves and sill are formed of either wood, stone, brickwork, or iron. Where durability is desired, cast-iron frames are best; however, the author has found wooden frames preferable where an absolute watertight door is required. Fairly planed faces upon the doors and frames, and fairly-cut grooves have produced all that can be desired. Cross-tongueing to the doors is essential, and ledging is better than framing and clamping. The sill should not be grooved, as grit or other deposit therein is found frequently to prevent the door being "sent quite home," and a leak accordingly occurs.

A good example of the wooden sluice was employed by Mr. Baldwin Latham, in the turbine chambers, at the Beddington sewage outfall, upon which works the author was engaged as resident engineer. The doors to the openings, 4ft. in the clear, were of $1\frac{1}{4}$in. cross-tongued fir, and the frames $4\frac{1}{2}$in. × $4\frac{1}{2}$in. oak with $1\frac{1}{2}$in. grooves. These doors frequently stood with a 6ft. head of water above the sill, with only a trifling leakage. The most primitive fastening is probably that of the vertical arm, pierced with holes for the insertion of an iron or wood pin, which is also passed through the upper rail of the sluice frame. The rack and pinion, lever and quadrant, find considerable favour and are largely employed.

A very inexpensive sluice-door was designed and used by the author with very satisfactory results. It consists of a grooved fir frame $4\frac{1}{2}$in. × $4\frac{1}{2}$in., with two oak top-rails $3\frac{1}{2}$in. × $1\frac{1}{2}$in. The door is of $1\frac{1}{4}$in. cross-tongued fir, with $1\frac{1}{2}$in. × $1\frac{1}{2}$in. wrought iron braces let in flush.

Iron frames are made with angle-iron uprights $1\frac{1}{2}$in. × $1\frac{1}{2}$in. × $\frac{3}{8}$in., 3ft. 3in. in length, and top rail of 2in. × $\frac{1}{2}$in. flat iron with forged bearing for gun-metal bushing. The author fitted this class of door a few months since and the cost delivered, including $1\frac{1}{4}$in. diameter square threaded screw 2ft. long and a gun-metal nut and bush, was 18s. 6d. each.

Good examples of wooden sluices may be seen on most of our English rivers and in irrigation works at home and abroad.

Penstock.—The penstock is largely employed in main sewers, either for the purpose of shutting off, penning up, diverting, or regulating a current of liquid. Tidal outfalls especially require them, as tide-valves are unreliable and in many cases simply valueless. In heading up for flushing purposes the penstock is not so effective as the old stop-board or sluice-door which can be lifted suddenly.

The design and material of which penstocks are constructed depend upon their size and the work they are called upon to perform. With waterways of about 6ft. area and under, and small heads, the reservoir type, in which the body of the valve is lifted by means of a capstan-headed nut working in a vertical screw, is a good and inexpensive design. The author has had several of these in almost daily use for some time. They are 3ft. in diameter, and are easily worked with one hand. The head of water is, however, small, being never over 10ft. Above this size it is advisable to have counter-balance weights, and the rack and wormwheel motion is probably the best method for raising and lowering the door.

In the majority of instances, with small as well as large sizes, compound gearing is to be recommended, as by its means more power can be brought to bear both in screwing home and in commencing to open, and when working easy the key can be shifted from one spindle to the other and the door lifted or closed more rapidly.

The best method of facing penstocks is probably by gun-metal strips with planed faces both in the door and frame and fitted with wedges and adjusting screws.

ENGLISH ARCHITECTURE IN THE SIXTEENTH AND SEVENTEENTH CENTURIES.

IF we look a little closely at the principal characteristics of the buildings of this period, remarks Mr. E. Ingres Bell in *The Magazine of Art*, we shall see at once the fundamental differences which distinguish them from the structures of preceding ages. Before the commencement of the sixteenth century the mere appearance of a building may be said to have been—in a certain sense—a matter of accident. It was the natural outcome of an exact compliance with given requirements of plan, and a vigorous application of settled principles of construction honestly worked out by an artistic instinct, which touched nothing that it did not adorn. It charmed us by a naïve simplicity, which may be likened to the unstudied graces of childhood, and its comeliness was mainly due, so to speak, to a healthy constitution and an entire absence of affectation. The Elizabethan and Jacobean architects "changed all that." They were nothing, if not affected. Their buildings possess distinctively pictorial excellences of the highest order, but they were arranged on quite different principles. A desire to produce an attractive exterior holds the first place in the mind of their designers, or takes equal rank with some childish conceit, such as that of Thorpe's in making the initials of his name the ground-plan of his own house. This kind of conceit was rampant in the literature of the day, which, like the architecture, was full of "quips and cranks and wanton wiles."

In direct contravention of the wholesome Mediæval rule so aptly formulated by Pugin, construction was disguised or falsified, and ornament and ornamental features were *constructed*. The simplicity of childhood—to use a former figure—had given place to the conscious arts of the maiden, or the airs and blandishments of the coquette.

Another noticeable point in the work of the period is that absence of all evidence of "man's delight in God's work," in which Ruskin sees—and no doubt rightly—all really fine and great art. The loving skill with which the Mediæval mason traced in the hollows of his mouldings every flower of the field finds no place in the Elizabethan scheme. The cunning of the carver has disappeared with the love of natural beauty. The art of the sculptor had fallen in England beneath the level of contempt, while in Italy it was compelling the admiration of the world. We must go back to Chaucer for this intense feeling for the beauties of inanimate nature. It breaks out in Shakespeare now and then in a stray song or allusion, but only as accessories to his main figures; with him and his age "the proper study of mankind was man." The architecture, according to rule, reflected the temper of the time. It was scenic, dramatic, artificial; built, as the scenes of a theatre are, for effect, and unable like them to bear a scrutiny in detail. It lacked the loving skill with which the likeness of natural objects was reproduced in the discarded Mediæval system, and it had not acquired the precision and perfect finish of the monotonous ornamentation of the Italian types which it emulated. Ornament of a kind it had in abundance, and must have to satisfy the absorbing craving for effect, but in all things it strove to "catch the nearest way;" and its long array of pierced parapets, the terminals which mark the broad flights of steps, its grotesque alcoves and summer-houses, and the involved medley of stone twists and tangles which crown its pavilions and give piquancy to its sky-lines, are coarse and mechanical in design and workmanship, and give no hint of the individuality or delight of the workman.

Still, in spite of this, nay, perhaps because of this, the class of buildings we refer to are in a special and peculiar sense picturesque and suited to the purposes of the painter, until, indeed, one is tempted to conclude that the pictorial quality in architecture is inversely as its structural propriety and its conformity with the requirements of good taste.

Never had the science of building been so bent to the exigencies of a mere longing for display; never had the purely pictorial side of building been so persistently pursued. Yet, notwithstanding their absurdities, their many conceits and caprices, their indefensible solecisms, their cumbrous and ridiculous classicalisms, and the grotesque feebleness of their sculpture, they form a series of mansions of incomparable and unique magnificence. "And still," to use the appropriate and appreciative words of a modern historian—"still we gaze with pleasure on their picturesque line of gables, their fretted fronts, their gilded turrets and fanciful vanes; the jutting oriel from which the great noble looked down on his new Italian garden, its stately terraces and broad flight of steps, its vases and fountains, its quaint mazes, its formal walks, its lines of yews cut into grotesque shapes in hopeless rivalry of the cypress avenues of the south."

THE REPORT OF THE COMMISSIONERS FOR THE EXHIBITION OF 1851 AND THEIR SUGGESTIONS.

LAST week we gave a brief *résumé* of the sixth report published by the Commissioners for the Exhibition of 1851. We may now refer in more detail to the subjects dealt with in it, and to the suggestions made. The site of the Exhibition of 1862 is the first topic; the report speaks of the steps taken to utilise, by the Government, the site which was sold at less than half the value on condition that it should be devoted to science and art. The annual international exhibitions of 1871, 1872, 1873, and 1874 are next mentioned; and the Commissioners observe that the experiment has been carried out at comparatively small cost. We should have been better satisfied with a few particulars of the actual results of these collections, but these are published in a special report drawn up by Sir Henry Cole. It appears that the Exhibition of 1871 "surpassed expectations," that of 1872 was less prosperous, and the others decreased in public interest. The total loss on the series of exhibitions is stated to be £22,254. Viewed as means of public instruction, the results are, if we may take the report, more assuring. This contrasts, Sir H. Cole says, very favourably with the cost of the national museums, the cost at the British Museum being nearly 4s. per visitor and that at the South Kensington Museum being about 1s. 3d. per visitor. The objects exhibited, purchased, and lent have been contributed to the South Kensington, the Bethnal-green, the Sheffield, and the Nottingham museums. Mention is made of the School of Art needlework which leaves one of the buildings, and which numbers 100 of lady workers, the School of Cookery, and of the motives which induced the commissioners to enter into relation with the Royal Horticultural Society, and the subsequent surrender of the gardens. The Society's lease of the gardens terminated at the end of last year. The erection of the Royal Albert Hall, the purchase of Messrs. Lucas's interest, the revenue from seats, &c., are discussed at length in the report, also the National School of Music, &c.

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* Paper read Aug. 1, at the annual meeting of the Association of Municipal and Sanitary Engineers.

The report says, "With regard to our present financial position we have the satisfaction of stating that in consequence of the great increase in the value of land at South Kensington, the capital vested in us, and represented by our estate, is considerably larger than at the date of our last report. . . . . We have sold to the Government at less than half the value the site of the new Natural History Museum, at that time worth upwards of £240,000, thus benefitting the nation by more than £120,000. We have given the site of the Royal Albert Hall, worth £60,000, and have property in it which cost £80,000." Altogether, on money expended on objects of art and manufacture, now distributed in museums, the commissioners say they have contributed to public purpose, a sum of nearly half a million. Considerations of future policy form the most interesting part of the report before us. The idea of capitalising the property and distributing the proceeds among various provincial institutions, pressed upon the commissioners from provincial boroughs, has not been entertained on the ground that such a course would be at variance with the appropriation of the land originally contemplated. The report speaks of the stronger claims of the South Kensington Museum. The proposals made are, that a science building be erected on the northern boundary of the present ante-garden of the Horticultural Society, connecting the present east and west picture galleries, and leaving the principal part of gardens untouched. The building would complete the group or plan already partly accomplished, and would contain laboratories, a library, a collection of scientific instruments, &c. On the south side of the new building a piece of ground would be left free for a possible extension of the science museum. The Commissioners offer to place the picture galleries at the disposal of the Government, by leasing them for a term of years at a rent based upon the amount spent upon their erection; also to lease a part of the gardens north of the proposed science building free of rent, on condition that it is maintained wholly or partially as a public park. They further propose to establish provincial scholarships for the purpose of aiding the development of scientific culture and technical training in the manufacturing districts. The plan accompanying the report exhibits the scheme, which, if carried out, would form, together with the Natural History Museum, a fine group of educational buildings.

GUISBOROUGH ABBEY.

UNTIL recently, writes the Rev. Mackenzie E. C. Walcott to the *Times*, the visitor to Guisborough Abbey has seen only the east end of the church—a masterpiece of Decorated art—and turned away to solace his eyes with the beautiful gardens, the oval time-tree avenues, and marvellous horse-chestnut rooting its pendent branches and measuring 120 yards in circumference, which adjoin it. In a happy moment that kindly gentleman, Admiral Chaloner, during the last two springs, has occupied about fifty men who were out of work in the removal of the brambles and masses of stone which had been thrown down when the minster was leased out as a quarry. A score and a half of fine walnut trees were also sacrificed. The site is now laid down with soft turf, and kept in a way which should stimulate other possessors of "ruins" to imitate this laudable undertaking. For the first time the dimensions of the church have been ascertained; it was 367ft. long by 77ft. in width. The western walls of the aisles of the nave have been laid bare, and also the bases of four pillars of the northern arcade, and the south-west footstall, with sufficient remains of bases and shafts to enable an archæologist to reproduce the plan of the central alley. The site of the roodloft, deeply dinted into the soil, probably by the fall of a central tower, is clearly marked, and two tombstones direct the eye towards the place of the high altar. Besides two coffins with trefoiled heads, a portion of the end of the tomb of the founder (erected long after his time) remains, which has been recovered from Hardwicke, whither it had been removed. It exhibits the shield of the Bruce arms, borne by St. Mary, round whom are kneeling figures of Austin Canons in surplice and cope. In the spandrels are a cock on a rail and the Madonna. The upper slab covers the altar in the parish church, and in the porch are the two sides, with knights in armour bearing shields, and in the interspaces bishops, abbots, St. Jerome, and saints at their devotions or study. Along the cornice appear the Evangelistic symbols, the sun and moon, the chalice, the shell of Compostella, mitre and staff, a cock on a rail, an eagle, and other devices. Southward of the church, at a distance of 146ft., is part of the cellarage of the refectory—40ft. by 10ft.—in two spans, with quadripartite vaulting. To the north-west is the lower storey of the gatehouse, with a round-headed arch, and the arches of the postern and entrance to the abbey court. The guest-house is probably represented by a wall with Late Perpendicular windows fronting the market-cross in the town. It is only by such careful conservation as we find here that our national monuments now in decay can be retained, and a faint glittering of the golden age of English architecture still recoverable be brought back.

RENDERING WOOD FIREPROOF.

AT the meeting of the British Association recently held at Sheffield, amongst the many novelties that came before that body was one relating to the preserving of wood from fire. The inventor, according to the *Timber Trades Journal*, is Colonel P. P. De la Sala, and amongst the various models and specimens exhibited by him at the Cutlers' Hall, Sheffield, before the Association, were non-inflammable wood for building purposes, pliable wood, fretwork, besides shavings of non-inflammable wood for the manufacture of mats, rope, &c.

The groundwork of Colonel De la Sala's invention consists of, if not absolutely destroying, at any rate modifying the brittle and inflammable properties of dry vegetable substances, either in their compact or fibrous state. The inventor thus explains his peculiar method, already patented:—

"Though all alkaline compounds reveal the property of rendering vegetable matter more or less pliable and non-inflammable, I preferably make use of carbonates of fixed alkalies in the following way. I dissolve in cold or warm clear water carbonates of potash or soda, or I make use of them in a solution of filtered water heated to the boiling point, and add hydrate of lime to this solution, graduating the strength so as not to exceed a specific gravity of 1·060 if potash is used, or 1·050 when soda is used. In the first case the strength of the solution corresponds to about thirty grains of hydrate of potash to the fluid ounce, or about twenty grains of hydrate of soda to the fluid ounce. Wood to be used in naval construction and in buildings or structures of wood on land, as well as vessels and land buildings already constructed, can be rendered fireproof by saturating the floors and decks and all exposed woodwork with alkaline lyes, and when dry the wood may be whitewashed, painted, or varnished in the usual way."

With reference to larger timber the inventor goes on further to state:—

"For boards, planks, or thicker pieces of timber I graduate the time of immersion so as to form a coating of from one-sixteenth to one-eighth of an inch, which can be obtained in from four to twelve hours, according to the more or less porous nature of the wood or the compactness of its fibre. I consider a coating of about one-eighth of an inch deep to be a sufficient fire protection for all kinds of timber for building purposes, as the spread of fire and great conflagrations generally originate in relatively small causes, such as burning cinders, dropped sparks from fireplaces, matches accidentally ignited, inflamed liquids, candles left burning; but the fireproof coating can be made deeper, or even go through the whole timber, in the event of its being considered desirable to combine great flexibility with absolute non-inflammability. In this case I make use of hydraulic or other pressure, so as to force the alkaline lyes through the wood to the extent desired."

When veneers are operated upon it seems they are immediately afterwards rolled between steel rollers or pressed between steel plates. Wood thus treated, says Colonel De la Sala, is proof *against any ordinary heat*. Whether the invention will really accomplish as much as the originator claims for it, experience only will show. There may be considerable value in this process for destroying combustibility, but it remains to be seen whether it is better than every other mode of treating wood for the same objects, *and at the same cost*. Common paint or white lead thickly laid on renders wood to a certain extent unignitible from the painted surface, but if once the body of the wood is ignited the external paint checks the burning but little.

CHIPS.

The viaducts, bridges, and other works of deviation on the London and North-Western Railway's Chester and Bangor section of the main line, rendered necessary by the disastrous results of the storm in the neighbourhood of Llandulais. are completed. Mr. W. Smith is the district engineer, and Mr. H. Footner is the constructor of the deviation.

The new barracks at Dorchester are completed, and have been handed over to the War Office Department by the contractors, Messrs. Bull and Sons, of London and Southampton. The same firm is also erecting a new water supply reservoir for the Dorchester Corporation.

Three blocks of buildings are in course of erection on St. Paul's Rectory-garden, between Church and High-streets, Deptford, for the Improved Artisans' Dwellings Company. They are each five stories high, with stone staircases springing from landings, and divided into suites of two, three and four rooms. There are in all 450 rooms, arranged as 155 separate tenements. The fronts are constructed of white stock bricks, tuck-pointed, with dressings of artificial stone, and the roofs are flat and will be used for clothes' drying. The first block, that facing Crossfield-lane, is to be ready for occupation in November. Over 170 bricklayers, carpenters, painters and glaziers are employed on the works. Mr. Gilham is clerk of works, and Mr. G. S. Double the foreman.

The memorial-stone of a new Baptist chapel and school was recently laid at Martham, East Norfolk. The buildings are erected of red bricks, with Cossey moulded bricks for the chapel front and window dressings. The roof will be partially ceiled, the principals and chief purlins, which will be of pitch-pine, being shown. The platform will be 3ft. high, with reading-desk for minister in centre, and in front of this will be the baptistry. The buildings are being constructed from the designs and under the superintendence of Mr. J. G. Robins, of Norwich, by Messrs. Mallett and Gaze, contractors, of Halvergate. Exclusive of site and bricks, which are special donations, the cost will be £600.

At a special meeting of the O'Connell Monument Committee, held at Dublin, on Thursday, the 4th inst., the question of the material of the pedestal was discussed with Mr. Brock, who succeeded the late Mr. Foley as the sculptor, and it was decided to invite tenders of the best Irish limestone. Mr. Brock reported that the work would be completed in two years' time; the principal statue was well advanced, one of the sitting figures at the base of the monument was nearly completed, and another was in hand. The site of the memorial has not yet been determined upon.

The Dublin Corporation recently received, an official communication from the Duke of Marlborough, as Lord Lieutenant, announcing that he proposes to appoint a Royal Commission to inquire into and report upon the sewerage and drainage systems of the city of Dublin, and their effect on the sanitary condition thereof. The inquiry has been intrusted to Mr. Robert Rawlinson, C.B., C.E., chief engineering inspector of the Local Government Board in England, and Mr. F. Xavier M'Cabe, inspector of the Local Government Board in Ireland.

It is proposed to erect new premises for the Bridport School of Art, which since its establishment in 1865 has been held in the Scientific Institution. The estimated cost is £1,000, towards which three gentlemen have given £350.

Four new stained-glass windows have just been inserted in St. Nicholas parish church, Brighton. The series on the south side has been completed by a window representing the Annunciation of the Virgin Mary; that on the north side by one on which is portrayed, "Christ Bearing the Cross." At the end of the south side is a window on which is depicted St. Nicholas; and the fourth window is in the chapel of chancel. The heating and lighting of the church have also been improved.

The Lady chapel of St. Mary's Roman Catholic Church, Bridge-gate, Derby, was reopened on Sunday week, after being restored and decorated in gilding and colour. The work has been carried out by Mr. Cantrell, of Derby.

Public meetings have been held at Hull recently in support of the projected Hull and Barnsley Railway, by which it is proposed to break the monopoly of the North-Eastern line at Hull, and to form a direct connection between that port and Liverpool, with junctions with the principal railway companies. The plans have been prepared by Messrs. W. Shelford, Westminster; and G. Bohn, of Hull, engineers.

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ILLUSTRATIONS.

DESIGNS FOR THE IPSWICH POST OFFICE AND MUSEUM.—MEMORIAL WINDOW AT LANHURST.—HOLMBURY ST. MARY CHURCH, SURREY.—KINGSCLERE HOUSE, STRATFORD.—HAWTHORN VILLA, HEADINGLEY.—NEW PREMISES IN FLEET-STREET.

OUR LITHOGRAPHIC ILLUSTRATIONS.

IPSWICH POST OFFICE.

The style adopted is Roman, the walls to be faced externally with brick and Portland and Bath stone dressings. The simple treatment adopted was necessitated by the sum stipulated in the conditions.—E. F. Bisshopp.

IPSWICH MUSEUM AND SCHOOL OF ART.

The plans are arranged on the parallelogram system, with open areas between each block, long gutters on the roof being thus avoided, and cross ventilation obtained. The style adopted is a simple form of Tudor, with red brick facings and tiled roofs. The heating for Museum to be by Price's warm-air apparatus, and that for Science and Art portion by Gurney's stoves.—E. F. Bisshopp.

IPSWICH POST-OFFICE AND IPSWICH MUSEUM AND SCHOOL OF ART.

The other two designs which we illustrate are also by a local architect, Mr. Brightwen Binyon, whose plan of the Museum bore the motto, "Well Considered," and whose *nom de plume* for the Post-office design was a postage-stamp. We have already remarked upon these drawings when reviewing the whole series, and the author has not sent us any further particulars.

WINDOW FOR LANHURST, DERRY, U.S.A.

Our illustration shows "The Last Judgement," with which it is proposed to fill the lower lights of this window; the upper portion and tracery to be at present filled with plain leaded work in geometrical patterns. The lower groupings show on the right hand of St. Michael the saints rising from the grave, and on the left the condemned. The upper portions of lights contain in the centre our Lord as Judge, and on either side the B. V. Mary, and St. John the Baptist, with the Apostles and Angels. The colouring is simple, mainly in tones of white and amber. Messrs. Gibb and Howard are the artists, and are engaged on a further design for Mr. Rowntree.

HOLMBURY ST. MARY CHURCH, SURREY.

The church of which we give an illustration is being built in one of the loveliest spots on the hills south-west of Dorking, from which it is distant about six miles. It is built of stone quarried on Holmbury Hill, carefully wrought on the face and supplemented by Bath stone for all the more elaborate features of the detail. The church is small but much varied in plan, so that very considerable effect is produced in the interior. The plan provides a nave and aisle, a larger north aisle, under which are the vestries, and a large chancel divided from the nave by a high screen. A second high screen under the turret at the west end separates the western bay of the nave from the church, so that there may be no difficulty about leaving the church always open for those who wish to use it. The roofs are all open, with tie-beams in the nave, and arched beams with tracery of oak in the chancel. The altar will have an Early Florentine picture for the retable, and most of the other furniture will be very carefully and completely designed. Owing to the great fall of the ground, there is room below the floor line for a sexton's tool house, two vestries, and a chamber for the heating apparatus, and a feature in the exterior is the canopied founder's tomb in the south wall of the chancel. The south porch, and an organ chamber on the south side of the chancel, are both groined with stone roofs. The church, which is nearly completed, has been built by Messrs. Wall and Hook, of Brinscombe, from Mr. Street's designs.

KINGSCLERE HOUSE.

This house is erected on the north side of the Romford-road, near Stratford, Essex. It is built of stock bricks, with bands of white Suffolks. The gables are timbered, with panels of Portland cement rendering, with incised floral ornamentation; the roofs are slated, and with red ridge tiles and finials. Mr. Henry Ough, of Austin Friars, is the architect, and Mr. Mortar, of Stratford, the builder.

VILLA AT HEADINGLEY, NEAR LEEDS.

This villa has just been completed for Edwin Wild, Esq., from the designs of Henry Perkin and G. B. Bulmer, of Leeds, architects. It is built of local pitch-faced wallstones, with Horsforth sandstone dressings. The roofs are covered with light green Westmoreland slates, and ornamental red ridge tiling.

NEW BUILDINGS IN FLEET STREET.

Our illustration is a view of the large pile of buildings recently erected in Fleet-street. This version of the Classic style, possessing affinities with the Queen Anne and Renaissance, was adopted by the architect to aid in keeping alive the historic reminiscences of this ancient highway. The bricks used are of a deep red tint, and are pointed with a pink joint. The dressings are of Dumfries red sandstone, the pilasters and entablature which comprise the ground and first floor being formed of Ross of Mull polished granite. The carving is executed in high relief: the three national emblems are introduced in the frieze under the main cornice, characteristically treated, and the Arms of the Vintners' Company, who are the ground landlords, are displayed to advantage over the central bay windows, upon a shield surrounded with foliage and grapes. Upon the large trusses over the first floor are sculptured, double life-size, the busts of Wren, Johnson, Goldsmith, Caxton, Hogarth, Dryden, and Milton, celebrities formerly residents and habitués of this locality. The shop-fronts are of American walnut, with wainscoat and mahogany panels, and ebony fillets to the sashes. Stained glass in foliated lead quarries has been used with good effect in the fanlights. In place of the unsightly shutters so generally in use, wrought-iron grilles have been fitted for the protection of the shops at night, and are so constructed as to allow of their being raised and lowered from the basement. This block of buildings covers an area of 12,000 superficial feet, and the works have been carried out from the designs and under the supervision of Mr. Alexander Peebles, F.R.I.B.A., of 3, Salters Hall-court, Cannon-street, by Messrs. Langmead and Way, of Grays' Inn-road; the carving and sculpture have been executed by Mr. Bromfield. Messrs. Brawn and Co., of Birmingham, supplied the ornamental ironwork and some of the grilles, the remainder of the latter being the work of Messrs. Salmon Barnes and Co., of Ulverston. Mr. W. Heathcoat acted as clerk of the works.

SCHOOLS OF ART.

Burslem.—The annual meeting of the Burslem School of Art and Science was held last week. Mr. Thaker, head-master of the Art School, reported a falling-off in the number of students, especially in the mechanical drawing class, which had 21 fewer pupils, while the art classes had 26 below the number of last year. The result of the national competition had been the award of one silver medal, one bronze medal, and three book prizes to this school. The works sent to the Department comprised 88 in the advanced section, executed by 14 students; and 1,929 done by 123 elementary students. The examiners awarded the maximum grants on the works of 10 advanced and 12 elementary students, 6 of the latter being in the female evening class.

Royal Architectural Museum.—The re-opening of this school of art for its fifth winter session was made the occasion of the distribution of prizes and certificates in the presence of the students and their friends, including some ladies. The ceremony took place at the Museum, 18, Tufton-street, Westminster, on Monday evening. Canon Duckworth occupied the chair, and in opening the proceedings remarked on the admirable position of the school—situated on Thorney Island, closely adjoining the spot on which had been reared the grandest example of English art now extant, the Abbey identified with the highest dreams of our country's architecture, and with every period of her history, a building which Mr. Street had declared to be "the most lovely and loveable thing in Christendom." The inspiration of an edifice so full of beauty could not fail to tell on all the work of thoughtful students. The classes had been in existence about 28 years, but in its present form as an art school in connection with the Science and Art Department had only been in existence some four years. The total number of students showed a slight falling-off, 131 in 1878-9, against 135 in the previous year, but the average attendance had been larger and the results better, both in general character of work done and the certificates and prizes gained. For the first time the school had won a gold medal, the successful student being Mr. Andrew Garbutt, who had also taken a prize of £7 from the Plasterers' Company for the same work (a twisted column, original design). Mr. Garbut had also won the £50 prize of the Goldsmiths' Company, two Queen's prizes, and a 3rd grade prize. Two students, stone-carvers, William Kitson and Walter Allan, had obtained free studentships as well as 3rd grade prizes for modelled design and model from the antique. The chairman then distributed the awards, including two other 3rd grade prizes in addition to those mentioned, to George Pridmore for design, and James Smith for model from antique, three 2nd grade prizes, and eight certificates. The chairman announced donations to a special prize fund amounting to £7 2s., and himself added to it a guinea, which will probably be awarded for measured or detailed drawings from some feature of architectural interest in Westminster Abbey. Mr. Maurice B. Adams, hon. secretary, in proposing a vote of thanks to Canon Duckworth for presiding, warned the students not to aim exclusively at winning prizes; the goal should be to so use the opportunities afforded by the school as to become successful in after-life. Too often he had seen the man who had worked hard as a student and attained the most brilliant position on the prize-list, rest on the laurels won, lapse into indifferentism, and finally allow himself to be passed by his slower but more persevering co-students. Canon Duckworth, in responding to the motion of thanks, endorsed Mr. Adams's caution against resting on the outward and visible tokens of success; the only value of prizes was to show the student the powers he possessed, and he must by diligence and perseverance continue to develop these to practical advantage to himself.

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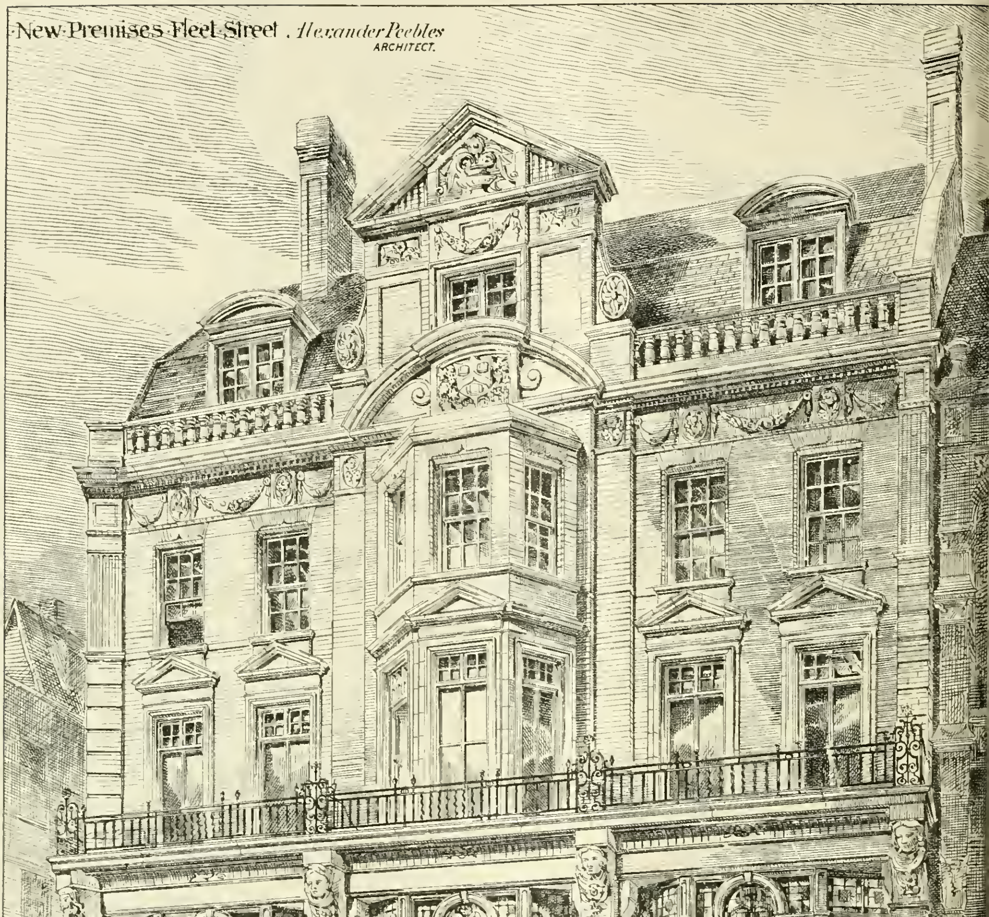
The Bishop of Lichfield, on Monday afternoon, consecrated the new Church of St. Saviour's, Talke. When completed by the addition of the south chancel aisle, not yet built, there will be sittings for 616 persons, and the cost of the structure and site is about £4,000. A peculiarity about the new church is that it has a basis of rafters, a new method of counteracting the effect of the insecure foundations, caused by mining, on which the edifice is built. The architect is Mr. Hunt, of London, and the contractor is Mr. Booth, of Kidsgrove.

THE BUILDING NEWS SEP 19 1879

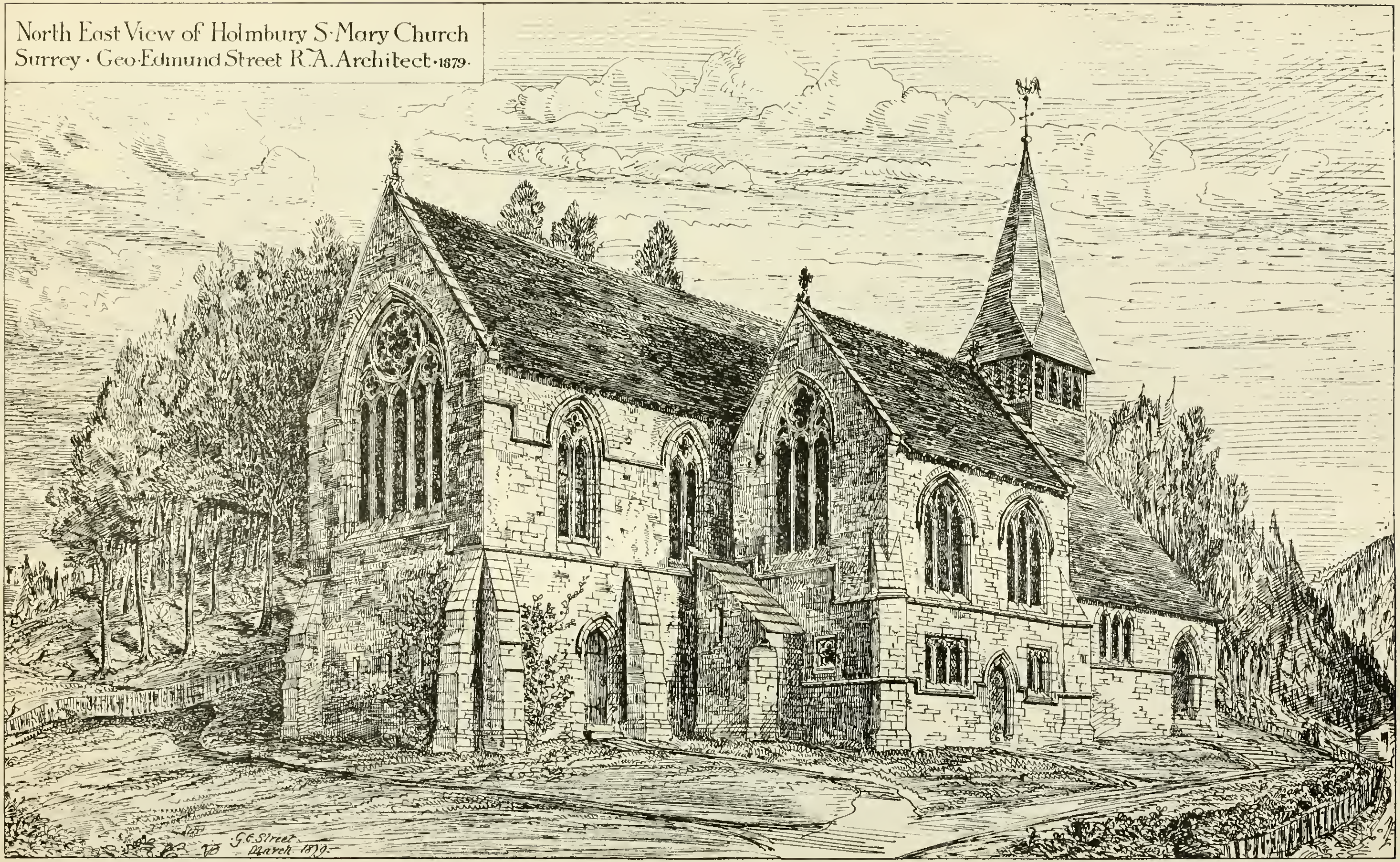


New Premises Fleet Street. Alexander Peebles ARCHITECT.

W. Penstone. del

Photo-Lithographed & Printed by James Akerman, 6 Queen Square, W.C

North East View of Holmbury S. Mary Church
Surrey · Geo. Edmund Street R.A. Architect · 1879.



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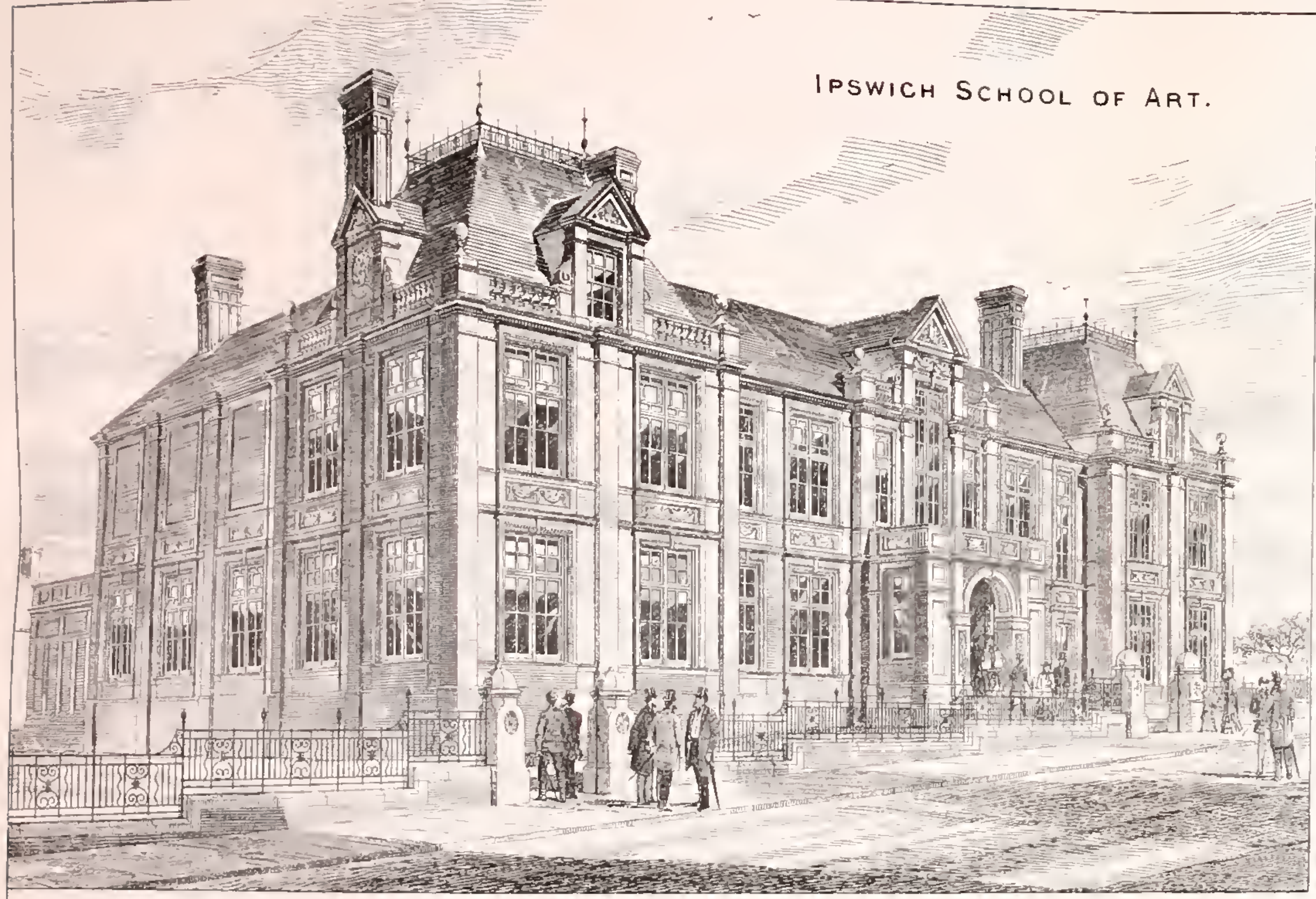
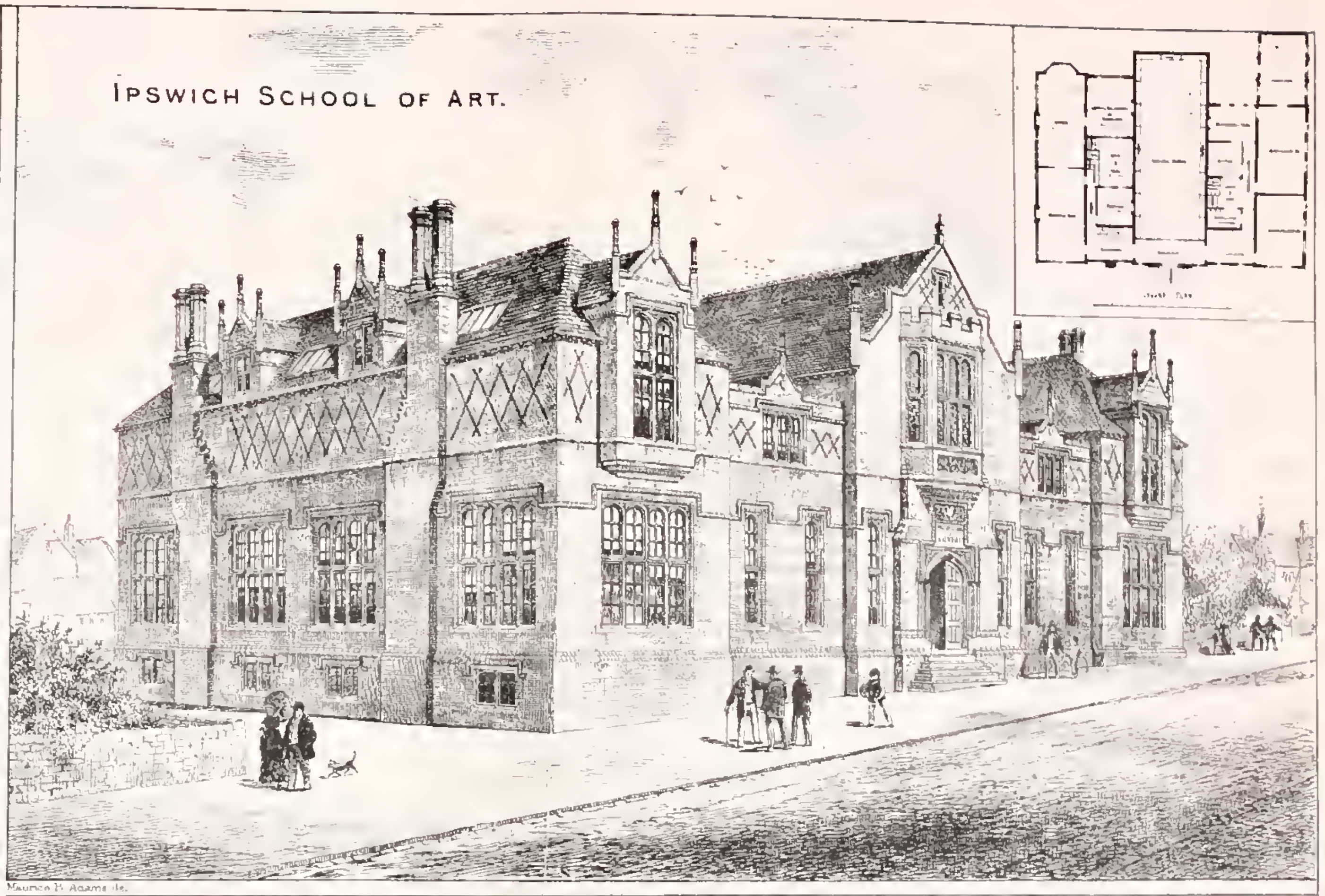

IPSWICH SCHOOL OF ART.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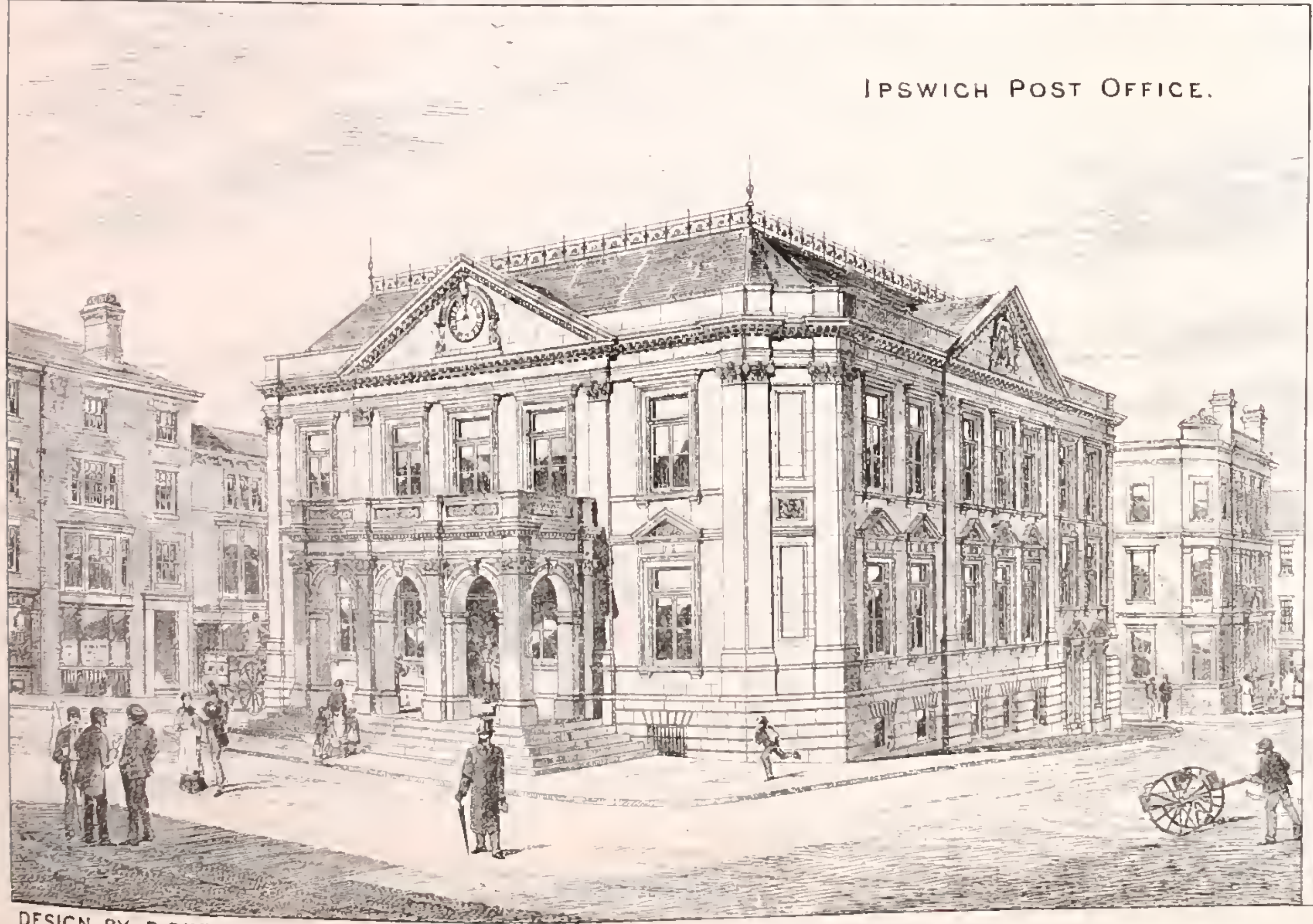
Maurice B. Adams del.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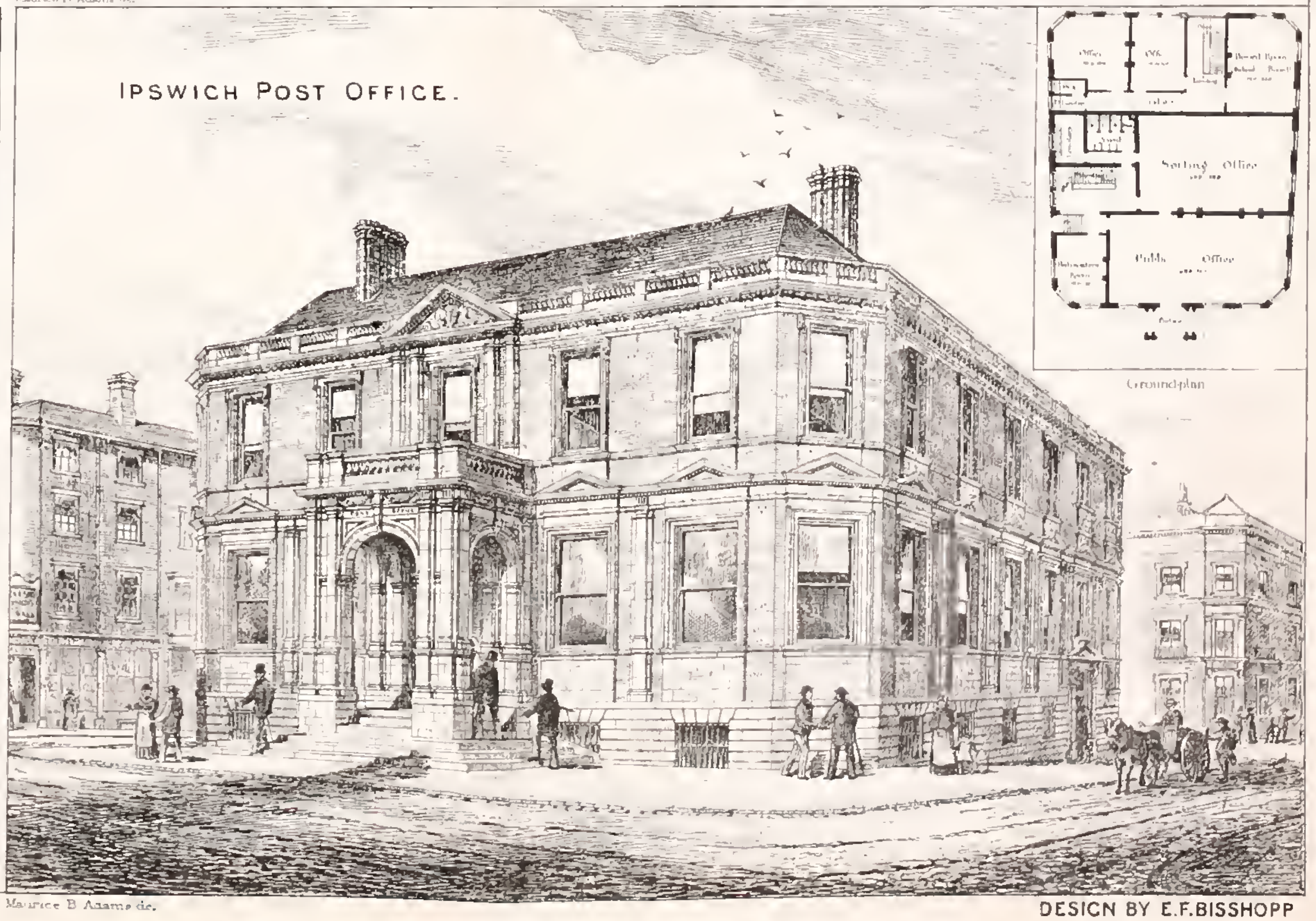
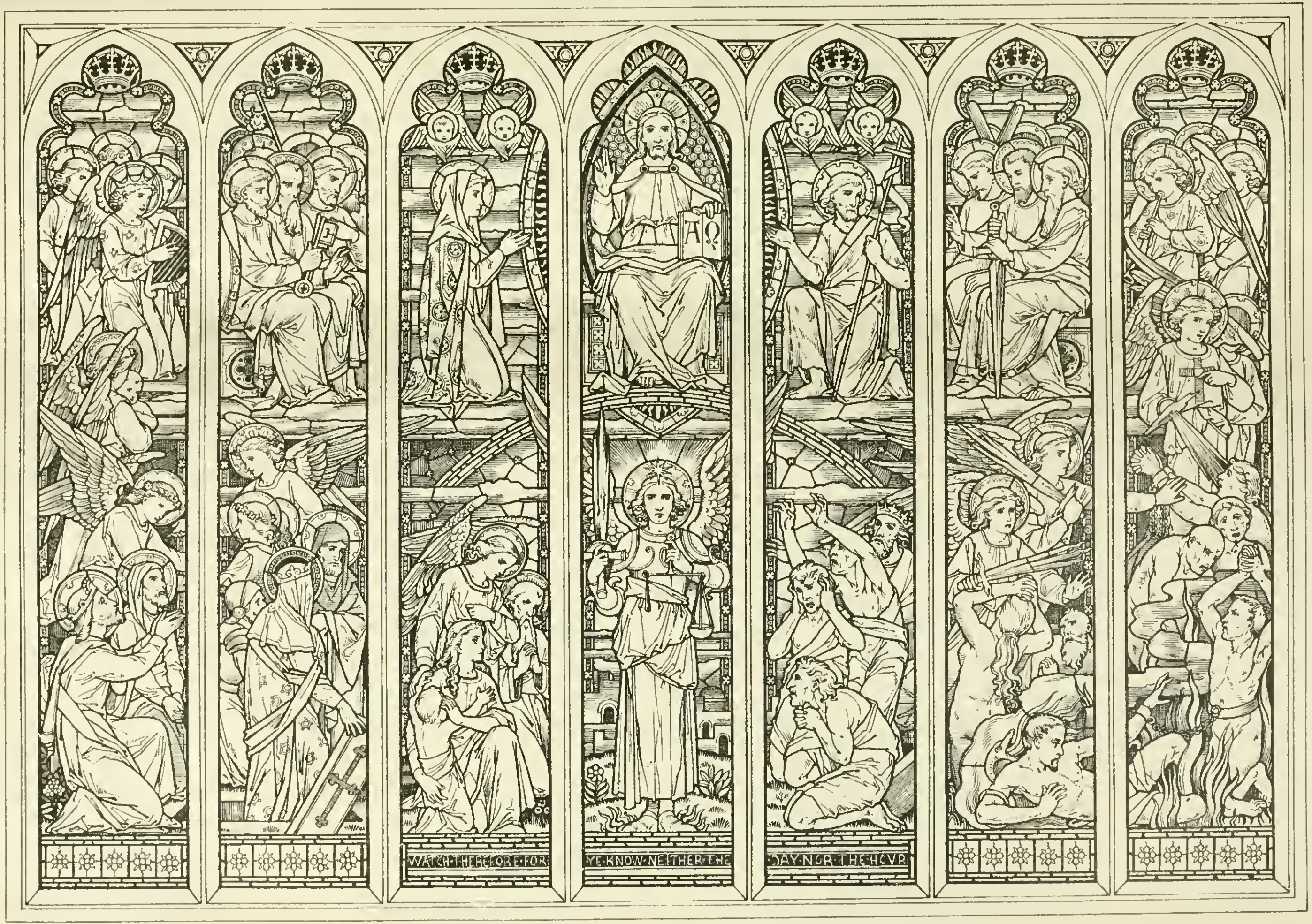


Maurice B. Adams del.

DESIGN BY B. BINYON.
ARCHITECT, IPSWICH

DESIGN BY E. F. BISSHOPP
ARCHITECT, IPSWICH.



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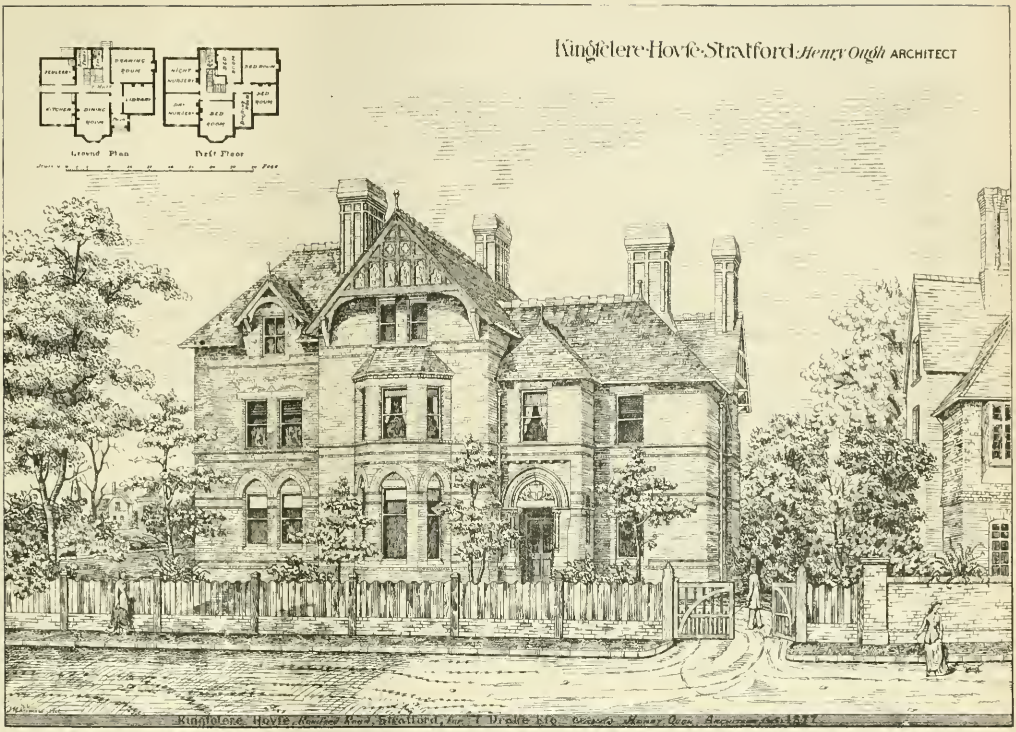
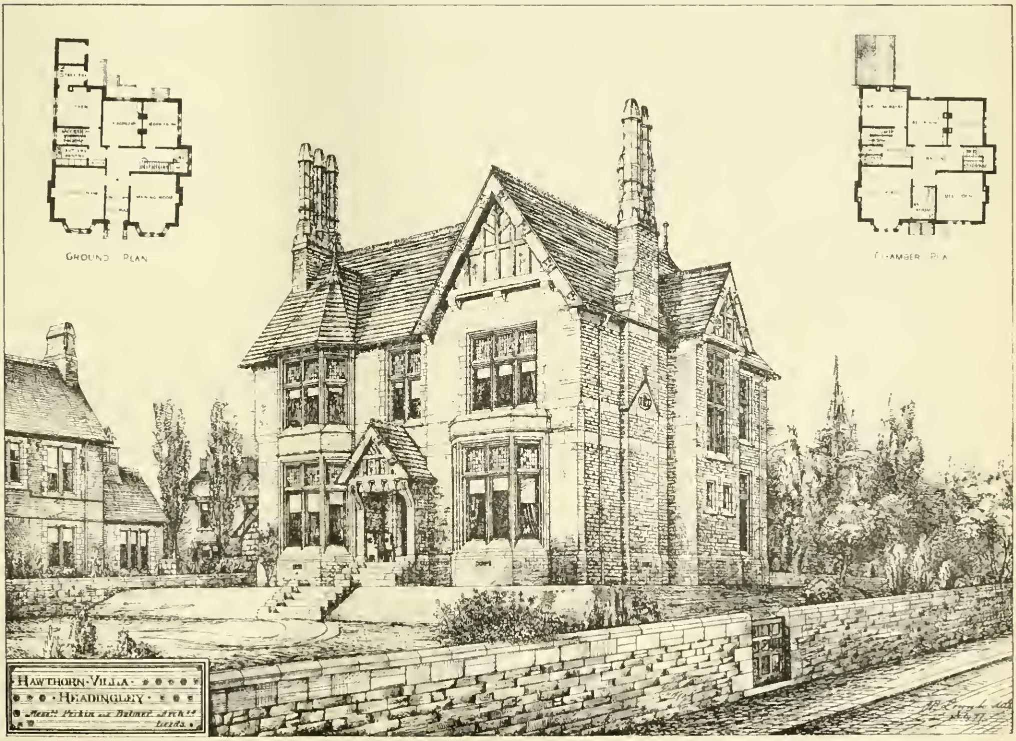
MEMORIAL·WINDOW· FOR·FREDERICK·H·ROWNTREE· ESQR· LANHVRST· DERRY· V·S·

DESIGNED BY ISAAC ALEXR GIBBS AND W. W. HOWARD





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THE AMBASSADOR EXTRAORDINARY.*

THE boast of some of its professors, that architecture is the mistress of all the arts, bids fair to include literature of a kind hitherto unfamiliar to the ambitious authors who, having won no mean reputation in their own calling, are now seeking new laurels in fresh fields. Not long since, we noticed in these columns the maiden effort of an architect-poet, which embodied genius of no common order, and to which a very favourable reception was accorded by the literary world. Now we have before us a novel, or "unambitious story," as the author prefers to call it, from the pen of another architect, already well-known so far as regards the literature of his profession. In neither case were the names of the writers given to the world at large, but a private avowal of the authorship having reached us in each instance, we may say as much as we have said without revealing secrets. "The Ambassador Extraordinary" is a work of very different character from that first alluded to, and will probably interest architects more than the general public. The story itself, it is true, has not much to do with architecture, nor, indeed, with anything else, but then the best parts of the book have very little to do with the story, which is meant to illustrate the "blessed quality of human love." The Ambassador Extraordinary is a very mystical and disagreeable character indeed. Invested apparently by the Powers of Darkness with the mission of tempting weak human beings to their own destruction, this "Viscount Malign" forms an alliance with a Roman ecclesiastic, Monsignor Paul Saint-Paul, to bring about the unhappiness of the latter's cousin, Julian Saint-Paul, and his affianced wife, Madonna Gay. It is apparently the love of the young lady referred to which overcomes the malignity of the persecutors, which, indeed, it could hardly help doing, seeing that just as all the snares which have been woven round the souls of the young couple are nearly finished, the tormentors relent in a remarkable manner, and all ends in marriage and cradles in the most orthodox three-volume-novel fashion. But take the story out of the book, and there is really some amusement to be got out of the rest of it. The author trots out some of his professional acquaintances in a laughable manner, which can hardly fail to gratify the types from which the characters are drawn. Master Georgius Oldhousen, F.S.A., professor of architecture of a highly advanced order, is particularly calculated to win the esteem of some of his younger brethren.

"The strong point of Georgius is a disdain for Common Sense. There is nothing he holds more completely in contempt—and he holds a great many things in very considerable contempt, if not derision—than this vulgar quality. His vocation is Art; and perhaps it may be said that Art, as matter of Uncommon Sense, and that which is commonly called Common Sense by common people, cannot be said to run well together at the best of times."

The private room of his house, which he has converted into a "Hall of the Thirteenth Century," is a charming apartment.

"The ceiling he has long ago adorned with beams and panels of deal skilfully stained to imitate old oak, the steam from a tea-kettle having been made to play over the work as an artistic finish, to remove the natural sheen of the modern but indispensable varnish. The windows also Master Georgius has filled partly with the bottoms of bottles and partly with painted glass in small quarries, from his own designs, representing King Arthur and the Knights of the Table Round. The walls he has hung with ancient tapestries, of no great pictorial merit and of doubtful delicacy, but of indisputable authenticity. The floor boards he has stained and varnished like the beams of the ceiling, puttying up the cracks carefully beforehand. The fireplace he has ornamented with a massive chimney-piece of oak, accommodating a dog-stove and irons, unfortunately new, but in excellent keeping with the rest. Of the furniture we need say nothing except that it is very old.

"But one thing which, more than all else, has troubled the mind of this ingenious architect at last, is the fact that the fire, in order to be an authentic fire of the period to which he pretends to belong, ought to burn in the midst of the floor, and not in a hole in the party-wall. To his intense disgust, however, the freehold landlord of the house objects to this, for the vulgar and entirely unartistic reason that it would burn the house down. For some similar reason the surveyor to the insurance office—actually an architect and F.S.A.—objects to it also. The tenant has moreover been invited to explain how the smoke would be got rid of; nor has his answer been accepted as satisfactory when he tartly said he would consult the authorities. In these circumstances of difficulty, an ingenious gas-fitter has contrived a manifestation of asbetos, which is to look like a pile of fagots in a condition of incandescence lying on a sound slab of stone about a yard square; and professional persons have been considering whether this can be allowed by the law. It is the declared intention, moreover, of Mr. Georgius to forswear carpeting for the room, and to go in for strewing the floor with rushes. It is his further intention to go in for occupying the apartment after the ancient manner, by night as well as by day, and in fact to sleep here on the floor between a pair of quilts, with his feet to the fire. 'If a man is a true artist,' he says, 'he ought to go in for it logically.'"

The accuracy with which Master Georgius passes judgment on an antique dish at Mount Medusa, the very remarkable residence of the Ambassador Extraordinary, can hardly fail to interest lovers of old china.

"'It is a beautiful thing,' says Mr. Gay, 'beautiful!'

"'Very fine,' says Master Georgius; 'magnificent in fact!'

"'What do you make of it?' inquires Viscount Malign.

"'Do you think it can be Early Greek?' suggests Mr. Gay to Master Georgius.

"'No, it ain't,' says the architect; 'more Oriental than Greek.'

"'Assyrian perhaps,' says the Emeritus Professor.

"'Well, there's something in the border, you know, that I should call Assyrian,' says Georgius; 'but that's not of so much moment. Now, what do you say to its being the Adoration? Those three fellows are the Magi, you know; and if you'll look close you'll see that they all carry some kind of astrological instruments in their hands.'

"'Perhaps, sir,' interposes Count Oberon with the sweetest of smiles, while the Professor is again scrutinising the Magi, 'perhaps the gifts that are spoken of?'

"'No they ain't; the gifts are in the boat, you know; they follow by sea while the Magi come by land.'

"'*Mal de Mer*,' suggests the Viscount.

"'Now don't! that's not archæology, it's ribaldry; but the style of the bridge is Roman, and that's very curious—semicircular arches, you know. And so it is in all the buildings, you'll find. But not in the cabins on the boat. They are of a different architectural style; the boat comes from the East.'

"'What are these?' says Viscount Malign, pointing to the pair of birds suspended in the air.

"'They are the heavenly host,' says Georgius; 'that's easily seen by anybody.'

"'Oh,' says the Viscount Malign, 'very likely.'

"'Yes,' says the Count Oberon with the sweetest of smiles, 'very likely indeed.'

"'Then,' says Mr. Gay, 'this tree with the globular fruit might possibly be the tree of the knowledge of good and evil.'

"'Certainly,' says Viscount Malign; 'the fatal apple hanging in whole hundred-weights, to signify the strength of the temptation.'

"'To be sure,' says Count Oberon, with the sweetest of smiles.

"'And this other tree,' continues Mr. Gay, 'this one in the centre, overshadowing the bridge and the three figures—this might be the tree of life.'

"'And its ragged condition,' continues the Viscount, 'would signify how persistently mankind have been snatching at its branches for six thousand years. It is almost torn to pieces.'

"'And all to no purpose,' says Count Oberon, with the sweetest of smiles.

"'Well, it's a very interesting thing,' says Mr. Georgius; 'magnificent! There's more yet. Look at this little edifice in front of the Magi; that's the stable, you know; you can see the horse-shoe nailed up over the door.' Master Georgius at last drops his eyeglass, which he seldom keeps fixed so long."

Later on, Georgius goes in "for Universal Gregorianism," and gets a commission to build a Roman Catholic Church.

"No church can, in his opinion, have any pretension to the possession of the authentic spirit of the old men unless it has a round tower. Artistically considered, the effect of round towers is magnificent; and historically they take you right back to the fifth century. He is sketching out something for All Saints and Angels, you know, which will outstrip everything that has ever been done in that way. It is after a leading example which he mentions; comparatively late it is, but so much the better; it's tremendously magnificent! There ain't a window in it all up and down, except one about two feet high and a foot wide about half-way; the effect is the finest he ever saw; the whole thing goes aloft like an engine-chimney, without a line of ornament upon it—magnificent! If there's anything he hates it's ornament; any fool can do what he likes with ornament, but it takes a man with some brains in his head to do what he likes without ornament."

The following is his reply to a remonstrance ventured by one of the parties concerned:—

"'Of course,' is the architect's reply, refixing his eyeglass, 'any fool can see that.' He abandons all his plans, of course. 'In fact,' says he enthusiastically, 'we're in this position you know; you'll see the force of it in a moment, all of you; you can't help seeing it. Here we are with the tower: I shall go in for building it quite rough on purpose and have it washed over with something—that's matter of detail, you know—to produce fungus or moss, or lichen, or whatever you choose to call it; and I shall plant things in the crevices as we go up—wall-flowers and house-leek, and ferns, and couch-grass, and all that kind of thing, you know.'

"'But what is all that for?' says Mr. Dodd.

"'What is it all for?' says Master Georgius, dropping his glass. 'Why, what could it be for? To give authenticity to the tower of course! Well then we've got our tower genuine to begin with—fifth, say sixth, century. Then our chancel is, as you say, at the other end; it's genuine thirteenth, early thirteenth, in fact. Well, what follows? why, anybody can see that the nave has been very much earlier, and has fallen down. I don't like to restore it in eleventh, so I won't go in for that; I'll try a mean.' Refixing his glass again, the artist looks around him with unusual defiance.

"'What is that?' says Sir Constantine.

"'Add them up and divide by two, you know. Six and thirteen—or rather five and a half, I should say, and twelve and a quarter—make seventeen and three-quarters; divide by two, and you have eight and seven-eighths, which is very late ninth, you know. Then the next step——'

"'I should say,' interposes Mr. Dodd, 'the next step would be to add east and west together and divide by two for an average.'

"'Now then; that's not so clever as you think it.' The architect drops his glass. 'At any rate, I'll go in for long and short work, and all that kind of thing; nobody else can make anything of it, but I shall make something magnificent; you see if I don't. My mind's quite made up.'"

As the Church progresses, the ecclesiastics seem not altogether enraptured with the primitive accommodation provided by their architect in the conventual establishment in connection therewith.

"'Your rooms,' says Monsignore, 'seem to me to be made almost as uncomfortable as they possibly can be.'

"'Why, of course!' exclaims the astonished artist, fixing his glass somewhat indignantly in his eye, 'what you call uncomfortable I call quaint.'

"'Very possibly I should call it the same; but, my dear sir, *cui bono?*'

"'*Cui bono!*' answers the architect contemptuously; 'that's what all modern people say; that's the horrible mistake of the whole modern world; we shall never recover the tone of the old men till we get rid of such jargon. Now, just for an instant imagine the fathers of this Abbey of ours going in for wash-hand-basins!' He drops his eye-glass in sheer dismay at such an idea."

Georgius is willing to allow soap—"that ain't architecture, you know,"—but he insists on going in heavily for squints, squinches, and slypes, and, above all, for several bartizans, "so as to command the slypes," and provide "for pouring down melted lead upon the assailants." What assailants?" asks the Monsignore.

"'Why, any assailants; nobody in particular, but anybody that comes. We shall have riots, you know, before long, as the end of all this.' (Here Master Georgius drops his glass thoughtfully.) 'The modern spirit of the day will be revolting, reacting, and all sorts of things, before we are able, you know, to stand in the ancient ways—any fool can see that; the passions of the mob, you know, are going to be aroused and so on, and then we'll pour melted lead upon their heads, you know, and let fly at them with cross-bows.'"

Monsignore, to the horror of the architect, suggests a few plain modern chambers with a neat paper on the walls, but as the latter assures his brother, the Reverend Theo, who is a fine specimen of the modern Mediæval curate, he won't get them. Georgius means above all to have his own way with the refectory.

"'I'm going in for doing it inside in red brick, and vaulting it in red brick too, with black diaper patterns all over, you know——'

"'How pretty!'

"'I hope not!' (Dropping his glass.) 'The diapers will be quite irregular and full of what you would very likely call mistakes——'

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* The Ambassador Extraordinary. London: Richard Bentley and Son.

"'A sort of intentional accidents, George.'

"'Yes, not a bad term. And then the joints will be all raked out roughly, and the brickwork smeared, you know. I have quite a new idea about that. I mean to go in for letting the workmen have the use of all the rooms, with liberty to smudge them as much as they like, and so at the end we shall have a sort of antique effect, you know.'

"'They will be dirty.'

"'You may call it dirt,' says Georgius, refixing his eye-glass, 'I call it Art. And there will be marks here and there where the fellows have lighted fires, you know.'

"'And caricatures on the walls, I suppose.'

"'Of course. I shall go in for that very much. I shall offer a prize for the quaintest. I'll have them done with a brush of paint, you know, or scratched with a screwdriver and so on. I call that real art.'

"'So it is, George.'

"'And smudges of candle-smoke everywhere; and grease, and all that sort of thing. Well, then here's the dormitory; that's in yellow brick, with white ones and red ones and so on intermixed at random. Magnificent!'"

Lamentable to relate, the Abbey Church on which all this wealth of fancy is spent is ultimately destroyed by fire, thus dashing to the ground the hopes we had entertained well on into the third volume of finding an illustration of the completed building, which we might have reproduced for the benefit of admiring readers. The catastrophe is too much for Georgius, who gives up Gothic in disgust, and expresses his determination to go in for Greek, "the real antique after all," just about the time the Reverend Theo, weary of his search for authority and stability in Anglicanism, and after casting wistful glances at Mahomedanism and Judaism, is off to Egypt to seek rest in the Egyptian Church and be a priest of the Sphynx.

One or two other characters are fairly sketched, but Georgius is really the hero of the book—an "Ambassador Extraordinary" of some hints to a few of the author's brethren, which he has offered for their consideration in other places and on other occasions, when, perhaps, they have been less inclined to listen than they will be now, when they may laugh at the same time.

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NOTES FROM EDINBURGH.

THE summer, so disappointing in other respects, has been favourable to the builder, and the three principal undertakings now going on within the city have made good progress. Not the least interesting is the work of restoring the interior of St. Giles's Collegiate Church. The choir was completed some time ago, and a clearance is now making in the south transept and its aisles. The work has proceeded far enough to give some idea of the true proportions of the choir and the character of the original design. Standing where the high altar was placed, and looking beyond the choir into the chapels of the Preston aisles, if the apparent magnitude of the choir suffers diminution, the extent of the interior and something of its ancient aspect are made evident, and the spectator is at once impressed with the grace and lofty proportions of the piers and vaulting thus disclosed to view. The work has been a heavy one, not merely by necessary removal of modern obstructions, but by the considerable repairs required upon the pillars and parts of the wall, and it will yet be some time before this transept can be completed with its furniture and added to the choir for service.

The restoration of 1829, by Mr. Burn, was not conservative. It involved the destruction of all that was characteristic of the original exterior, and a complete remodelling of the design, in order to bring it as far as possible into the orthodox form of a cruciform church. He had also to provide accommodation for three separate congregations, and consequently was obliged to cut and carve in a manner that would be considered mortal sin in the eyes of the antiquarian restorer of these later days.

The ancient church, more so than any other sample of its kind, was anomalous in its external aspect, and deserved a better fate. This character was impressed upon it, partly by the conditions of its site, in the heart of a crowded town, partly by the vast number of altars and chaplaincies requiring accommodation in a limited area, and which were gradually added, to the number of 40, by the piety of the age. The history of its alterations and additions can be read, partly on its walls and piers, and also in the records of council and the State papers; and much interesting information can be obtained in a small pamphlet recently published by Dr. Chambers, entitled "The Story of St. Giles." The principal additions to the church of the 13th century were made about the close of the 14th, when five chapels were added to the south of the nave, which had the ordinary vaulted aisles of the period. The interior, however, was much enlarged and improved by alterations made after the middle of the 15th century, when a clerestory was added to the choir, and the present elegant vaulting completed. Two bays also were added to the length, of greater width, to accommodate processions behind the high altar. This addition is observable in the clustered pillars and plan of the piers, which are light and elegant beside the octagonal columns of the earlier work; and the richly-carved heraldic capitals contrast strikingly with the simple mouldings of their neighbours.

The Preston aisle, of two bays, was also added at this time to the south of the choir, and a smaller addition, known as the Albany aisle, with vaulting on a central pillar, was built on the north side of the nave. The Preston aisle is the portion which it is proposed to make available for increasing the accommodation of the present choir.

Externally, this old church was cruciform, with a central tower surrounded by, or rather buried behind, a crowd of transepts and aisles of longer and shorter projection, with varied tracery, crowstepped and other gables. There was till close of eighteenth century a very fine specimen of a Norman doorway, and the south porch, with priests' chamber and oriel, survived till a later date.

Everything—but the old tower and crown spire—that was characteristic and picturesque about the exterior was swept away by Mr. Burn, who destroyed two of the five chapels built in the fourteenth century, the south porch with its chamber and oriel, closed the north doorway, and added doors and porches of his own, giving a clerestory and plaster vaulting to the nave, and making all windows of similar design and of Flamboyant tracery.

Although nothing in the way of restoration can now be done for the exterior, which has none of the elegance of the Later Gothic, though executed with much of its commonplace detail, it is evident that much may be made of the interior, and it is very desirable that funds should be forthcoming before 1881, to enable the congregation now requiring the nave for their accommodation, to rear another edifice, and give Dr. Chambers an opportunity to finish the work he has so far accomplished, and which he has generously offered to complete at his own expense. The work may well command the sympathy of the antiquarian and the architect, and its historical associations are many for the general public—and should the work of restoration be happily completed, the interior, at least, will present a very unique and interesting specimen of the architecture of the past.

The church is open to the public at present, and they are politely requested by placard on entering, to take off their hats before purchasing any of the photographs temptingly displayed at the receipt of custom set up within the aisle.

The cathedral church of St. Mary is very nearly completed, in so far as the work contracted for at present is concerned. The vaulting of the crossing and the choir is finished in concrete within the moulded ribs, and the surface of the cement is of a pale red, being treated with a mixture of brick-dust. The iron screen-work is being fitted, and the reredos of white and red veined marble is now erecting. Sheds are being removed, and the work of the parapet wall will be presently begun. Some noticeable features of materials used in the construction may be given. The dressings are from Polmaise Quarry in Stirlingshire. There are several quarries in this district, which supply a great proportion of building stone to Edinburgh. The sandstone is of the Carboniferous series, and in Polmaise varies from a light yellow to a reddish or orange brown as it comes from the quarry. It is not very fine in the grain nor very hard, but is well adapted for the work of the chisel. It is also very durable, though some of the beds yield a stone which rapidly disintegrates. It retains its colour, which becomes a warm grey, harmonising well as a dressing with almost any stone that may be put beside it.

The rubble of the walls outside and inside is of white Hailes stone. This quarry has for many years superseded the Craigleith. It contains a much greater variety of material, from soft blue carbonaceous beds to the hardest red and white rock. In all varieties there is more or less of carbonaceous matter, which has been quietly deposited, and gives it a laminated structure extremely advantageous to the builder. It supplies very flat foundation stones of any size, and the pavement slabs, though very absorbent, are very durable for out-door work. The quarry supplies stone in large quantities, also for rubble coursing of the description known as natural-faced. Its extreme hardness makes it split readily with a level, clean fracture, exposing a white surface of great beauty, which, however, soon loses this character, and becomes a dusty brown, owing probably to the number of minute particles of carbonaceous matter permeating its structure. This stone has of late years been in great demand, since the Scottish Baronial became popular in street and villa architecture, and it is universally used for Gothic churches. It makes a surface of much artistic merit, when the manner of arranging the courses has been carefully studied. In the Cathedral of St. Mary, perhaps the most striking and indeed unique characteristic of the masonry, is the small size of these courses, as well as of the dressings. The rubble may average 4½in.—with exception of an occasional stone of greater depth, from which a fresh combination of the courses start. In Scotland, the size of the rubble stones is considerably larger, and in random coursing the levels of unequal size are made continuous, not by larger stones, as in St. Mary's, but by very much smaller stones than the rubble, called technically "snecks," and the work is known as snecked rubble. The system (adopted in the cathedral) of using material of little size is some security for even fracture, and avoids thus anything approaching the character of "bull-nosed" rubble, which is not consistent with the chiselled dressings.

Polished ashlar of Bath stone has been employed in the spandrels of the large arches of the church, and the shafts of the principal doorways and figure canopies of the spire are of polished Shap granite.

The interior roof of the nave is constructed of oak boarding, in the form of a pointed vault, supported on very massive moulded transverse principal and subordinate ribs, with diagonals resting on clustered vaulting shafts. These principal ribs are bolted to the main trusses of the roof, which are constructed of very large scantling to last for centuries, with a simple collar at apex of the oak principals below. The trusses are covered with slate boarding, on which the slating is put without felt or plaster.

The slating is from a Perthshire quarry, Craiglea, and is of a greenish tint, more apparent when the surface is wet. This quarry is better opened up lately, and yields two varieties of slate of the best quality—a blue and green. The blue is properly a bluish-grey. The new Royal Infirmary has been slated with this variety, and has a soft silvery-grey appearance, which is greatly in its favour, as compared with the blue and purply-red varieties of slate. The grey, when dry, has a very neutral tone, and the most striking characteristic of both is the perfect uniformity of colour so easily obtained. The late Sir Gilbert Scott was so much pleased with this slate that he resolved to specify it for the restoration of St. Alban's Church.

The new University buildings are making good progress, and the southern section is now ready for the roof. The western frontage is much more ornamental in its design than the southern. The masonry is polished ashlar courses with indented joints; and the large circular projections add much to the picturesque appearance of the design, which is not lofty in its proportions. The most ornamental part of the building is not yet commenced.

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A memorial font is about to be placed in St. John's church, Moulsham, Chelmsford. The approved design, which has been prepared by Mr. Joseph Clarke, F.S.A., diocesan architect, shows a massive bowl of Caen stone supported by shafts of red Devonshire marble, with Painswick caps and bases and a platform of Portland stone.

An exhibition of sanitary appliances and articles of domestic use and economy is to be held at Croydon in connection with the autumn congress of the Sanitary Institute of Great Britain, from the 21st October till the 8th November.

OUR COMMONPLACE COLUMN.

HEAD OF WATER.

It is convenient in hydraulic questions to express the pressure of water in *feet* of water, that is, in terms of the intensity of the pressure of a column of water one foot high upon its base as a unit. This is sometimes called a "head of pressure." The weight of pure water is 62·4lb. per cubic foot, which is almost exact at a temperature of 52°.3 Fahr. The total head of a given particle of water is found by adding together the following quantities: the *head of pressure* expressed in feet of water, and the *head of elevation* or actual height of the particle above some fixed or datum level.—(See Rankine's "Civil Engineering.")

ICONOCLASTS.

This name is frequently found in works treating on the history of art, and designates those who in the church, from the 8th century, have been opposed to the use of sacred images, statues, pictures, &c. Image-worship prevailed extensively in the 6th and 7th centuries, in the Eastern Empire especially, it is said. The iconoclast movement began with the Imperial edict issued in 726 by the Emperor Leo III., surnamed the Isaurian, forbidding the honours paid to sacred images, and even commanding the removal from the churches of all representations, that of our Lord alone excepted. This was followed by other decrees still more prohibitive.

IMPOST,

A term used chiefly in Classic architecture to denote the horizontal suites of mouldings of piers and pilasters from which an arch springs. Imposts have been judiciously divided into *continuous* and *discontinuous*, the former term intended to designate the variety of arched openings in which the arch members are continued without interruption to the base, and the latter to designate those with caps or mouldings.

INLAYING

Is the art of decorating flat surfaces by the insertion of similar or different materials; Marquetry is now generally applied to inlaying in woods. We have also Damascene work, when steel is inlaid with gold or brass. In one kind of inlay of this sort, produced in India, and called Kuftgori, the inlaid metal, usually gold, occupies more of the surface than the metal forming the ground. Bedery work is another beautiful variety in which the article to be inlaid is made of an alloy of 1 part copper and 4 parts of pewter. This is easily cut, the pattern is then engraved, and little pieces of thin silver, cut to the desired forms, are hammered into the spaces thus cut out to receive them. Inlays are made of various substances—ivory, shell, tortoise-shell, pearl, stone, and marble. The *pietra-dura* of the Florentines is a notable stone-inlay, black marble being inlaid with brilliant coloured stones. Beautiful work surpassing, it is said by a writer in Chambers's "Encyclopedia," the Florentine, is now made in the Imperial works at St. Petersburg, where the art has been sedulously cultivated by the Russian Government. In Indian work white marble forms generally the ground, the patterns being formed of jasper, cornelian, agate, lapis-lazuli, and other precious stones. The walls of the Taj Mahal at Agra are inlaid with most beautifully-executed and artistic designs of harmonious colour. Architectural inlaying is common in Italy. "The cathedral, baptistry and other buildings in Pisa and Lucca, are built both inside and out with white stone courses, with thin courses of black marble occurring at about every fourth course." At Genoa, Siena, and other places, the same kind of relief by black and white courses is observed; sometimes red, white, and grey marble, as in the porch of Sta. Maria Maggiore, are found combined. In this case the colours are divided into three stages, and the groining is formed of diamond-shaped panels of red, black, and white marble. The campanile at Florence is another very fine example, the materials being red marble, green serpentine, and white marble. These are relieved by inlaid patterns in delicate marble mosaic. Many of the French churches are decorated with inlaid ornament, such as those in the Puy de Dome; the walls have a diaper in mosaic, and the voussoirs are alternately of dark and light stone. (See "Encyclopedia Britannica," Art. "Architecture.") Inlaying in wood was introduced from India and Persia into Italy about the end of the 14th century. The Venetians produced at this time some very beautiful geometric patterns in which the inlays were of ivory, metal, and woods stained. At the South Kensington Museum may be seen some chairs of this date. About 1500 the Geometric style attained great richness, and figure designs began to be introduced. Pine and cypress were largely used for this purpose, the large grain being employed to express the lines of drapery. This sort of inlay is called "tarsia," a kind of mosaic in woods. Perspective representations of buildings were commonly introduced, as the straight lines and rectangular openings were readily cut in the wood; relief and shade were given by lights and shadings. In the Italian churches, this kind of work may be seen in very fine fittings to the choirs. Inlaid work was introduced into England in the time of Elizabeth, and woods of various colours were inlaid in oak, but good examples are rare. Heads and testers of bedsteads, chests, &c., were ornamented with inlay of woods coloured. From the middle of the 16th century to 1700, marquetry began to be largely used for ornamentation of furniture. Holland produced some of the best artists in this work, and in the reign of William and Mary we find a large quantity of furniture was imported. Dutch marquetry soon became the fashion, and bureaux, secretaires, clock-fronts, chairs and tables, were adorned with flowers, foliage, and birds. The tulip was a commonly introduced flower in articles of furniture of this date, and we find it on the fronts of clocks, on bureaux tables. The woods were often stained bright colours, relieved by ivory and mother-of-pearl. Boule marquetry was introduced into France by Andre Charles Boule about 1680. It is a veneer composed of tortoise-shell and thin brass. Two or three thicknesses of the material are glued together, and sawn through at one operation, by which an equal number of pieces were obtained which could be combined to form a variety of designs. The brass thus forms alternately the ground and the pattern, and is afterwards richly chased. During Louis XVI. there were many celebrated artists in furniture, chief among them being Riesener and Goutière. The designs of the marquetry were of the most beautiful description, chiefly composed of flowers and wreaths exquisitely finished in rosewood, tulip, maple, &c., set in the centre of a plain panel or surface of one wood. Examples of all these styles of inlay may be seen at South Kensington Museum. For further information we refer the reader to J. Hungerford Pollen's "Ancient and Modern Furniture and Woodwork," and to the art handbooks of the South Kensington Museum, published by Chapman and Hall.

INTAGLIA.

Ital., "cutting in," a term used in art, the opposite of relief. It means the representation of a subject by hollowing it out in a gem or other substance, so that an impression taken from it has the appearance of a relief.

INTERCOLUMNIATION.

A term used in Classic architecture to denote the distance between the columns of a building measured at the bottom of shaft. It varies in different temples, the most pleasing intercolumniation being 2¼ diameters. Vitruvius describes five species of intercolumniation for the "five sorts of edifices," which he lays down. These are pycnostyle (Gr., dense, and a column), thickly set columns, or 1½ diameters; systyle, rather thickly set, a space of 2 diameters; diastyle (Gr., through, and a column), a spacious intercolumniation of 3 diameters; aræostyle, a rare or wide intercolumniation; and eustyle (Gr., well, and a column), a species of intercolumniation to which 2¼ diameters are given. The subject is fully discussed in Vitruvius; but no definite rule can be laid down, the only principle to guide the architect being the purpose and expression of his building.

IRISH LAKE DWELLINGS.

The lake dwellings or crannoges of the British Isles are artificial islands. They occur at Leitrim, Roscommon, Cavan, Down, Monaghan, Limerick, Meath, King's County, &c. Lyell says forty-six examples of these islands have been discovered in the Irish lakes alone. Sir Digby Wyatt describes one class of these islands as formed by placing horizontal oak beams at the bottom of the lake into which oak posts from 6 to 8ft. high were mortised, and held together by cross beams till a circular inclosure was obtained. An inclosure of 520ft. diameter thus formed at Lagore was divided into sundry timbered compartments which were found filled up with mud or earth, from which were taken vast quantities of the bones of oxen, swine, deer, goats, sheep, dogs, foxes, horses and asses. All these were discovered beneath 16ft. of bog and were used for manure. Antiquities referable to the age of stone, bronze, and iron were also obtained from Lagore. We refer the reader to the *Archæological Journal*, Vol. VI., *Archæologia*, Vol. XXVI., and to Lyell's "Antiquity of Man."

CHIPS.

The church of Childe Okeford, Dorset, was reopened on Wednesday, after having been restored under the superintendence of Mr. T. H. Wyatt, of Great Russell-street. The chancel has been paved with marble by Messrs. Earp and Son, who also supplied the pulpit. Three stained windows have been placed in the chancel and one in the south aisle. Mr. A. H. Green, of Blandford, was the builder.

On Sunday week All Saints' Church, Hatcham-park, S.E., was reopened after renovation, including the additions of a brass lectern, oak font cover, and scroll texts upon the walls.

The assembly room of the county hall at Lewes has been decorated in colour from the designs of Mr. H. Card, county surveyor. The work here and in other parts of the county hall was carried out under contract by Mr. J. Punker, of the Cliffe, Lewes.

One of the most extensive conflagrations ever witnessed in Wolverhampton broke out late on Tuesday night in the extensive galvanising works of Messrs. Davies Brothers, Crown-street, in that town. The damage will amount to some thousands of pounds.

The Rev. Alfred Earle writes from Fovant Rectory, Salisbury, to the *Guardian*:—"On the gable end of the roof of the south aisle of St. George's, Fovant, is an ancient stone cross with a horseshoe in the centre. Can any of your readers give any explanation of this? I have made many inquiries, but have hitherto failed to get a satisfactory answer."

A coffee-palace and temperance-hall, adjoining the South-Western railway-station at Exmouth, were opened on Monday. The premises have been built on the site of cottages, and consist on the ground-floor of bar, dining-room, kitchen, smoking-room, and youths' reading-room, behind which is a hall 45ft. by 27ft., capable of seating 300 persons, and two ante-rooms. At the back of this is a billiard-room, 27ft. by 21ft. On the first-floor is a reading-room, 24ft. by 12ft., with library of 500 vols., a coffee-room, two games'-rooms, a committee-room, and three sitting-rooms. On the second-floor are 13 bedrooms. The total cost of building and furnishing has been about £3,000. Mr. Frank Carter was the architect, and Mr. H. Perry the builder.

The Plymouth Town Council decided on Wednesday to hang the picture representing "The Execution of Lady Jane Grey," recently presented to them by Mr. Solomon Hart, R.A., in the western law court of the new Guildhall, immediately behind the judge's seat.

Lady Lindsay of Balcarres opened an exhibition of old embroidery at the schoolroom, Colinsburgh, Fifeshire, on Monday. The designs include English, Italian, and Oriental work, and the display is a large and interesting one.

A new pier in Pegwell Bay and a large swimming-bath were opened by the Chairman of the Ramsgate Improvement Commissioners on Tuesday.

The hall in which the Northern Meetings are held at Inverness has just been decorated in colour, renovated, and improved at a total cost of £2,000. Mr. Lawrie, of Inverness, was the architect, and Bailie Macdonald took the contract for painting and decoration.

The War Office Department have just acquired land adjoining the new barracks at Limerick, on which they propose to erect additional cavalry barracks and quarters for married soldiers at an estimated cost of from £30,000 to £40,000.

The Town Council of Glasgow on Monday, after debate by adjournment on the advisability of providing separate drains for water-closets and polluted water, remitted the question to Mr. Carrick, city surveyor, with instructions to report upon the matter.

A new school opened by the London School Board in Berger-road, Homerton, was opened on Monday week. It has been built from the plans of the architect to the Board, and provides accommodation for 1,200 scholars.

COMPETITIONS.

Woolwich.—Messrs. R. Norman Shaw, R.A. J. L. Pearson, A.R.A., James Brooks, E. F. C. Clarke, Wm. Young, and J. W. Walter, of Woolwich, were, we believe, recently invited to furnish designs in a limited competition for the rebuilding of St. Mary's Church, Woolwich. The former two architects above-named, and also Mr. Young, declined to compete, but the other three gentlemen have now sent in designs or are about to do so. Messrs. Wm. Young[*] and E. F. C. Clarke[†] had already made designs for the alteration of the old church, and both these plans have been published in the Building News, Mr. Clarke's drawing being hung at the Royal Academy this year. Two years ago it was proposed that Mr. Young and Mr. Arthur Blomfield should compete together for the work, but for some reason the proposal fell through. This was after Mr. Young had prepared his designs for the alterations of the existing building. It cannot be regretted that the ugly old church is now to make way for a new one, and we hope, whichever architect obtains the commission, that a building worthy of the site and parish will be erected. We trust to review the drawings before an award is arrived at, though we hear with satisfaction that the assistance of Mr. Arthur W. Blomfield, M.A., is likely to be obtained by the Church Committee as professional referee. Part of the scheme is said to be the "Princess Alice" memorial, which is in the form of a Celtic cross, to be erected in the churchyard, in memory of those unfortunate people who lost their lives in the Thames disaster of last year. Mr. William Young is the architect for this work, which is being executed by Mr. East, of Lambeth, at a cost of £500.

CHIPS.

The improvements now being carried out by the Metropolitan Board of Works in the angles of streets converging at the "Angel" were sharply criticised by the members of the Clerkenwell Vestry on the 11th inst. It was stated by several speakers that after the work has been completed and the pavements widened, the carriageways will be very little, if any, wider than at present, and it was insinuated that the chief aim of the Metropolitan Board was to get as large frontages as possible rather than to increase the public convenience. The works, which, it was stated, will cost £60,000, are temporarily suspended.

The Berkshire Archæological and Architectural Society made an excursion on Wednesday week to Hagbourne, Cholsey, North Moreton, and Wittenham Clumps, under the guidance of Mr. James Parker, F.S.A., of Oxford, who pointed out at Wittenham a clump which he held to have been a British camp. A paper was read by Mr. H. Stapylton, of Barnet, on North Moreton parish and church.

Mr. S. C. Hall unveiled on Sunday a memorial window to Thomas Moore, the poet, in Bromham Church, Wilts. The subject is "The Last Judgement."

The archdeacons and rural deans of York at a recent meeting appointed Mr. C. R. Chorley, architect, Leeds, the second diocesan surveyor for dilapidations, in conjunction with the present surveyor, Mr. Ralph Nicholson, of Parliament-street, Westminster.

The interior of Holy Trinity Church, Penge-lane, S.E., has recently been embellished by the completion of the mural decorations initiated in the chancel, and by the addition of a traceried organ screen. The colouring is for the most part in the dull red colour of 13th century decoration, harmonising with the style of the church. It has been executed by Messrs. Rubardt and Son, of Wells-street, Regent's-park, from the designs and under the superintendence of the architect of the church, Mr. E. Francis C. Clarke, of Serjeants' Inn. The church was reopened on Sunday week.

The foundation-stone of a new Episcopal chapel was laid at Fort William, N.B., on Friday. The architect is Mr. Ross, of Inverness, and the anticipated cost of the building is £5,000.

The members and associates of the Society of Engineers will visit the works of Messrs. H. Bateman and Co., in Pelton-road, Greenwich, on Tuesday next, where the various works in connection with the manufacture of silicate stone will be shown, as well as those connected with the manufacture of emery grinding and polishing wheels and machinery.

Building Intelligence.

Derby.—A central Primitive Methodist Chapel was opened at Greenhill, Derby, on Sunday week. It is in the Italian style, and has been built from the designs of Messrs. Giles and Brookhouse. The external walls are faced with white bricks, and have terra-cotta enrichments and stone dressings. On the south front are two towers, finished with spires rising to 72ft. in height. The accommodation, including gallery, is for 800 persons. The pews are of red deal, varnished; the pulpit is of pitch-pine, stained and varnished. The windows are of stained-glass, and the ceiling is moulded and coffered. Beneath the chapel are the school and class-rooms. Mr. George Pemberton, of Melbourne-street, was the builder, and the total cost has been about £4,000.

East Worthington, Devon.—The ancient parish church of St. Mary, East Worthington, having been nearly rebuilt, the reopening took place upon Sunday, Sept. 14th. The work, which has been carried out under the superintendence and from the designs of Messrs. Clark and Holland, architects, of Newmarket, Cambridgeshire, has comprised the entire rebuilding of all the church save the chancel, and to that a great deal has been done. The structure consists of nave, chancel, and a western tower, some 40ft. high. The church is very small, only accommodating eighty, but the parish itself musters but 250 inhabitants all told, so that it is sufficiently roomy for the requirements of the place. The work of restoration has occupied nearly two years. The chancel work has been done at the vicar's expense (Rev. W. M. Bruton), by Mr. Wm. Parish, builder, of Witheridge, and Mr. Selby, builder, of the same place, has done the nave and tower. This part has been done at the expense of the Earl of Portsmouth. Four bells have been hung in the tower by Mr. Moses Luxton, of Winkleigh.

Iddesleigh.—The reopening services of Iddesleigh Church, near Okehampton, Devon, which has undergone a most satisfactory restoration, were held on Tuesday. The parish church is dedicated to St. James the Apostle, and is a neat structure with tower containing four bells, the interior consisting of nave, aisles, and chancel. The church was built towards the latter end of the fifteenth century, probably about A.D. 1485 to 1490, but the only portions of the original church which now remain are the tower, the arcade between the nave and aisle, the beautiful roofs and the magnificent rood screen. These are all of very great beauty. About 1720 the walls of the church were partly rebuilt, the east window destroyed and built up, and the whole of the east wall was covered with wood panelling in the tasteless style of the Georgian era, and, to prevent the loss of light caused, a large square-headed window was inserted at the eastern end of the south wall of the chancel to give light to the altar. This is supposed to be all that was done to the church at that time; but a worse fate was in store for it, for in the years 1816, 1817, and 1818 the whole of the north-east and west walls of the aisle were taken down and rebuilt, the windows on the north side being replaced, happily just as they were, except that every portion of the ornamental cusps were most carefully cut out and destroyed, and at the same time the beautiful chancel arch and the corresponding arch between the aisle and chancel aisle were entirely removed, rough beams of timber being put in their places to keep the arcade from falling over from the weight of the roof; but, notwithstanding this expedient, the arcade between the nave and aisle fell over towards the nave, at least from fourteen to fifteen inches. However, badly as the northern side of the church was treated, the treatment of the south side was even worse. The church now, however, with the exception of two windows at south-west of nave, and another in the tower thoroughly restored to its original beauty. The whole of the old box pews and the west gallery have been removed, and the body of the church seated with open benches of oak of rich design. The arcade has been brought back to the perpendicular and the foundations carefully underpinned. The chancel arch and the corresponding arch in the aisle have been replaced. The south and east walls of the chancel have been rebuilt and are pierced with fine windows of a date corresponding with the rest of the church. The whole of the north windows and the south windows of the nave have new tracery worked in exact accordance with the remains of the old tracery. The whole of the roofs have been replaced in their original position and boarded with oak boarding, all missing parts of the cornices and ribs having been carefully replaced with new, worked to match the remains of the original portions. The church roof, which was propped up with rough timber, is now supported on stone corbels of angels holding shields, bearing the emblems of the Passion, &c. The remains of the rood-screen, which could not be placed in its original position owing to want of funds, now forms a parclose screen between the chancel and chancel-aisle. The whole of the work has been carried out by Messrs. Medland, Grant, and Eastmond, builders, of Great Torrington, from designs and under the personal direction of the architect, Mr. Charles S. Adye, of Bradford-on-Avon, near Bath. The stone carving has been done by Mr. Harry Hems, of Exeter.

Ilkley.—The new church of St. Margaret, at Ilkley, was consecrated last week. The church, which was illustrated in the Building News of May 18, 1877, is designed by Mr. R. Norman Shaw, R.A. It is in the Transitional style of the 13th and 14th centuries, treated in a free manner, and consists of nave, aisles, north and south transepts, chancel, and square east end. It is lighted with mullioned expanding windows, set high in the walls. The roof, which is supported by six arches, is an open "tie-beam," constructed of pitch-pine, unstained. The total length of the building is 142ft., width, 65ft., height from floor to roof 40ft. It will seat 1,000 persons. The features in the interior are the breadth and openness of the central aisle (which is as wide as that of some cathedrals, 28ft.), the wide span of the nave arches (25ft.), and the east and west windows, which show the transition between the Decorated and Perpendicular styles. A prominent feature in them is that of having a larger number of lights than any similar window in the county—ten under one arch. The north transept is converted into an organ-chamber. Externally the chief feature is the porch, and the blending of of the flat roof (only broken by a double bell-cote marking the chancel separation), with the background of moorland. Mr. Prior acted as clerk of works, and the contractors were:—Masons, Messrs. Whittaker Bros., Horsforth; joiners' work, Mr. John Hall Thorp, Leeds; plumbing, Mr. Towers, Burley; and plastering, Messrs. Cordingley and Sons, Leeds. The chancel decorations and altar fittings have been executed by Mr. J. A. Heaton, of Finsbury-square, London.

Killinghall, Harrogate.—A Wesleyan chapel and Sunday-school, built at the Harrogate end of Killinghall, were opened on the 12th inst. The building is of stone obtained from a local quarry. The style is Gothic, with bold details. From the principal porch the gallery, which occupies three sides of the building, is reached by flights of stairs to right and left. The platform, pews, and all interior woodwork is of pitch-pine, carved and decorated and varnished. The chapel will accommodate 250; and in the school, which forms part of the main building, from 80 to 100 children may assemble in classes. The cost has been £1,200. The architect is Mr. Wm. Croft, Killinghall, and the contractors are Mr. James Simpson, jun, Harrogate, masons' work; Mr. Wm. Granger, Killinghall, joiners' work; Messrs. A. Knowles and Son, Harrogate, painters' and decorators' work; Mr. John Baynes, Ripon, slaters' work; and Mr. Chas. Fortune, Harrogate, plasterers' work.

Leicester.—About two months since, the first part of the new baths erected by the Corporation of Leicester in Bath-lane was opened, and last week the remainder was handed over for public use. The accommodation provided is a first-class circular swimming-bath 40′ 6″ in diameter, with dressing-boxes, &c., attached: a second-class swimming-bath, 130ft. long and 24ft. wide, horse-shoe in shape, and running rather more than half-round the first-class swimming-bath, with dressing-benches, &c., attached, and space reserved for private dressing-boxes (this bath, opened about two months since, has already been used by 30,000 to 40,000 bathers). Private baths are also provided for both males and females, together with waiting-rooms and separate entrances for the different classes. Ticket offices, superintendent's residence, and boiler-house complete the present accommodation; but space has been reserved at convenient points for the extension of any part, and the Corporation are now proposing to utilise part of the reserved space by erecting a small wash-house for towels, &c., together with an extension of the filtering arrangements. Nine private baths are set apart for ladies. The general style of the building is Romanesque, freely treated, terra-cotta being largely used for enrichments. The cost of the buildings has been something under £10,000. The work has been carried out for the Corporation from the designs and under the superintendence of Mr. J. B. Everard, of Leicester, as engineer and architect; by Messrs. Bass and Langton, as the principal contractors, with Messrs. Lindley, stonemason; Ellis and Wormell, slaters; Smith, plasterer; Townsend, painter, all of Leicester, and Mr. Cordon, of Nottingham, excavator; as sub-contractors. Mr. Whitmore, of Leicester, was the contractor for the plumbing, &c., and Mr. F. Cox the carver.

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[*] Building News, May 24, 1878.

[†] June 6, 1879.

Sheffield. — Trinity Wesleyan Methodist Church, Highfield, Sheffield, will be opened next Wednesday. It is a Gothic erection in the Early Pointed style. The building is constructed of Dunford Bridge wall stone and Arlington stone dressings. One of the most prominent external features is the spire, rising to a height of 140ft. The roof, like the pews, is of pitch-pine. Schoolrooms and vestries are provided under the chapel. The schoolroom is 59ft. by 59ft. There are also four class-rooms, each 16ft. by 12ft., band-room 29ft. by 20ft., and a kitchen provided with a complete cookery and boiling apparatus. The architect is Mr. J. D. Webster, of Church-street, Sheffield. The cost is about £9,000, of which £1,000 is for the site.

St. Teath.—The two important works in which the vicar of St. Teath, Cornwall, is engaged, namely, the much-needed restoration of the ancient church of his parish and the erection of a new church in the populous district of Delabole, are making rapid progress. The parish church is so far advanced that it is intended to reopen it on the 6th of November. The endeavour in the restoration of the church has been to keep whatever is historically or architecturally interesting, whether of pre- or post-Reformation date. Gothic and Jacobean work has each a place, therefore, in this restored church. The aisles are fitted with benches made up chiefly of the old oak, and in the chancel stalls and other furniture the ancient materials are also employed. The nave will be occupied with chairs. Some of the walls were more than a foot out of the perpendicular. These have been made sound and straight, and the portions of windows which were decayed have been taken out and replaced with new granite or Polyphant stone. The new carving required is by Mr. Hems, of Exeter. The contractor for the restoration is Mr. Wiffin, of Bradford, North Devon, who is carrying out the work from the designs and under the direction of Mr. Hine, of Plymouth.

CHIPS.

On Tuesday Mr. Vivian A. Webber, of Ryde, Isle of Wight, presented to the mayor of that town, as representing the inhabitants, a marine painting, the work of Mr. Fowles, of Ryde, and executed on Mr. Webber's commission. The subject is the *Royal Charles* man-of-war arriving in Cowes Roads with the charter granted to the borough in 1681. Mr. Webber has already spent over a thousand guineas in this way, having given pictures to the towns of Ryde, Portsmouth, Ventnor, and Newport.

The Bishop of Oxford consecrated, on Tuesday, a chancel which has been added to St. Mary's Church, Newbury, from the designs and under the special supervision of Mr. G. E. Street, R.A.

On Tuesday a solemn requiem and high mass were held at St. George's Cathedral, Lambeth, over the remains of Mr. Edmund Reddin, jun., 46 years old, son of the well-known contractor of Southwark-street, Borough. The interment took place at Norwood cemetery.

The Old Northgate Hall, at Halifax, which for about twenty years has been used by a temperance society, has just been altered to serve as a sale-room. The alterations have been effected under the supervision of Mr. Buckley; the builder, Mr. Bancroft, of Halifax, was one of the men employed on the work in 1836-7, when the building was altered, from the designs of Mr. Harper, of York, from the hall of the Lister family into an hotel.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J, Passmore Edwards.

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S. D. (1. Yes, see indices. 2. There is no cheap treatise. Get Sir Gilbert Scott's lectures, recently published by Murray.)

"BUILDING NEWS" DESIGNING CLUB.

Omnia Vincit Labor. (In reply to your suggestions, we have only to observe the successful students in our club have been almost invariably under the age of 20. Men who have been 10 or 12 years in the profession have generally something more lucrative to do.)

Correspondence.

HULL ASYLUM COMPETITION.

To the Editor of the Building News.

Sir,—The writer of the review on the Hull Asylum plans, in his endeavour to explain the points in his notice of our design, to which we called attention (in a letter published in your issue of September 5) has, in your last number, repeated his previous statements, with some fresh allegations, to which we trust you will allow us to reply.

What we have stated in our letterpress as to the absence of a distinct corridor to No. 1 Block is clear, and the reasons for its absence we maintain are perfectly valid. The ward is intended for forty infirm cases. Of these an average of ten will be in bed always, ten or fifteen will be able to walk to the dining-hall for their meals, leaving fifteen or twenty to occupy the day-room (which room by the way is large enough for the whole number), and it is these fifteen or twenty cases whom your reviewer magnifies into the "throng of patients." Any one having a knowledge of asylums will see that the gallery is mere extra space for the infirmary patients, and is intended to serve either as gallery, corridor, or promenade. Take the case of the best asylum in England, namely, that at Whittingham, which was designed a few years since by an experienced medical superintendent. There, the patients occupying two large wards, each for a hundred patients, have, on going to the hall, to pass through a third ward of the same size. If such a system be admissible in an asylum with 1,000 beds, how much more admissible is it in one for 410 beds only, and where, too, there is the alternative of using another corridor. Your reviewer says in his letter that if this other corridor were used the patients "must traverse three sides of a great square of corridors and pass the entrance doors of the asylum." From the door of No. 2 block to the dining-hall is about 200 yards, no great distance for patients in perfect health to walk to their meals; and so far from having to pass the entrance doors of the asylum, they would not be near them, nor even in sight of them. The asylum entrance is, in fact, on a *story higher* than the corridor in question. Moreover, it would only be the patients in No. 2 block who would use the gallery of No. 1 block on their way to the halls, and, indeed, only a small proportion of them. No. 2 block is intended for 35 acute cases, and perhaps 10 of these would be able to use the common dining-hall. The objection, therefore, is reduced to this: that 10 patients might occasionally pass through an empty gallery which happens to be placed in the rear of a day-room, from which it can be separated at will. The patients in No. 3 block being at work in the shops, or laundries, would find the north corridor the nearer route, and would invariably use it, so that the remark cannot possibly apply to any other block than No. 2.

Your reviewer says:—"It is clear that wherever communication is required between one part of the asylum and the other, the cross corridors must be traversed, and the north corridor, the only continuous one, made use of." We reply that in no case is our corridor broken by serving or waiting-rooms, day-rooms, or dormitories. When in the south façade on one side, it is necessary to pass through the dining-hall, or serving-rooms, to reach the other side, and as in asylums the medical officers are alone allowed to pass from one side to the other, we look upon our arrangement, which finds so little favour with your reviewer, as one of the strongest points in our plans, as by it the male and female patients can be kept apart.

We must repeat that in no part of the asylum is there a single blind-window. It is no great feat to construct a staircase in a circular bay and preserve the light, and the detail has been worked out.

As to our not having provided separate day-rooms for epileptics, we reply that such a thing is altogether unknown in small asylums, and if we had provided them, no superintendent would have used them as such, and for the following reasons:—The average proportions of epileptics is about ten per cent. of the total number of the insane, and supposing the Hull asylum to have its full number of inmates, there would be about twenty epileptics on each side. Of these one or two would be private patients, three or four would be in the infirmary by day, five or six would be at work in the shops or in the laundry, and about eight or ten would be cases liable to more or less acute attacks of insanity, and would be placed in the acute ward. Is it for these eight or ten that your reviewer would have provided a separate ward? He ought to have known that it is only at night that epileptics are collected in one dormitory, and placed under special observation. Epileptics need classification as well as other patients, and to place them all in one ward by day would be both cruel and unnecessary.

Your critic adheres to the remark that the staircases are placed at random; but, on the contrary, they are placed with the greatest regularity, and he entirely omits to state that they are used as water-towers, or to give our reasons for separating them from the blocks, as stated on page 2 of our report. We venture to think that no one save your reviewer could have had the idea that the staircases "have a very confused connection with the wards." The system is simplicity itself, and the distance from the wards to the staircases is not further than across the lobby of a private house.

We have also explained at page 3 of our report that it is only a small part of No. 1 block which has a third story providing sleeping accommodation for 26 patients, and for these we have small staircases in the block itself, simply because it saves the expense of a third story on the corridor, and because these staircases could be used for ventilating the first floor of the blocks. Each block has one staircase solely for its own use, and another staircase common to it and the adjoining block. He maintains that "if is impossible for them (the staircase towers) to be used for purposes of ventilation, inasmuch as they are placed at some distance from the wards." This is a new and startling discovery in physics. We had till now been under the impression that a current of air was caused by difference of temperature or level, and as we explained that the hot-water tanks would be placed in these towers and that the towers would rise above the roof, we thought we had sufficiently shown their value as ventilating shafts. In a matter so important as ventilation we have not trusted to them alone, and we have shown an additional way of getting rid of the vitiated air.

As regards the number of beds, the writer of the review withdraws his statement that they are not shown on our plans, and he states that he drew his information from the schedule furnished on p. 5; but he does not tell us why he expected to find beds drawn in the pages of our letter-press. He quotes the "Schedule" as follows:—

No. 1 Blocks,	single	rooms	and	dormitories		164
No. 2	,,	,,	,,	,,	,,	70
No. 3	,,	,,	,,	,,	,,	130
					Total	460

And says that it "does not seem to cast up correctly," and it does not, nor are there such figures to be found in our letter-press at all. *Our* "schedule" is as follows:—

No. 1 blocks	Single rooms, 42	in each block	84
	Dormitories, 58	,,	116
No. 2 blocks	Single rooms, 11	,,	22
	Dormitories, 24	,,	48
No. 3 blocks	Single rooms, 6	,,	12
	Dormitories, 59	,,	118
		Total	400

"In all asylums the female population is in excess of the male, and 10 beds are therefore provided in the housekeeper's department for such patients as are employed in the kitchen, raising the grand total to 410 beds."—We are, &c., (No. 14) "Lucidus Ordo."

SOUTHWELL MINSTER TENDERS.

Sir,—Referring to the list of tenders for the proposed restoration of Southwell Minster Church, given in your issue of this week, I find them far from being correct for the roofs executed in English oak which have been accepted; and as it may be the means of conveying a false impression, the intention of which is obvious, I should feel obliged if you would insert the following list, which I carefully copied, and can vouch for it being correct:—

	£	s.	d.
Jackson and Shaw, London ..	£21,327	0	0
Cornish and Gainer, Norwich ..	19,473	0	0
Dove Brothers, London	19,336	0	0
Estcourt, Gloucester	18,823	0	0
Williams, Cardiff	18,718	0	0
Clipsham, Norwell, near Newark (amended estimate accepted) ..	18,271	0	0
Fast, Melton Mowbray	16,555	0	0

—Yours, &c., J. W. Williams.

St. Matthew's Church, Walsall, Sept. 15, 1879.

Sir,—As one of the competitors for the restoration of roofs, &c., of the above, under "Mr. Christian," I beg to direct your attention to the amount of the several tenders as published in last week's Building News, the whole of which are wrong. The names and amounts of the five lowest tenders being as follows:—

	£	s.	d.
Clipsham (Norwell)	18,171	0	0
Williams (Cardiff)	18,218	0	0
Fast (Melton Mowbray)	18,455	0	0
Thompson (Peterborough)..	18,456	10	0
Estcourt (Gloucester)	18,480	0	0

The above figures were furnished me by Mr. Christian, and therefore must be correct.—I am, &c.,

Jno. J. Fast.

NEWARK HOSPITAL COMPETITION.

Sir,—The remarks of your correspondent, "Nil," anent the above, and his pointed reference to myself as "your correspondent," has induced me to trouble you with this communication. In your issue of September 5th you say, "A correspondent states that the contest will be between Mr. Hind and Mr. Sheppard," but omitted to add those all-important words: "it being practically a foregone conclusion for one or other of them, not as regards merit, but owing to local influence, &c."; hence, Sir, my reason for not competing, although one of the invited twelve.

I could, Sir, astonish your readers by explsining the way in which this competition has been carried out, but will refrain from doing so until the above has been decided, as I am in hopes (although, I confess, it is a somewhat forlorn hope) that, even at the eleventh hour, the committee will pause and reflect, ere too late, and give their decision in accordance with the old motto, "Fiat justitia ruat cœlum," notwithstanding one of the competitors is already boasting "that it's a moral certainty for him," whilst, at the same time, he has admitted to me "that Goddard's, of Lincoln, is by far the best plan and design, in his opinion." To say the least, it is but very questionable taste for that competitor, whilst the plans were on view, to be *constantly* at the town-hall, extolling the merits of *his* design to the onlookers, *and to two medical men of the hospital, in my presence*, and "picking holes" in the others.

As regards merit of designing and architecture, the three best are, in the writer's opinion, Mr. Goddard's, Messrs. Freeman and Naylor, and Mr. Bliss Sanders. You omit to state Messrs. Evans and Jolley are also competitors. I reserve any further particulars or criticism of the designs until the decision; in the mean time subscribe myself— The Correspondent referred to.

Sir,—I am pleased to inform you that the committee have at last somewhat reluctantly consented to carry out my suggestion of July 17th "in obtaining the services of a professional referee, an architect of eminence, to report on the designs sent in," Mr. Mawson, of the firm of Lockwood and Mawson, being the gentleman selected; but must express my astonishment if what I hear is true (and I fear it is) that they do not pledge themselves to be governed by his report, and further that his instructions are "to report on the best plan, irrespective of cost," an important feature of the competition—"or as regards architectural merit in the elevations, &c.," it being a well-known fact that the plans which the committee favour cannot be carried out for anything approaching the sum stipulated.

I sincerely trust that wiser counsels will prevail, and that the committee will reflect on the monstrous injustice such a proceeding would entail on the other competitors who have faithfully adhered to "the instructions" issued, and not stultify or discredit themselves by such a dishonourable proceeding.

On dit the doctors have given their verdict in favour of Mr. Bliss Sanders's plan by seven points, the Committee's favourite being second, and Mr. Goddard, third.

Had there been no grounds for suspicion, I should have responded to the committee's invitation, as, no doubt, the other four architects would have done, but I am heartily glad I did not, considering what is taking place.—I am, &c., R. W. G. Hayward.

6, Bar Gate, Newark-on-Trent, Sept. 17th.

DANGEROUS STRUCTURE, 29, HAYMARKET.

Sir,—I think it right to state that in this matter Mr. Thos. Verity, who is acting for the building owners, is most anxious to comply with the law. Mr. Chas. Sewell, of 22, Buckingham-street, is acting for the adjoining owner.

Finding the premises dangerous, I wrote both gentlemen and suggested that they should call in a third surveyor and have an award, and take down the dangerous portions of structures, and I held the matter over for three weeks. They agreed upon an umpire, an eminent surveyor, who made an award which said nothing whatever about the most vital point, shoring up the adjoining house; whereupon Mr. Sewell wrote me on behalf of his client, formally requesting "that I would see that the building owners' contractors executed all proper and requisite shoring which I might consider necessary to secure and uphold his client's premises during the progress of the works."

Of course, all I could do was to report them dangerous, and let the board's contractor shore up, and hence the dangerous-structure proceedings.

Were it not for the fact that there are grave questions involved as regards the safety of human life while different owners squabble, as well as property in these cases, the idea of making a district surveyor responsible for compelling someone else to shore up a third party's house would be a good joke.—I am, &c.,

Robert Walker.

21, King William-street, W.C., Sept. 18.

IRISH CROSSES IN NORWAY.

Sir,—In looking over your number for the 5th proximo, I was much struck in observing what is unmistakably an Irish Cross in your illustration of the old wooden church at Hitterdal, in Norway. It marks the site of a grave opposite one of the entrances to the building. If it is merely the fruit of imagination, as I presume the three human figures are, to embellish the illustration, of course all interest would end there; but if, as may be the case, it really exists, to my mind such a fact would furnish matter for a new chapter in archæological investigations. That Irish crosses should be found to exist in Norway at first sight seems strange enough, yet it does not belong to the catalogue of impossibilities. The Norwegians, like the Danes, were ancient enemies of Ireland. Every student of Irish history remembers the date 837, the year that the famous Turgesius arrived in Ireland with his fleet of 120 sail. It is no wild theory to suppose those Scandinavian heroes or their successors may possibly have carried back with them on their return home some idea of the peculiar Irish cross. It is beyond doubt that they abounded in Ireland, even at that remote period, though my own opinion is that most of them were of Christian origin. Mr. Keane, in his "Towers and Temples of Ancient Ireland," p. 177, ascribes to them a greater antiquity still. He writes: "They must be ascribed to ages of remote antiquity—even to the Cuthrite inhabitants of Ireland, who preceded the Celts." Moreover, your illustration, as you remark, "represents the church not *as it is*, but *as it used to be* before the ruthless hand of the restorer robbed it of half its picturesqueness." A portion of Runic carving in the edifice fixes its date, as you also inform us, to be the 11th or 12th century. All this would corroborate my suggestion. Scotland, too, another northern country, preserved, doubtless, many Irish crosses. In fact I am persuaded that most of the "360 crosses which originally adorned the Island of Iona" (inhabited by Irish monks), as the late gifted H. H. Vale, F.R.I.B.A., states in his paper on the "Antiquities of Iona," read before the Liverpool Architectural and Archæological Society in 1868, were Irish crosses. Whether, however, they found their way to Norway, as I am led to believe, remains a problem, the solution of which would no doubt be highly interesting to architectural antiquaries.—Yours, &c., J. B. S.

Liverpool, Sept. 12.

THE CATHEDRAL, CORDOVA.

Sir,—I have just seen Mr. Steward's letter on the above in your last number. I believe that over the present roof there is sufficient evidence to show that the original ceilings to the main aisles were curved—long waggon roofs, in fact, and highly decorated. The flat roofs were against outer walls. The date given by your correspondent to the stalls is quite wrong; he has merely quoted a misprint in O'Shea's guide book (a work full of misprints and careless errors). The choir in which the stalls stand was erected in the earlier part of the 16th century. The stalls are of mahogany, marvellously elaborate, and overloaded with detail. They were erected, as their style clearly shows, about the middle of the last century. I take it that for 1257 should be read 1725.—I am, &c.,

Somers Clarke, Jun.

6, Delahay-st., Gt. George-st., S.W.,
Sept. 17th.

Messrs. Macdonald, Field, and Co. are now finishing, at their sculpture works, in the Euston-road, London, a polished granite memorial-stone, designed to perpetuate the memory of Lieut. Scott Douglas, who gallantly met a soldier's death in Zululand while discharging an important duty. The stone, which will shortly be shipped for South Africa, to be placed near the spot where the faithful young soldier fell, is surmounted by a flat cross, and on the top and round the sides bears an inscription.

The prizes awarded by the Science and Art Department to the students in Mr. H. C. Tarn's science classes, at Devonport, were distributed on Monday evening.

Intercommunication.

QUESTIONS.

[5891.]—**Cementing Church Windows.**—Can any experienced glazier of leaded windows for ecclesiastic and domestic buildings inform me of a really good "cement" which shall be (1) proof against "raining in," (2) harden with age, (3) be easily applied, (4) "set" very quickly—say, in a couple of days, (5) leave the glass clean in "rubbing off," (6) not be liable to "run" while being fixed, and (7) be clean and economical to use?—Inexperience.

[5892.]—**Coating for Plaster.**—Could some reader kindly inform me if a coating of Portland cement and boiled oil would be good to put on over "compo-lime plaster," which has not hardened well because of sufficient lime not having been used, and the sand being very fine sea-sand washed? If any other treatment to give a good surface would be better I should be glad to hear of it.—G. P. B.

[5893.]—**Zinc Roof Laying.**—Will some one recommend me a good treatise of zinc roof laying? Should have diagrams of suggestions for treatment under varied circumstances.—W. A. G.

[5894.]—**Surveyors' Charges.**—I have beem employed to lay out a plan of 25 acres of ground in the suburbs of a large city in Scotland in the form of streets and terraces, and divided into building lots. I have also drawn an alternative plan, both of which have been lithographed and circulated. It is ultimately intended that I shall receive a small fee from each party acquiring lots for my trouble in staking off the ground and supplying them each with a plan of same, but this is only in prospective. In the mean time, as the company of proprietors are about to dissolve partnership, it is necessary that I send in my account for payment. I wish to charge very moderately. Will any one kindly favour me with some clue or datum by which I may make up a plump sum, and much oblige—C. E.

[5895.]—**Sewer Gas.**—How can presence of sewer gas be tested in w.-c.'s or elsewhere?—C. S.

[5896.]—**Concrete.**—What quantities of material would be required to make one yard of concrete, proportion—say, 6 of gravel to 1 of cement?—C. S.

[5897.]—**The Severn Bridge.**—A few days ago I had the opportunity of visiting this great piece of engineering work. A detailed description of the mode of construction would, I am sure, be gladly received by many of the younger members of the profession. I hope this may cause some one who has been engaged upon the works to give your readers a detailed account of this work.—Gloucester.

[5898.]—**Panelled Plaster Ceilings.**—Will some reader of this journal kindly tell me where I can see (in London) one or two good examples of panelled plaster ceilings? My client, who thinks of using this mode of decoration, is anxious to judge of the effect from executed examples.—W. N. A.

REPLIES.

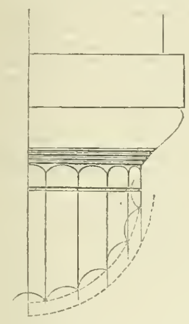
[5881.]—**Animal Carvings on House at Cordes.**—A hint to Mr. E. T. Scott and others whom it may concern: In quoting title of book, if possible give Christian name or initials of author. This may appear a point too small for notice, but to those who consult the indexes of the British Museum catalogue it means an important saving of time. Indeed, unless the author's name be given, it is as difficult to find a volume not in the "General Reference Library" as to find the proverbial needle in haystack. In the instance this "Anderson" who illustrates la Maison du Grand Veneur, Cordes, is "R." In his "Examples of Municipal, Commercial, and Street Architecture of France and Italy," a large folio published in 1870-75, three plates are given of the house of which "Pierre Crayon" seems to fancy he has been the original discoverer—one, plate 15, general elevation of façade, resembling that reproduced from Thos. Hudson Turner's "Domestic Architecture in England" in the Building News last week, but differing in several minute particulars, and evidently an independent drawing. Plate 16 shows measured drawings, one of the beautiful two-light windows in the street front, in elevation, plan, and section, on scale of inch to foot, and plate 17 gives details, to ¼ full size, of one of upper windows. I will condense part of the accompanying letterpress:—"The design of the façade, as also of all the principal houses in Cordes, consists of a series of arches on the ground floor, one of which forms the entrance to the house, the others to large apartments which must have been used either as shops, because they are frequently cut off from all communication from the rest of the house, or as stores in connection with it. The small windows above arches [see woodcut last week] must have been in connection with some sort of entresol which does not now exist. The first and upper floors are all well marked out by moulded string-courses, and the windows are either spaced singly or in groups of two or three." The author adds that although Cordes contains an unusually large number of its original houses with the mason work in a state of good preservation, so many internal alterations have been made that he is unable to give any illustrations to the woodwork, and that even the roofs of nearly all the houses have been altered or renewed.—E. W.

[5887.]—**Warehouse.**—In reply to "Ignorance," as we must assume that the floor may be uniformly loaded with its light load, the iron tongues must not be counted on for additional strength. The square of 1 is 1, the square of 3 is 9, therefore a floor 3in. thick will support 9 times what an inch floor would. Let 1¼cwt. (about) as safe load uniformly distributed be required, then beginning with a foot long let us consider 1cwt. as the safe load on centre of a piece 12in. between bearings and inch square, then 3in. deep and inch wide will be 9cwt. = S. L., and 12in. wide = 108cwt. as safe load, and 108 ÷ 13 will give 8·3cwt. as S. L. on centre, or 16·6cwt. as S. L. equally distributed, and 16·6 ÷ 13 = 1·28cwt. = 1cwt. 1qr. 3lb. This as usual includes the weight of the floor, but will leave about 121lb. real carrying power for safe load per foot superficial. Now, 7 × 2½ battens may not be so strong wood as the deals, but assuming it would, and that the joists be 12in. centre to centre = 9½in. apart, then $1^2 = 1$ and $7^2 = 49$, and 49 × 2½ = 122·5cwt. = S. L. on 12in. bearing, and 122·5 ÷ 13 = 9·42cwt. as S. L. on centre, or equal to 18·84cwt. = S. L. distributed equally. Now, 16·6cwt. was the strength we wanted to equal, and therefore as 16·6 : 18·84 = 12 : 1·36, and 1·36ft. = 1ft. 4⅓in.—say, 1ft. 4½in.—from centre to centre for the same strength, but we only require 1ft. 2½in. if 12in. apart, and the difference will perhaps about equal the difference in strength between the deals and battens, and if so then the area in section per foot in width will be battens = 7 × 2½ + 12¼ × 1 = 17½ + 15 = 22½in., and deals will be = 12 × 3 = 36in. and difference per square = 7½ × 100 = 750, and ÷ 144 = 5ft. 2in. cube saved—say, 15s. saved—but the extra expense in labour and nails will reduce this materially, and the 5in.—say, 6in.—of brickwork will just about absorb the remaining balance in favour of battens. With the 3in. floors the planks should be supported against flues by plates on strong iron or York stone corbels, built 4½in. into the wall, one end and side, or if iron, then build in at least 9in. into the solid part of the stack. Where there is a set off the plates can be carried on same, and the stacks should be designed with sets off for the purpose if possible. Where timber bears against flues the brickwork should be pargeted at the back of the timber.—Henry Ambrose.

[5888.]—**Minutes.**—A minute is the 60th part of the diameter of a Classic column.—W. Boyden.

[5888.]—**Minutes.**—The "minutes" are measuring units applied as a scale of equal parts by which the orders are proportioned. The diameter or semi-diameter of a column at the bottom of shaft has been selected by many architects as their "module." This module they divide into "minutes." "Vitruvius" divides the semi-diameter into 30 parts or minutes, and the figures shown in diagram represent these. Those on the right of capital show the projection from centre axis of column, and those to the left between the horizontal lines the heights expressed in "minutes." These units are used in short for the measurement of the smaller members of an order.—G. H. G.

[5888.]—**Minutes.**—In reply to "Star," minutes are in number 30 to one module, which is equal to half a diameter, and the minutes will in our case, where horizontally measured, be from the axial line, and vertically will be set up as per sketch. I presume the sketch is nearly like the Doric capitals of the temple of Minerva, at Athens. It has, I believe, been ascertained as probable that the Greeks generally governed their designs by making the width of the abacus an aliquot part of the height of the column, and in Doric generally one-fifth, and then divided the width of the abacus into any number of aliquot parts the taste of the architect might direct, whence it follows that minutes, unless subdivided, might not always fit, as we know they do not.—Henry Ambrose.



STAINED GLASS.

Walsham-le-Willows, Suffolk.—The three-light west window of St. Mary's parish church, Walsham-le-Willows, was unveiled on Sunday after being filled with stained glass as a memorial. The design represents three scenes in the parable of the Good Samaritan—the falling among thieves, the compassionate attention of the Good Samaritan, and the committal of the wounded man to the charge of the host at the inn. Over the subjects are canopies, and in the tracery above are the figures of Joseph, Mary, and other saints. The design was executed by Messrs. Lavers, Barraud and Westlake, of London, and the window was inserted by Mr. Drake and Mr. Kerrison, of Walsham.

WATER SUPPLY AND SANITARY MATTERS.

Bournemouth.—At the meeting of the improvement commissioners on Tuesday the drainage difficulty was further discussed, and it was decided that the superintending engineer should prepare plans and specifications of the work required to be done to remedy the alleged defects in the new sewers; that the commissioners do the work themselves if the contractors refuse; and that the cost should be deducted from the amount still due to the contractor.

STATUES, MEMORIALS, &c.

Devizes.—The memorial to the late Right Hon. T. H. S. Sotheron-Estcourt, erected in the spacious marketplace of Devizes, was unveiled on Tuesday. The central feature is a full-length statue, by Mr. Nicholls, of London, and around the base is a fountain. The memorial has been erected from the designs of Mr. Woodyear, of Graffham, Guildford. Messrs. Wheeler, of Reading, were the contractors.

LEGAL INTELLIGENCE.

Bad Mortar.—George Freeman, builder, of Tottenham, was summoned to Edmonton Petty Sessions on Tuesday, charged with offending against a by-law of the Tottenham Local Board, with respect to the structure of walls of new buildings for securing stability and the prevention of fires, in certain new buildings in Lordship-lane, in that they were not solidly bonded together with mortar and cement. Mr. De Pape, surveyor to the Tottenham Local Board, proved the case, producing samples of mortar taken from the walls. The materials consisted of screened earth, taken from the top spit of the mould on the site, ashes, and a small quantity of lime. It would not bind. Defendant's foreman, Clarke, said the mortar consisted of 2 parts of sand, 1 of lime, and 1 of loam. That was the proportion they were using, and he had seen worse used in the metropolitan districts. In reply to a magistrate, he admitted that good mortar would not crumble like that produced. Defendant was fined £5 and costs.

CHIPS.

The memorial stone of the new Wesleyan chapel at Boscombe was laid on Tuesday week. The building will be after the Early English style. Mr. Curwen, of Liverpool, is the architect, and Mr. Collins, of Winton, the builder.

Maidford parish church was reopened last week after restoration at a cost of £400. Mr. Heath, of Eaton-square, London, was the contractor.

The Baptist chapel at Burton Latimer was reopened on Tuesday week after renovation at a total outlay of £756 4s. 7d. The architect was Mr. R. Johnson, of Kettering.

The new municipal offices in Salford are completed. All the rooms are fitted with Boyle's patent ventilators.

The Corporation of Galashiels have appointed Mr. G. A. Lundie, M.I.C.E., of Cardiff and Westminster, to make the survey of the borough.

The foundation-stone of the Shropshire Eye, Ear, and Throat Hospital at Murivance, Shrewsbury, was laid on the 9th inst. by Earl Powis. The design was selected in competition, and is by Mr. C. O. Ellison, of London and Liverpool. The ground-floor is occupied by the out-patients' department, and by day and dining-rooms for both sexes, matron's room, and secretary's room. A staircase from the central hall leads to two wards of four beds each in each wing, connected by corridors; and above are two special wards of two beds each, operating-room, and kitchen and servants' rooms. Messrs. Treasure and Sons, of Shrewsbury, are the contractors, and the cost will be £6,400.

The Wesleyan Chapel, Maryport, Cumberland, was reopened on Sunday week, after alterations carried out by Messrs. M'Kenzie and Wilson, of Maryport.

The restoration of Halifax parish church is being rapidly pushed forward, in readiness for the reopening services to take place next month. Nearly the whole of the pews are in position, and the erection of the screenwork is being proceeded with. The floors having been concreted, the tombstones have been replaced, and marble is being laid in the chancel. Mr. G. O. Scott is the architect.

At a meeting of the drainage trustees of Washingborough and Heighington, Lincolnshire, held on Tuesday week, it was resolved to call in Mr. Williams, of Boston, to prepare specifications and procure estimates for raising and altering the banks of the South Delph and Branston Delph.

The local authorities of Colwyn, on the north coast of Wales, have appointed Mr. T. B. Farringdon, the surveyor for the Pwllycrochon Estate Company, as engineer for the proposed water supply scheme.

At the last meeting of the Ennistymon (county Clare) board of guardians it was decided to reduce the salary of sanitary officers by one-fourth, and forwarded to the Local Government Board a resolution declaring the appointment of such officers were mere sinecures.

The Brighton Town Council have received tenders from eleven firms for the supply of paving bricks. They have accepted that of Messrs. John and R. Norman to supply 30,000, at £3 12s. 6d. per 1,000; and that of Mr. James White for 50,000, at £3 7s. 6d. per 1,000.

Our Office Table.

The Scarborough Town Council received on Monday week a report from the Sanitary Committee recommending that a register be kept showing the following particulars with reference to every dwelling-house erected, and to be erected, in the borough:—Number; date of inspection; situation of premises; owner; occupier; rooms, (*a*) living rooms, (*b*) bedrooms; inmates, (*a*) family, (*b*) lodgers; privy or w.c.; ashpit; nature of water supply; drainage, ventilation, and general condition of premises; existence of any special source of actual or possible nuisance; remarks of medical officer; additional observations. The report was, as might be expected from the elected representatives of ratepaying lodging-house keepers, strongly opposed, on the grounds of the expense, and the impossibility of finding a competent official to issue such certificates; while others regarded certificates as quackery, suggesting distrust to visitors; and some deemed the plan altogether needless. On a division, 12 voted for the adoption of the report and 12 against, whereupon the Mayor, Mr. W. C. Land, exercised his right to give the casting vote in favour of the suggested issue of certificates, which, at least, will commend itself to intending visitors to the Northern Queen of Watering Places if not to the letters of lodgings.

The American Social Science Association held its annual session at Saratoga last week. Among the topics treated which were of a sanitary nature were a report by Prof. William Watson, of Boston, "On the Protection of Life from Casualties in the Use of Machinery"; an address by Col. Waring, of Newport, on "The Sewerage of Village Cities," to be debated, and which continues in a paper by E. C. Metcalfe, of Brunswick, Me., on "The Influence of Sewers on the Public Health." Dr. Charles P. Russell, of New York, presented a paper on "The Sanitary Condition of Tenement Houses"; and Dr. Charles A. White, of New York, discussed the "Causation of Yellow Fever."

The picture gallery and museum which have been added to the Wedgwood Institute, Burslem, were formally opened last week. The gallery is appropriately inaugurated by the exhibition of a collection of the works of G. H. Mason, A.R.A., and James Holland, both of whom may be considered local artists, Holland having been born in Burslem, and Mason at Wetley Abbey, a few miles distant. The pictures of these artists, over 100 in number, now on view at Burslem, have been lent by a number of owners all over the country, and Mr. Woodall, we understand, has been the main instrument in bringing them together. Some idea of their value may be gathered from the fact that the collection has been insured for £30,000. In addition to the Mason and Holland paintings, there are a few works by other artists, and a collection of pottery, and in separate rooms several cases of objects from South Kensington. The exhibition will be open for three months.

The National School of Art Wood-carving was established with a view of encouraging, or rather reviving the greatly neglected art of wood-carving in this country by a committee consisting of the following gentlemen:—Lieut.-Colonel Donnelly, R.E., Mr. E. J. Poynter, R.A., Mr. R. W. Edis, F.S.A., the late Mr. P. Le Neve Foster, and Mr. J. H. Donaldson, of the firm of Messrs. Gillow and Co. The committee has since been joined by Mr. H. T. Wood, secretary to the Society of Arts, and Mr. W. Chapman, and Mr. W. P. Sawyer, of the Drapers' Company. The committee, who were greatly aided by the Society of Arts and the Drapers' Company, engaged an eminent Florentine wood carver, Signor Bulleti, and opened a school last year at 3, Somerset-street, Oxford-street, with the assistance of Mr. Donaldson. The Royal Commissioners for the Exhibition of 1851 have now placed an excellent room in the Royal Albert Hall at the disposal of the school, and the Drapers' Company have given a further grant, with which the committee are enabled to provide for the instruction of 12 free students. Candidates for free studentships are selected from persons of the industrial class who are intending to earn their living by wood-carving; other students are admitted to the day classes of the school on payment of £2 a month or £5 a quarter, and to the evening classes on payment of 15s. a month or £2 a quarter. For particulars, applications should be addressed to Mr. Healey, National School of Art Wood-carving, Royal Albert Hall, Kensington, S.W.

The Philadelphia papers contain descriptions of a new and successful invention in use in that city for laying street pavements. According to the statements of our contemporaries it pounds granite blocks and cobble stones into place, making the surface, one paper says, as smooth as a billiard table, and promises to do away with the old style of paving the streets. The rammer, which looks like a locomotive at a distance, is operated on the same principle as a trip hammer, and can be so regulated as to make a stroke of one pound weight or 1,500lb. This enables the operator to produce a level surface on every portion of the street it passes over, while the most expert man power cannot strike over two hundred pounds. Durability and solidity are the important features of paved streets, and while hand power can only force the stone into the earth three inches, the steam rammer sends them six inches with ease; thus making the stones compact and solid. It is claimed that the streets paved with this new invention will last until the stone is worn out. The machine weighs six and a half tons, and even that makes no rut or impression on the street which it has rammed. In repaving streets paved with cobble stones under the old system it is necessary to relay them, while, with the steam rammer, they can be driven to a level with perfect ease. It requires the services only of an engineer and a man to guide the rammer to work the machine. It consumes one-fourth of a ton of coal per day. A number of streets in West Philadelphia bear splendid specimens of its work.

Some interesting figures respecting the life of rolling stock and superstructure in the United States have been compiled by the Illinois Railroad Commissioners, from the returns of 26 roads reporting on the subject. They show the following general average of duration:—Locomotives, $15\frac{1}{4}$ years; passenger cars, $15\frac{3}{4}$ years; stock cars, 10 years; freight cars, $11\frac{1}{2}$ years; iron rails, 7 years; steel rails, 14 years; oak ties, 7 years; pine ties, $4\frac{3}{4}$ years; cedar ties, $5\frac{1}{2}$ years: truss bridges, $9\frac{1}{2}$ years; trestle bridges, 8 years; pile bridges, 9 years; joints and fastenings, 7 years; and fencing, $8\frac{1}{2}$ years. The Toledo, Peria, and Warsaw-road gives the life of locomotives at 8 years, and of passenger cars at 15; while the Michigan Central gives locomotives 24 and the passenger cars 20 years of life. Only one other road puts the life of passenger cars at 20 years. The lowest reported life-rate of passenger cars is 8 years. The shortest life of iron rails is 3 years; the longest 12 years. Four roads give 10 years. Only four roads report the life of steel rails, and they give it as 9, 12, 15, and 20 years respectively.

The twelfth session of the Trades Union Congress is being held this week at Edinburgh. Over a hundred delegates, representing a constituency of half a million workmen, have been present. The chairman for the year is Mr. J. D. Prior, of Manchester, of the Amalgamated Society of Carpenters and Joiners, who delivered an address on Monday, in which he cast a retrospective glance over the history of labour movements, and urged the present congress to ascertain whether something more cannot be done to alleviate the suffering and privation which prevail amongst those represented. Mr. David Gibson, chairman of the Edinburgh Trades Council, was elected president for the session, and gave the inaugural address on Tuesday, in which he maintained that the working men had been justified in the action taken in the numerous trade disputes of the past year, wherein, however, he was sorry to admit, they had been for the most part unsuccessful.

The old wooden railway structure over the valley at Denby Dale, Huddersfield, is being replaced by one of stone, which, it is hoped, will remove any anxiety which passengers might be inclined to feel had the new viaduct not been constructed. The first stone of this large work was laid on September 20th, 1877, and to-morrow, just two years after, the key-stone of the last arch will be fixed. This is one of the most substantial works on the railway; its length is 1,100ft., and greatest depth 126ft., and it consists of twenty-one arches of 40ft. span, supported by sixteen piers and six abutments; the piers are 11ft. wide at the bottom, and 6ft. 6in. at the top, all solid masonry; the abutments at the north end are three in number, the widths of which are 29ft., 26ft., and 23ft. respectively. The skew bridge at the south end, crossing the Barnsley road, is supported by two abutments, 45ft. 6in. being the width of each; the bridge has an opening of 40ft. on the square and 55ft. on the skew face; the abutment against the bank at this end is 40ft., all solid stonework; the depth of the bank at each end is 80ft., supported by a retaining wall 300ft. long, 15ft. wide at the base, and 13ft. at the top. The arch quoins are 3ft. and 2ft. alternately on the soffit, the depth being 3ft.; the arches are 2ft. 6in. thick, turned with parpoint masonry. The stringcourse is 12in. thick, and 2ft. wide; the copings of the parapet are one foot thick and 18in. wide. The contractors are Messrs. Naylor Brothers.

During the Church Congress, which takes place at Swansea early next month, an exhibition of ecclesiastical art will be held on a somewhat extended scale. Several of the leading art firms have promised contributions of ecclesiastical silversmiths' and goldsmiths' work, including chalices, patens, flagons, alms-dishes, &c. Specimens of ornamental brasswork, wood-carving, encaustic tiles, &c., will also be shown, while stained-glass will be represented by a number of examples with which the windows of the hall in which the exhibition is to be held will be temporarily glazed. Church needlework and embroidery will form an important feature, and there will be shown a collection of ancient vestments from Bruges of great archæological interest. The exhibition will also include a collection of photographs of pictures by the Old Masters and photographs of celebrated cathedrals and churches, besides engravings of objects of ecclesiastical art.

As to insurance tending to encourage the erection of cheap and unsubstantial buildings, remarks the (American) *Fireman's Journal*, the fact is so apparent that it needs no argument. Buildings, especially those designed for business purposes, are erected in the hope that they will prove a source of profit to the owner. A cheap and flimsy block, having a showy exterior and tawdry finish inside, will rent for quite as much as a building more substantially constructed and costing more money. If the owner had to take his own risk as to fire, he would make his building as nearly fireproof as possible; but as the insurance companies, for a small premium, will insure the building for all, or even more, than it is worth, the owner naturally puts up the building that will be the most profitable and cost the least money. Hence we have those architectural abominations and fire-spreading agencies, mansard roofs, and modern structures wherein wood takes the place of brick or stone wherever possible. Insurance tends also to make property owners careless, and even reckless, as to their property, subjecting it to risks and hazardous exposures that they would not tolerate for a moment if they had to foot the bills in case of loss. In view of the facts in the matter, which are apparent to whoever looks for them, we repeat what we said before:—It may well be questioned, then, as it is now being done, whether fire insurance, as at present practised, is a blessing or a curse to the country. Properly managed, insurance is a great benefit, but of late the competition for business has been so great among the companies that it has certainly impaired, if it has not destroyed, their usefulness.

The scaffolding has now been removed from Mr. Waterhouse's new Natural History Museum at South Kensington, so that it is now possible to judge of the effect of the great entrance and flanking towers, of the octagonal spires to these and the angle masses, of the long façade of terra-cotta next Cromwell-road, with its clever ornamentation of divers beasts, birds, and fishes, used as terminals and gurgoyles and in plaques and bands of ornament. The great gates are in position, the principal lodge is being built, and, simultaneously with laying pavements and finishing boundary walls and railings, the grounds are being laid out. It is stated that the museum will be occupied early in the new year. We illustrated the museum by a general perspective and principal plan on February 14th last, and in the previous volume published a series of working drawings exemplifying the terra-cotta construction and animal ornamentation (in Building News, October 11 and 25; November 8, 22, and 29; and December 13 and 20, 1878).

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 26, 1879.

THE ALLEGED DANGEROUS STRUCTURES IN THE HAYMARKET.

A CASE presenting a noteworthy instance of the very unsatisfactory working of the Dangerous Structures clauses of the Metropolitan Building Act has recently been brought before Mr. Mansfield at the Marlborough-street Police-court, the leading facts of which have already appeared in the Building News. As it affects the rights and liabilities of both the owner of the building and "adjoining owners," no less than the district surveyor, the question the magistrate has to decide is particularly important. In a letter addressed by Mr. Robert Walker, the district surveyor of St. Martin-in-the-Fields, to Mr. Vulliamy, the superintending architect of the Board, and which was published in our issue of the 12th, Mr. Walker refers to the magistrate's decision as one that will place district surveyors in a very awkward dilemma of deciding whether temporary shoring is really compliance with the law. We content ourselves here with a very brief outline of the facts. No. 28, Haymarket, has been lately pulled down for the purpose of being rebuilt for Civil Service Stores; and No. 1, Arundel-place, which adjoins in the rear, and which also abuts on the back of 29, Haymarket, has been condemned by Mr. Mansfield. An order was made for the removal of its inmates, and for a considerable part of the building to be taken down, together with the wall belonging to No. 28. During the execution of this order an arched chamber was discovered on the ground-floor of No. 1, Arundel-place, but which belonged to Mr. Fagg, the owner of 29, Haymarket, which was found to be so ruinous that Mr. Walker reported upon its danger. It was alleged that Messrs. Kirk and Randall, the contractors for the Civil Service Stores of No. 28, could not proceed with the order for demolition of the portions of structure above and below it without incurring danger. It appears that Mr. Walker thereupon advised Mr. Fagg, the owner, to shore up this ruinous chamber, and, in accordance with the surveyor's suggestions, two needles and shores were erected to support the arch. A summons was issued against the owner, and the case came before Mr. Mansfield on the 3rd inst., when witnesses were called on behalf of Mr. Fagg to prove that the structure being shored up, it was now safe, and although Mr. Walker adduced evidence to the contrary and declared that the said structure was in imminent danger, the magistrate ruled that it was safe, and the summons was dismissed. Such is a bare recital of the facts as they are published. The case has since been reopened by the Metropolitan Board of Works, and a full report will be found in our issue of to-day. Pending the magistrate's decision, which will be given after the whole evidence has been brought forward, it would be premature on our part to express any opinion upon the legal bearings of the case, and we therefore desire simply to confine our present remarks to the bare facts as we have gathered them from a personal examination of the structure, and from the evidence now before us. Whether simply shoring a building can make it "legally safe" is a question we will not now dwell upon, and we can well leave that issue to the decision of the learned magistrate himself. The witnesses called last Friday on behalf of the Metropolitan Board of Works and their surveyor were unanimous in their opinion of the defective and dangerous condition of the party-wall between Nos. 28 and 29, and of the arched structure that has been shored up. As regards the party-wall, it was alleged by Mr. Walker that it was defective in construction, and loose in composition; the bricks were generally place bricks, and were not built up with mortar; but the most noteworthy feature about this wall was, that, according to Mr. Walker, who produced sections of the defective structures, it had neither footings nor concrete, was built on a sandy soil, was much cracked, and was bulged out near the top. Mr. Forster Hayward, in his evidence, which was clearly given, corroborated generally this condition of the party-wall. He said it was defective in parts; the upper part of wall was loose and was bulged in places. Mr. Woodthorpe, architect and surveyor, confirmed the statement that the wall was built on sand, the upper part was ruinous, and the end cracked. With respect to the party-wall between 28 and 29, we have seen many worse walls, both in materials and workmanship, that have been allowed to stand, though the defects pointed out in its construction, by Mr. Walker, certainly render it faulty under the provisions of the schedule of the Act. The chief difficulty, no doubt, is in the removal of the horizontal struts which now help to support it and the wall on the other side condemned by the Court. It will be necessary also to remove an old beam that now abuts against the bulged portion of the wall in question, and some care will have to be exercised in these operations. The new Civil Service Co-operative Society, about to fill up the intervening space, are bound to provide stable and efficient walls on either side, as well as to protect themselves from risk. It is the interest of the adjoining owner, on the other hand, to maintain the existing structures, and hence has arisen a difficulty which, at least, taxes the temper and equanimity of those engaged in the settlement of the question. The arched structure, of course, was made the principal object of inquiry, and it is to it we wish more particularly to direct attention. Mr. Walker's opinion of its dangerous condition was supported by Mr. Hayward, Mr. Woodthorpe, Mr. Verity, and other witnesses called. One of the principal points was, whether, if the angle fire-place which now forms a mass of brickwork, or kind of buttress to the arch, was removed the vaulted chamber would fall. Mr. Hayward, Mr. Woodthorpe, and Mr. Verity all agreed that it would. It would be impossible without a drawing to explain to the reader the exact position of this arched structure, which forms the *crux criticorum* of the proceedings, and which, though structurally belonging to No. 1, Arundel-place, really is in the occupation of the owner of 29, Haymarket. We may just mention that the chamber or vault is about 8ft. by 9ft., that it is arched over by a semicircular half-brick ring, one side of which abuts against a defective side wall which forms a portion of the party-wall between the two properties. A mass of rough brickwork, the base of a chimney stack which has partly been demolished under the magistrate's order, still remains on the ground of the building owner, and it is alleged that if this is attempted to be removed the arched chamber which is partly above it must fall and endanger the lives of the men. The upper and lower portions of the structure have both been condemned and partly pulled down, the intermediate chamber itself has been shored up, and the magistrate decided the other day, as we have said, that it was safe because it has been secured. Evidence is generally of so conflicting a nature in cases of this kind that we determined to view the structure ourselves. We found that the chamber was strutted both on the flank or springing of arch and at the angle; two uprights and needles were also introduced to carry the arch. The side wall from which the arch springs we found to be very rotten, the bond broken in parts and defective, a vertical crack appears also at the angle between the side wall and outer wall of chamber. We examined to see if the side wall of chamber next the Civil Service Store premises, No. 28, was carried down to the depth of the other footings, and we found by an examination with an iron bar that the walls do not go down. The remains of angle fireplace, which forms a kind of spur or buttress against the structure, is very loosely built, but that it affords a lateral support to the structure we have no doubt whatever. We further believe, that to remove this mass of brickwork would be to imperil the arched structure, which undoubtedly rests to a considerable extent upon it. On the other hand, if the walls had gone down independently, the taking away of the brickwork would have had merely a weakening effect. The effect of the shoring is unquestionably to uphold the arched portion of the chamber; the needles and struts would, no doubt, be sufficient to carry the upper portion temporarily, but the lower portion must certainly yield if the buttress be taken away. We have no hesitation in saying the contractors of No. 28 are in an awkward dilemma. If they attempt to proceed with their work, by cutting away the old chimney-breast, a portion at least of Mr. Fagg's chamber must fall, and it would be hardly safe to proceed without further shoring. Our opinion of the dangerous state of this chamber has not been materially weakened by the evidence adduced last Saturday, the principal witness being Mr. Sewell, who stoutly maintained the security of the structure. That gentleman threw some light upon the arched chamber, which the other witnesses in support of the summonses failed to do. The section produced by Mr. Sewell—if we can rely upon it as being drawn to a proper scale—showed a very different proportioned chamber to that exhibited by Mr. Walker; the height from floor to arch was at least 3ft. less than Mr. Walker's section indicated, while the outer brickwork seemed to be more in accordance with the present condition of the remains. These data appear certainly more favourable to the stability of the arch. Another fact, though not very material, was that the lower portion of the wall supporting the arch was 9in. thick, instead of 4½in., as stated, though the upper portion beneath the arch was of the latter thickness. It must be remembered the strength of a structure is that of its weakest part. Mr. Sewell hesitated to say whether the arch would stand without the brickwork. Mr. Grain, in his cross-examination, elicited a remark, however, that if a certain thickness of party-wall at this part was left no danger would ensue, and we rather think a strong point in the defence turns upon the mutual support of the party-wall, or what proportion of it belongs rightfully to Mr. Fagg. Another point of some importance was the actual position of the chimney-stack that has been partly removed. It was sought to be shown by Mr. Green, the counsel for Mr. Fagg, that the chimney rested upon the arch, and because it had been taken down so much less weight rested upon the arch. Now, the fact seems to be that the chimney did not rest upon the arch, but really acted as a buttress, its upper portion loading the haunches, and, therefore, steadying the arch. We do not go so far as to think that if the arched chamber fell it would endanger the rest of the structure in Arundel-place, and to this extent we agree with Mr. Sewell. It is not our object here to enter into the legal questions involved in this rather complicated case. Clauses 69 to 73 of the Dangerous Structures Act appear clear enough, and require a survey to be made of any dangerous structure, and it is the business of the surveyor to say whether the structure is or is not in a dangerous state. Much hangs upon the word "dangerous," and after all, it is a question of degree, and can only be certified to by a careful and unbiassed examination of the building. By clause 72 the Board is empowered to cause to be shored up, or otherwise secured, such dangerous structure, and "to give notice in writing to the owner of such structure, requiring him forthwith to take down, secure, or repair the same, as the case requires." The next clause also empowers the magistrate, in case of non-compliance, to order the structure to be taken down, or "otherwise secured to the satisfaction of the surveyor." It will thus be observed that considerable discretion is left to the district surveyor, who can, and ought, to use his own judgment whether such a structure can be safely secured otherwise than by taking down. We have considered the actual condition of danger of the structure rather than whether the law has been fairly complied with. After all, the practical issue to be decided is whether Mr. Fagg's arched chamber is really dangerous, or can be temporarily secured by shores, or otherwise rendered safe during the rebuild-of the adjoining premises? We do not express an opinion as regards the latter, nor can we enter into other questions that have been raised, namely, whether sufficient care has been exercised in the pulling-down of the adjoining building; or how far personal bias has interfered with the due carrying out of the provisions of the law.

EXTERNAL DECORATION—PAINTED OR RELIEF.

THE application of colour to our buildings will always remain one of the vexed questions which trouble the profession. Of course there are those who, having no settled theory of their own in the matter, have not the slightest doubt about its propriety, and who would have no more hesitation in decorating their building with colour than carving or anything else their means allowed. But we are now referring to others who have decided principles of their own, and who employ colour upon recognised rules. Some time since we referred to the painted decorations the Reform Club, in Pall Mall, had undergone from the designs of Mr. E. M. Barry, R.A, ; we now notice that another club house in the same street, the Athenæum, has been subjected to the periodical cleaning and repair, that its rich frieze with figures in bas relief has been coloured in the background a bright red, while the spaces between the balcony cantilevers, and triglyphs are painted blue. There will be found critics who will not scruple to call in question, if not condemn, this treatment, and others who will justify it. Apart from the question whether colour really adds to the beauty of an architectural structure such as the Parthenon, we have to consider whether the practice of accentuating form by colour is admissible. Polychromatic architecture has been the theme of many foreign and English art-critics. Herr Semper, a well-known German architect, has proved that the Greeks carried the painting of their temples to a perfection that the remains hardly enable us to realise. We have at least clear evidence, from actual remains and upon the authority of Herr Semper, Viollet-le-Duc, Owen Jones, and others, that the Greeks were in the habit of picking out the members and ornaments of their buildings. So far, then, there is precedent for such a proceeding as that of painting the background of relieved figures upon the external frieze of the Athenæum, the only doubt remaining being whether in this particular instance the proceeding is justified. The Athenæum clubhouse is designed in the Greek astylar manner; the style may be called Greco-Italian. Mr. Decimus Burton was the architect. There are no superposed orders, as we find at the Carlton or in the United Service club-houses, but the cornice is made the dominant crowning member of the whole building. In the Carlton, and United Service, and other façades in Pall Mall the upper cornice is necessarily proportioned to the order below it or to its own ordinance, and is, therefore, disproportioned to the elevation as a whole; but at the Athenæum the cornice is proportioned to the entire height of the front, and, therefore, becomes a characteristic feature of the building, imparting dignity and breadth to the whole composition. It is desirable to bear this distinction in mind before passing an opinion upon the merits of the painted frieze which forms a portion of the crowning cornice itself. In this case the bas-relief breaks up pleasingly the deep-cast shadow the cornice would throw upon the wall, and the colour in the background enhances the effect. A plain frieze, or one in which the figures of the composition were not relieved by a darker background, would be clearly heavy and unsatisfactory, and the interest in the façade would be lost to a great extent. We consider the style of the Athenæum, the Travellers', and Reform Clubs to be better suited for colour-decoration than the more ornate or Palladian species of composition, inasmuch that the wall-surfaces are plain and unbroken, and depend more for effect upon simple projections, the contrast of light and shade; while in the last-named kind of buildings the relief is full, ample and varied by the use of orders and the effects of deep shadows. The sculptured frieze at the Athenæum Club-house is composed of Greek figures, and apparently represents the Panathenaic procession. Probably the original frieze of this subject in the Parthenon was relieved by a coloured background, as, no doubt, were also the figures in the tympanum, the lacunaria, and other of the recessed parts of that structure.

These recent instances lead us to dwell upon the more general subject of colour-decoration, or rather the application of colour to our buildings. There are evidently two distinct cases to consider: the first is that in which colour is applied simply as relief, either to the background or flat surfaces of a wall; and the second, where colour is used indiscriminately to exalt the prominent members as well, and in fact to heighten the architectural effect by the employment of colour generally. We have evidence the ancient Greeks confined themselves mainly to the former mode of decoration, and that the painted gesso tints found upon their walls, columns, and entablatures were applied primarily to lessen the glare the sun would have had upon the white marble itself, and to add to the architectural effect of certain parts by bringing them into prominence or otherwise. We would here merely say that the method of relief, or the tinting of portions of buildings, is one that commends itself to the architect in large towns rather than the adoption of a more costly, complete, or pictorial mode of colour decoration. Architects in London have tried every conceivable kind of decoration, coloured brick and tile, inlays of various kinds, with the almost inevitable result that in a few years the buildings wear the same monotonous and begrimed appearance as if they had been built of one material. Any one passing through Holborn, Queen Victoria-street, or any of our newly-made or altered thoroughfares will at once see that all attempts to produce contrast by the use of materials of different colours have to a large extent failed, and that if any advantage has been obtained it is in the use of red brick with stone in the larger surfaces of a building. Stuccoed fronts are exposed to the neutralising effects of smoke to an even greater degree, but the facility with which stucco may be coloured suggests the value of toning the surfaces by the addition of colour to them. The Hotel Continental, Regent Street, a stuccoed building, has been painted in this manner, the wall surfaces between the columns and window-dressings being painted a salmon tint, and the latter features a blue or French grey. The effect of painting in a darker tone the spaces between pilasters and columnar windows and doorways is to call attention to the architectural lines and features, and however dirty the structure becomes in time, the difference of tint still remains. The monotonous drab of stucco, such as the present colour of the Athenæum in the interfenestral spaces, obscures or obliterates all the lines and smaller breaks in a façade, and it is only by painting of a lighter colour the window-dressings that any contrast can be made, and that the drabby tone of the walls is made to contribute to the general appearance. But the employment of colour has generally been of a more positive kind. Instead of being used merely as a relief to surfaces and sculptured detail, it has been usually applied as a decorative accessory to architectural form. The modern artist has made the decoration of our buildings quite a distinct art, or rather we may say, trade. He takes the walls and ceilings of a building as the legitimate field for the display of his taste. His object is not to relieve the surfaces, and to pick out the architecture, so much as to paint them in accordance with a general scheme which he has laid down. Sometimes he is controlled by considerations of light, the wants of the apartments, the aspect they face; but these are of a rather vague and indeterminate character, if we are to judge from the examples of polychrome decoration to be found in some of the new residences at the West-end. If our polychromists are to work upon sound principles, they should have recourse to good models, and not be led into the temptation of fancying they are all inspired Giottos. Architectural colourists have been broadly divided into two great classes, "constructional" and "decorative." With the former the lines and features of a building receive the principal care, and this scheme of colouring has been the guiding principle in all ancient works. The Egyptian and Athenian temples were coloured upon this system, and, without prejudicing the other mode, we may say it obeys the great rule, without which all attempts at decoration are futile and destructive, namely, that form should precede colour, and that coloured decoration should be subservient to architecture. The decorative artist, on the other hand, owes no allegiance to the building; he considers its surfaces the fitting vehicle for his colour decorations, and treats the architecture simply as the framework, so to speak, of his creations. He generally deals with the higher subjects of painting. These two very opposite principles of conduct are still enforced by our leading polychromatists of the respective schools. In many cases both these systems have been adopted in the same building with something like a complete failure and the total subjugation of all architecture. Every member becomes subdued by overpowering colour; light and shadow, the effect of mouldings, breaks and recesses, are completely changed or neutralised by hues of wrong tone and depth, and structural integrity is destroyed. Instances of glaring misapplication of colour are to be met with in London by the score, and clearly exemplify the necessity of adhering to some well-understood rule of external coloured decoration, which shall either define and reinforce, or simply throw up and relieve the details and sculptured ornament by imparting colour or tone to the retiring surfaces.

THE OLD STONE MILL AT NEWPORT, RHODE ISLAND.

THERE are certain classes of old buildings which still perplex the antiquary and architect. Such are the circular towers known as Pictish towers in the north of Scotland, composed chiefly of clay-slate slabs, and of which the Burgh-Mousa is a well-known instance. Not only in this country but in America there are to be found peculiar structures that baffle the investigations of students. Among the latter is the "Old Mill" of Newport, in Rhode Island, which has many points of resemblance to the Leamington Mill of Inigo Jones. The Newport structure is of rubble stone, circular on plan, about 18ft. 9in. internal diameter, and about 25ft. in height, resting upon a circular arcade of eight arches of rude construction. Above the arcade the tower is pierced by a few openings of irregular disposition. Of course a variety of conjectures have been formed till quite a literature has grown round this peculiar structure. One writer attempts to prove that this grey, time-worn tower is Norman—a ruined baptistry which owes its origin to the roving followers of Lief-Ericksen. The late Mr. R. G. Hatfield, President of the New York Chapter of the American Institute, an accomplished architect, has endeavoured to show that the "Old Mill" was erected early in the 11th century by the Northmen, who founded the Vinland colony: and others maintain that this structure was erected in the latter part of the 17th century by English colonists for the purpose of grinding Indian corn. Mr. George C. Mason, jun., takes the latter view, and in a very interesting paper, contributed to the current part of the "Magazine of American History, with Notes and Queries," argues from the constructive features of the building that it belongs to the last quarter of the 17th century. Unfortunately for Mr. Mason's theory, it dispels rather roughly the traditional charm of antiquity which has been thrown over this singular structure; it takes it out of the region of historical speculation and mystery, and brings it down to so recent an age that the interest hitherto attached to it is considerably diminished. Let us here try to follow Mr. Mason's account of the "Old Mill," which is illustrated from carefully-measured drawings, showing the position of every stone. Sketches of the Leamington or Chesterton Mill are also given for comparison. Mr. Mason says;—"This survey was made in October, 1878, and was commenced with a firm belief in the old and pleasant traditions so delightfully presented by Mr. Hatfield. But with all an architect's veneration for the works of his predecessors, and a natural desire to assign to the monuments of our country their greatest possible antiquity, I have found myself confronted with constructive features which point to the last quarter of the 17th century as the time when the structure was built, and to Governor Benedict Arnold as the designer, as well as owner of the Old Stone Mill." There are but two available dates—the colonisation of Vinland, and the English settlement on Aquidneck. Mr. Mason says that all theories which regard the edifice as having been once a Norman baptistry are based upon the supposition of certain changes having been made at various times in its interior, and he endeavours to show that it would have been difficult to have effected such changes, even if they were not practically impossible. Some have thought it was erected for a windmill, though there are certain peculiarities that contradict such an idea. Mr. Mason then describes in detail the fireplace and the windows, the two features that have been considered alterations to the original structure, or recent additions made by English colonists. The first-floor has also been claimed as an addition, but no allusion has been made to a second-floor and staircase, of which clear evidences exist. First, referring to the fireplace, Mr. Mason describes it as being directly over one of the piers, carefully worked with closely-fitted stones in marked contrast to the rest of the interior. The hearth is a flat slab of slate, 6in. thick, built under the splayed jambs several inches at each end; the opening has a segmental arch, and has a flat roof one foot above the crown, composed of flat slate stones laid vertically with the axis of wall, at each end of which is a flue, 5in. by 8in., one of them, the north flue, being nearly vertical, while the other is curved to the south. Both flues open out on the face of wall below the top. The north flue shows no pargetting, but the south is still perfectly parged, the mortar being the same as that used in the construction of the piers. The author contends that it would have been impossible to have inserted such a fireplace in the old structure, to have adjusted the back, jambs and roof with such nicety without visible disturbance of the old walls, and that if it had been done the artificers would have been satisfied with one instead of two flues. The windows are placed irregularly, without regard to the intercolumniation, but all other features are symmetrically arranged, and the piers themselves are set out on the true cardinal points of the compass. The illustrations show splayed reveals on both sides to the windows, with a square jamb of 4in. in the centre. The sills are of two flat stones laid 4in. apart, cut to the jambs; the edges of sills are square cut towards the centre, and terminate in mortises 4in. square sunk in the jambs, evidently to receive the wooden sill. The heads have lintels similarly made. Mr. Mason thinks it very improbable that these could have been changes, from the clean, smooth appearance of the mortises. Speaking of the floors, the author believes, from the mortises cut in the walls over the piers, that there were two parallel beams each way, the pair crossing; and no doubt the circular plan would suggest this mode of construction. The mortises are still plastered, and indicate beams 10in. square. Above these other beams were laid, and over them heavy planking, which would bring the level of floor up to that of hearth. The second-floor was carried apparently at a height of about 20ft. above the ground-level where a diminution of the thickness of wall occurs, and the traces of a staircase are to found on one side. A running mortise, 6in. deep and 6in. high, exists along the top of the offset, and this, no doubt, received the timbers, which were framed similarly to those below. Mr. Mason observes with a show of reason that these constructive features seem to prove that the ruined tower on Rhode Island was not a baptistry, but that it owes its origin to English colonists.

The author next compares the "Old Mill" with the well-known Leamington Mill in this country, said to be designed by Inigo Jones in 1632. For an illustration of this structure we may refer our readers to Knight's "Old England," and we may add the Architectural Association, when they visited Warwickshire in 1877, inspected this unique and very analogous example. Mr. Hatfield rejects the theory that the Leamington Mill furnished the *motif* for the Newport structure, and for certain reasons. The Newport one has eight arches with round piers, the latter being placed upon the cardinal points of the compass, and projecting from face of wall; while the Leamington Mill has but six arches with square piers placed directly under the (axis ?) wall of the superstructure. The Leamington Mill is built of cut stone, that at Newport of random rubble; but, as the author observes, these differences in execution can be readily accounted for from the fact that the Warwickshire mill was built of materials skilfully worked under the eye of a skilled architect, while the one at Rhode Island had to be built with appliances at hand in a destitute colony. As regards to the projection of the piers beyond the face of wall at the Newport structure, we do not see any considerable point of difference, or one that makes it improbable the Leamington model was followed. The arcade in the last case entirely projects beyond the upper wall, and is marked by a moulded string-course. Mr. Mason asks why should the colonists adopt the Leamington mill as a model? We give his answer. "The Leamington mill was erected in 1632. Governor Benedict Arnold was at that time in England, and resided in Warwickshire, not far from the site of the mill. He mentions in his will a farm called his Leamington farm. In 1663 Rhode Island colonists built their first windmill, as we gather from Peter Easton's Diary, and on August 28, 1675, he notes, in same diary: 'On Saturday night, 40 years after the great storm of 1635, came much the like storm, blew down our windmill and did much harm.'" This mill was of wood. Governor Arnold made his will December 20th, 1677, two years and four months after the gale. "During that time," it is suggested, "he may have erected a second and more enduring structure of stone, keeping in mind the model which he had seen at Leamington. He may have wished to provide a place of safe retreat against his Indian foes, to whom he was obnoxious," and he seems to have not been on the most friendly terms with the colonists. The author thus establishes, upon almost irrefutable evidence of a circumstantial kind, the modern origin of the Old Mill. He has analysed the mortar taken from it and other structures of the period, which was found to be of shell-lime, sand, and gravel, with pounded slate; and from the solidity of the construction of Governor Arnold's house additional weight in favour of the colonial origin of the structure is afforded. The early colonists also built their houses with rough stone, and plastered them with stucco. Mr. Mason refers to the disposition of the eight piers on the cardinal points of the compass, and thinks this feature to have been the result of deliberate thought and careful measurement. The true north bisects one of the piers, and it is certainly a query whether the builders calculated the variation of the needle to discover it or not.

VIOLLET-LE-DUC.

EUGENE EMANUEL VIOLLET-LE-DUC, the eminent architect and archæologist, died on the 18th inst. of apoplexy at Lausanne. He was born in Paris in 1814, and passed through the usual course of architectural study at the Ecole des Beaux Arts, without, however, distinguishing himself (except as a draughtsman), in a school with the principles of whose teaching he had little sympathy. Starting at an early age on his travels through France and Italy, he returned to Paris at a time when, through the labours of Monsieur Vitet, a special interest was being taken in the preservation of the ancient historical monuments of France. When the "Commission des Monuments Historiques" was formed M. Viollet le Duc became one of its chief advisers, and in 1840 was intrusted with the restoration of the Abbey Church of Vezelay, on which he published a "monographie" in 1873. Later on, in 1845, he was associated with M. Lassus in the restoration of Notre Dame, at Paris, and designed the "flèche" and "sacristie," the latter, perhaps, one of the best of his original works. The Sainte Chapelle (with M. Duban), the cathedrals of Amiens, Sens, and Laon, the Abbey of St. Denis, the church at Verdun and St. Saturnin at Toulouse, the fortifications of Carcassonne and the Chateau of

Pierrefonds, were all subsequently restored by him, the most interesting of these, perhaps, being the Chateau of Pierrefonds, the restoration of which was commenced in 1859. It had been the intention of the late emperor to restore the Chateau of Coucy, but the proximity of Pierrefonds to Compiègne, the summer residence of the Imperial family, led to its selection, and amongst the circle of guests invited each year successively to Compiègne the name of M. Viollet-le-Duc invariably figured. In 1863 he persuaded the Emperor to make some changes in the system of instruction pursued at the Ecole des Beaux Arts, and was himself appointed Professor of Construction. The students, however, refused to listen to his lectures; but many of the reforms which he proposed were carried out, to the advantage of the school. The radical changes which he desired to make in a school, the traditional teaching of which had lasted some 200 years, made him especially objectionable to the members of the Institute of France, and he was never elected into their body, though M. Abadie, holding the same principles, and who has of late years succeeded to many of the posts resigned by M. Le Duc, was elected three years ago. It was, however, as a writer on architectural history that M. Viollet-le-Duc acquired his chief fame in this country, if not in France. In 1854 he commenced his "Dictionnaire Raisonné de l'Architecture Française du XI^{me} au XVI^{me} Siècle." It was intended at first to consist of two or three volumes, but the success of the first issue, even among the students of the Ecole, was so great that he was induced to enlarge its sphere, and to extend its publication to ten volumes, lasting over a period of 14 years. Encouraged by its success, in 1858 M. Le Duc commenced his work on the "Mobilier Français de l'Epoque Carlovingienne à la Renaissance." This also was to have consisted of two volumes, as stated in the preface. It was increased to six, the subdivisions being—Vol. I. Mobilier Tentures; II. Ustensiles outils instruments; III. Orfevrie; IV. Habits vêtements; V. Armes equipments; VI. Bijoux—the last volume extant some three years ago only. In 1854 he published his work on the military architecture of the Middle Ages—a portion of which had been embodied in his "Dictionnaire," and it was in this work that he displayed his great knowledge of the military tactics of all ages, and which probably contributed in no slight measure to his intimacy with the late Emperor, for whom the study possessed great fascination. The pamphlets on "The Chateaux of Coucy and Pierrefonds" was published in 1857. In 1860 M. Le Duc commenced what may be looked upon in some respects as the most brilliant of his works, "Les Entretiens sur l'Architecture," a course of lectures which he had prepared to deliver to students, but which the opposition of the members of the Institute and the professors of the Ecole des Beaux Arts prevented his so doing. It would be impossible to conceive a more suggestive course of reasoning for architectural students than that which is contained in this work, the first volume of which has been translated into English by Mr. Bucknall. It seems to impart new life to the dead bones of Greek and Roman art, and places them on a new footing. Just as in the "Dictionnaire Raisonné," the principles on which Pointed Architecture was developed are set forth; so in the "Entretiens" similar reasoning is applied to the works of the Greeks and Romans, and the Byzantine school. M. Viollet-le-Duc seems to have entered into the spirit of the successive ages, and in each to suggest a new course of design. It is possible in some cases that his knowledge of the architecture of subsequent ages may have led him to give more credit to the architects of Greece and Rome than they can fairly lay claim to; but in a work which was not intended to serve as a dry record of archæological history, a classification of ancient buildings, and the proportions of their several parts, but to awaken an interest in students, to lead them to reason on the principles on which ancient buildings were designed, so as to apply these principles to their own designs, whether made for the purposes of study or for execution, this work is invaluable. In some of his later works M. le Duc seems to have kept this same object in view, and in the architectural novel, "How to Build a House," published in 1873, ("L'Histoire d'un Maison"), "Les Annales d'une Forteresse" (1874), "L'Histoire de l'Habitation humaine depuis les Temps prehistoriques jusqu'à nos Jours" (1874), "L'Architecture Russe" (1876), and his last work, "Histoire d'un Hotel de Ville et d'une Cathedrale," the same principles are observed, and new life and interest are imparted and awakened in the buildings of bygone ages.

We have before commented on M. Le Duc's real knowledge of military tactics. In 1870-71, during the war, he was appointed Colonel of Engineers, and assisted materially in the protection of Paris during the siege. He had, it is said, long before projected schemes of fortification for Paris, which would, if they had been adopted, have rendered the investment of Paris impossible. At the close of the war, before the Prussians were able to obliterate the traces of their earthworks, he took notes of the same and published them in a work entitled, "Mémoirs sur la Défense de Paris."

On the establishment of the Republic his love of change and variety seems to have plunged him into the chaos of political life; he became a member of the Paris Municipality in 1875, resigned his post as Inspecteur Ecclesiastique des Monuments Historiques, and, with the exception of the few works we have enumerated, seemed to have abandoned his architectural career. He was a commander of the Legion of Honour, and the only architect honorary member of our Royal Academy.

The *Times* Paris correspondent writes—The distinguished architect and art critic, M. Eugène Emanuel Viollet-le-Duc, died of apoplexy, at his summer retreat at Lausanne, last night. He was born in Paris in 1814, studied under Leclerc, and early showed a bent for Gothic architecture. After familiarising himself with the remains of Greek and Roman art in Rome, Sicily, and Southern France, he was intrusted in 1840, by the Historical Monument Commission, with the restoration of Vezelay Abbey. In 1845 he shared with Lassus in the restoration of Notre Dame and the rebuilding of the sacristy. In the following year he became architect of St. Denis, and in the following years he restored the fortifications of Carcassonne, Amiens Cathedral, and Sens. Appointed in 1853 one of the three ecclesiastical inspectors, he superintended the restoration of Chalons church, Laon Cathedral, and the Castle of Pierrefonds. He was for a short time professor of art-history at the School of Fine Arts. His literary works, all bearing on architecture, are too numerous to mention. His "Dictionnaire Raisonné de l'Architecture Française du 11e au 16e Siècle" obtained two prizes from the Institute. His admiration of mediæval structures permeates all his writings. In 1875 he became a member of the Paris Municipality, when his Republican professions exposed him to the bitter resentment of the Bonapartists, who twitted him with the patronage extended to him by the Emperor. Not long ago he had to protest against the Radical bigotry which refused to allow a statue of Charlemagne to be even temporarily erected, because Charlemagne was a Sovereign. His death is an irreparable loss to French art. His brother Alexander was a landscape painter, and another member of the family was a painter in water-colours.

The Paris correspondent of the *Guardian* writes:—Another well-known name which has disappeared is that of M. Viollet-de-Duc, author, besides many other other works, of the celebrated "Dictionnaire raisonné de l'Architecture" in some twenty volumes, and the most complete publication of the kind probably which exists. He has been the restorer, and generally with acknowledged success, of more churches and public buildings than any other man in France; and, in point of their importance, than perhaps all other architects put together. It is only necessary to mention the Sainte Chapelle and Notre Dame at Paris, the cathedral at Amiens, that now in progress at Laon, the church of Sernin, at Toulouse, and the Chateau de Pierrefonds, near Compiègne, and many others. M. Le Duc was born in 1814. Early in the Empire he was made Inspector-General of diocesan edifices and raised to the rank of Commander in the Legion of Honour. Unfortunately, the end of his career has scarcely been so creditable to him as the beginning. Although loaded with favours by the Empire, and almost the spoilt child of Imperial patronage, he suddenly threw himself into violent, not to say ungrateful, opposition, became a declared Radical, and died one of the most Radical members of the Radical Town Council of Paris. He died at Lausanne of a fit of apoplexy, and is to be buried there according to the terms of his will, which directs that he is to be interred wherever his death might take place.

The *Echo* says:—The great French architect, M. Viollet-le-Duc, who died in his Swiss home at Lausanne last week, was a standing astonishment to the French clergy. Probably no other man amongst his contemporaries had so profound an acquaintance with Mediæval art, or such an impassioned feeling for it. This is evident, not only in his scholarly writings, but in his magnificent restorations of the cathedrals of Notre Dame in Paris and of Amiens, and also of that most marvellous piece of work, the Sainte Chapelle, behind the Palace of Justice. He was equally at home in his knowledge and appreciative treatment of the castles of the old French aristocracy, as he has shown at Pierrefont and at Eu. Nevertheless, M. Viollet-le-Duc was one of the most decided of French anticlericals, and in his later years an advanced Republican. During the Napoleonic Empire he did not trouble himself about politics, and it is to be presumed, from his acceptance of a Commandership of the Legion of Honour from the Emperor's hands, and his participation in the amusements of the Imperial Court at Compiègne, that he must have quieted his conscience with the casuistic axiom that he was an artist first and a Republican afterwards. Hence, after the fall of the Empire and his fervid announcement of Republican convictions, the great architect naturally found himself in much the same position as his collaborateur in the *XIXme Siècle*, M. Edmond About. Dean Close, if we mistake not, once wrote a pamphlet which was very popular with certain Evangelicals, in which he maintained the thesis that the restoration of churches is invariably a first step towards Popery. The experience of the most eminent of modern Continental church-restorers would seem to convey the very opposite moral. The cardinals and bishops who employed him, and observed his zeal in his work, and his scrupulous piety (in an architectural sense), probably thought him a living instance of the adage, "The nearer the church the further from God." It is worth observing that one of the greatest experts in English ecclesiastical architecture was a Quaker.

STONE AND CONCRETE.

THE architect, in the choice of a building-stone, has undoubted difficulties to encounter; he has to choose between a stone which is known to resist the chemical agencies of the atmosphere and one that will hardly stand the first winter of exposure. If the building is in a large smoky town another element of destruction enters; he has to consider the disintegrating effect of the carbonic acid in the atmosphere upon the carbonate of lime he has selected, Portland stone or other limestone. The architect cannot afford the time to select his own stone, even if he were quite qualified to do so, and it is consequently left to the contractor or his foreman. We need not observe what the result of these circumstances has been. Nearly all our important stone buildings in London exhibit signs of a speedy decay, or of such a general obliteration of detail that their interest architecturally cannot outlast the present century. We cannot wonder that the architect turns his attention to artificial fabrications, such as bricks and tiles, concrete and terra-cotta. The whole geological series of rocks appear to succumb to the disintegrating atmospheres of our large towns. Manchester, Birmingham, and London in their stone buildings afford ample evidence of the unsuitablity of some limestones to resist smoke and damp in combination—two of the most active agents of destruction. Mr. H. Reid, in his new work on "Natural and Artificial Concrete," noticed by us recently, thus speaks of the scarcity of good Portland stone, and the great blunder in using an improper stone for the Houses of Parliament: "The stone used in the construction of this important national building is a magnesian limestone from Bolsover in Derbyshire. The best varieties of this formation are those which in the chemical analysis represent nearly equal proportions of the carbonates of lime and magnesia. When in that state it is highly crystalline in character, and exhibits externally all the qualities of a durable stone. . . . The stone selected after much deliberate inquiry and examination was of the following analysis:—

Carbonate of lime	51·1
Carbonate of magnesia	40·2
Silica	3·6
Iron and alumina	1·8
Water and loss	3·3
	100·0

In a short time, however, unmistakable proof was given that the stone so carefully selected was unsuitable for building in a London atmosphere, and that the generation who witnessed the erection of the Houses of Parliament would also have practical evidence of their premature decay. There were numerous specifics of a chemical character, and a great number, no doubt, of wonderful nostrums forthcoming to preserve, if not regenerate, the crumbling stone. All, however, proved futile, and the building in its most ornate parts still exhibits rapid and uncontrollable decay, rendering it dangerous for those requiring to pass to and fro along its external fronts or internal quadrangle." Mr. Reid goes on to say that the error was doubtless due to a "reliance on the condition of those buildings standing in the locality of the quarry and surrounded by a pure Derbyshire atmosphere." Even the west side of St. Paul's cathedral exhibits a considerable exfoliation of surface, or a film-like coating may be observed to have detached itself in parts of the façade. English granites, too, are not proof against the destructive action of the acid-laden atmosphere of our towns. London and Waterloo bridges, one built of Devonshire and the other of Cornish granite, appear to resist any suspicion of having been built of perishable material. But the evidence of our own senses is sufficient to convince us of the disintegrating effects of a London atmosphere even upon these materials. Mr. Reid observes that examination will prove that in point of durability the Scotch exceeds in value the Cornish. In both the structures we have named the granite is found to be either honeycombed in parts or much disintegrated, producing a rough and uneven surface. Other instances may be mentioned to prove that granite is subject to the same chemical or solvent action of our atmosphere, or that at least one of its ingredients is susceptible to decay.

The advantage of using concrete is that we have undoubted knowledge of its durability under conditions of the most trying nature. We can select our own ingredients or aggregates and cementing agents, and by careful amalgamation obtain a compound that can resist all ordinary mechanical or chemical agencies, the only objection to its employment being the rather sentimental one of using a material which has not the sanction of tradition in its favour, and which does not afford the means for sculptural embellishment that stone does. It has not occurred to many that both materials might be employed in juxtaposition for decorative purposes. We might face or build our walls with concrete or béton, and still use the most durable stones for architectural dressings and ornamentation. Concrete or stuccoed surfaces would admit of various kinds of decorative finish, and combine admirably with any other material known to the builder. Our finely-cut mouldings might still be left to the stonemason, our sculptural embellishments to the carver, and we might really erect grand monumental and artistic buildings that for durability and beauty would vie with, if not surpass, any of the historic structures upon which we have so long set our faith, and which architects still regard with well-founded veneration.

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TEWKESBURY ABBEY.

THE restoration of Tewkesbury Abbey is now so far completed that an octave of services in connexion with its reopening commenced on Tuesday. A proposal for the restoration of the edifice was brought before the public nearly 20 years ago, and in 1863 a thorough restoration of the whole fabric was determined on. Shortly afterwards the late Sir Gilbert Scott was instructed to examine the building, and from his report to a meeting held in August, 1864, it appeared that the contemplated work, to be done effectively, would involve an outlay of from £8,000 to £10,000, and that if it was desired to preserve the building it was absolutely necessary that it should be carried out in as complete a form as possible and as soon as circumstances would allow. Subscription lists were at once opened, but, with the exception of some preliminary work, nothing was done until 1875. Arrangements were then made for holding the services of the church in a portion of the nave, and the choir portion of the building was handed over to the contractor. In the autumn of 1877 the choir portion was again reopened for service, and the restoration of the nave proceeded with. This has now been completed. The total cost of the work which has been done is a little more than £9,000, and nearly £7,000 more is required for the completion of the restoration in accordance with Sir Gibert Scott's recommendations. The work completed is paid for, and there is a small balance in hand. Of the total sum raised, about £5,500 was raised in Gloucestershire, and over £2,000 of that amount in Tewkesbury; the county of Worcester, on the border of which Tewkesbury is situated, subscribed about £2,000; and the remainder was subscribed in London and various parts of the country.

Tewkesbury Abbey is built mainly in two styles of architecture—Norman, of a very plain type, and a beautiful variety of Middle Decorated. Architecturally, according to the *Times*, it is one of three sister churches in the same district, all of which, in the opinion of Sir Gilbert Scott, were designed by the same architect and on the same leading idea, and all, while resembling each other, differing from any other Norman churches. The three churches are Gloucester Cathedral, Tewkesbury Abbey, and Pershore Church. The points of resemblance are these:—(1) That the plan is much the same apparently in all; (2) that in all the pillars are vast and round; and (3) that in each the design of the nave and choir differs in this, that, whereas the nave has lofty pillars, arcades, and aisles, in the choir there are two arcades and aisles, one above the other; so that, while on the western side of the transepts a lofty arch opens into the aisle of the nave, on the eastern side two arches of low proportion open severally into the lower and upper aisles of the choir. The church is cruciform, taking in its ground plan the form of the Latin Cross. It consists of a long nave with aisles, north and south transepts, and a choir with ambulatory, terminated at its eastern end in a sexagonal form, with three chantry chapels or oratories on the south side and two on the north. Against the eastern side of the south transept is a small apsidal chapel, and in a corresponding position against the north transept is a 13th century chapel, which is commonly known as the chapter-house. The two principal features of the exterior of the edifice are the tower and a vast recessed arch at the west end of the nave. The tower, which is in the centre, is not unlike in aspect that at St. Alban's, the latter, however, being of Roman brick, while that at Tewkesbury is of stone. It has a plain base, on each side of which two windows are introduced, with an ornamented superstructure graduated in three stages, above which is an embattled parapet, with lofty clustered pinnacles at the angles. The tower was originally surmounted by a spire, which is recorded to have fallen in 1559, and the battlements and pinnacles were added shortly afterwards. The arch at the west end of the nave is 65ft. in height and 34ft. wide at its outermost point, and inserted in it is a large window of late date. The original intention of the designer of the façade has led to a good deal of discussion among antiquaries. It is thought that at one time the arch was filled in with a wall pierced with Norman windows, and that it was intended to be flanked by western towers, somewhat like the west fronts of Lincoln and Peterborough. The arch is recessed in six orders of shafts, and a seventh is bedded into a later wall; and in one of his reports Sir Gilbert Scott said the west end of the nave was, so far as he knew, quite unique. The same authority considered that in its purely Norman form, when first erected, the church was one of the finest buildings of the period, "plain and simple to a degree, but gloriously noble in its proportions, and with every feature about it indicating a nobility of thought which almost disdained minute architectural detail." The building of the church was begun near the end of the 11th century, and it was completed and consecrated to St. Mary in 1123. Within 100 years some important alterations were made. The apsidal chapel of the north transept was converted into a square chapel, as is proved by a number of capitals in the chapel of a semi-Transitional character. A chapel consisting of nave and chancel was next erected against the front of the north transept. The nave is now indicated by the wall-ribs of its vaulting against the transept front; the chancel still remains, though much altered, and its walls are surrounded by beautiful arcading. In the 14th century some alterations were made on a grand scale. With the exception of the pillars, the whole eastern arm of the church was reconstructed from Norman into the Decorated architecture of the 14th century. The Norman pillars were heightened (without removing the capitals) by two or three feet, and richly-moulded pointed arches erected upon them, over which was raised a clerestory in the Decorated style, still filled with the original 14th-century glass. The aisles were rebuilt in the same style, with a group of chapels projecting from them like a French *chevet*; while to the east was erected a Lady chapel, of which but small remains now exist. The vaulting of the wide spaces of the choir, the nave, and the transepts, which till then had been covered with open timber roofs, was commenced at about the same time. A few of the stalls and the sedilia of the age of the remodelling of the building are retained. The works of mediæval date subsequent to (and some of them contemporary with) the change alluded to, consist mainly of a series of monuments which form one of the most interesting features of the church. The abbey was included by the commissioners of Henry VIII. in their list of buildings condemned as unnecessary or superfluous. A monastery which adjoined the abbey was destroyed, and was the last of the religious houses in Gloucestershire to surrender; but the inhabitants of Tewkesbury petitioned for the abbey to be spared, and their request was acceded to conditionally that it was purchased by the bailiff, burgesses, and commonalty of the town, for the sum of £483, a sum equivalent to more than £5,000 of the present day. The price was determined by the value of the bells in the tower and the lead, as fixed by the Court of Augmentation.

The work of restoration is divided into three stages, two of which are completed, and the third has yet to be begun. The work of the first stage occupied about two years, and comprised the restoration of the choir and its chapels, the tower, the transepts, and two bays of the nave. Some obstructive galleries and pews and the organ-loft were cleared away, after which the walls, pillars, and ceilings were thoroughly cleaned, by freeing them from the many coats of whitewash which had effectually concealed their beauty. The modern flooring was entirely removed, and the floor made ready to receive a suitable pavement. Where the columns and walls of the choir had been cut into and defaced for the purpose of supporting the beams of galleries or other modern erections they were thoroughly repaired, and portions of responds which had been entirely cut away were rebuilt. The partial colouring and gilding on the vaults of the choir were restored to their original state, as were also the artistic and historical bosses in the tower, the transepts, and the two eastern bays of nave. In the east wall of the south transept, and immediately over the apsidal chapel, an almost unique Norman chamber was discovered, and by the removal of rubble which blocked up a fine arch it was opened out again to the church. It is accessible from the general staircase which formerly led from the monastic buildings to the church, and through it to a Norman triforium which existed before the present clerestory was erected. In the centre of the ceiling of this chapel is a beautiful fresco, coeval with, or very little subsequent to, its erection in the 12th century. The 13th-century chapels east and north of the north transept, which had been completely built in and shut off from the church by a thick wall of masonry, were once more opened to the church. Three chapels were also restored, so far as the repair of stonework, the reopening of windows, and the decoration of ceilings were concerned. Just before the work of the first stage of the restoration was completed—viz., in March, 1877, a meeting was held at Lambeth Palace, under the presidency of the Bishop of Gloucester and Bristol, when a national committee was formed to aid the local committee in completing the restoration of the abbey. The work to be done in the second stage, for which a national appeal was made, consisted of the removal of all plastering and whitewash from the walls, pillars, piers, arching and vaulting of the westernmost bays; the repair of the flooring in the transepts, ambulatories and chapels; the new roofing and restoration of the 13th century chapels, opening out of the north ambulatory; the provision of seats, screens, pulpit, reading desk, lectern, &c.; the restoration of the sedilia, of the chapels, and the preservation of the seven ancient windows of the choir clerestory where necessary; and the erection of a reredos, if one should eventually be thought suitable to the style of the abbey. The greater portion of this work has been done, that yet remaining to be done being the provision of screens, pulpit, seats, and nearly all the interior fittings; the erection of a reredos, the design for which has been supplied by Mr. J. O. Scott, who has succeeded his father as architect of the restoration; and the reparation of the sedilia. The restoration of the 13th-century chapel on the east side of the north transept was undertaken by the Provincial Grand Lodge of Freemasons of Gloucestershire, who took part in the ceremony of opening the chapel yesterday (Thursday). In the nave an important work has been done in addition to that originally contemplated. The bosses of the groining showed signs of their ancient decoration, and it was determined to restore them. The central range of bosses is carved with scenes from the life of our Lord, and the two side rows are occupied with angels bearing censers or playing upon musical instruments. The first attempt at colouring was not successful, but ultimately Mr. Gambier Parry proposed a mode of treatment which he is himself carrying out with great skill and judgment. The organ of the abbey is of considerable historical interest. It was purchased for Magdalen College Chapel in 1637, and removed thence to Hampton Court by Oliver Cromwell. It has been re-erected according to the recommendations of Sir F. Ouseley and the specifications of Mr. W. H. Willis, and is placed beneath the north arch of the central tower. The third stage of the work of restoration, which will be entered on as soon as funds permit, will include the erection of a reredos, the reparation of the sedilia and monumental chapels, a new choir screen, a pulpit, and some extensive repairs to the exterior. The estimated cost of this is nearly £7,000. The contractor for the restoration work is Mr. Thomas Collins, of Tewkesbury, whose liberal conduct and public spirit have been frequently acknowledged by the restoration Committee, of whom Sir Edmund Lechmere is the chairman.

The history of Tewkesbury Abbey is almost identical with the history of the Fitz-Hamon house. The abbey was founded by Robert Fitz-Hamon, cousin of the Conqueror, William Rufus having conferred upon him the honour of Gloucester, which included the lordship of Tewkesbury. His remains are interred on the north side of the choir, their resting-place being marked by a splendid monument erected by Abbot Parker in the latter end of the 14th century. The work designed by Robert Fitz-Hamon was completed by Earl Robert, son of Henry I. In 1221 the earldom was carried into the families of the Clares by the succession of Gilbert de Clare, who was also Earl of Hertford, and inherited the honour of Gloucester through his mother. As lords of Tewkesbury, successive generations of the De Clares held the patronage of the abbey for three-quarters of a century, and most of them found sepulture within its walls. The male line of De Clare came to an end with Gilbert, tenth Earl of Gloucester, who was killed at the battle of Bannockburn, and the abbey then passed in a female line to the baronial house of the De Spencers, under whose patronage the nave and choir were almost reconstructed. The last Lord De Spencer having died without issue in 1414, the abbey then passed to the Beauchamps, and thence to the great King-maker. On his death Edward IV. confiscated the whole of his estates, but in the division of them between Warwick's two daughters, the Tewkesbury possessions went to Isabel, the wife of the Duke of Clarence. On the death of the ill-starred Duke, the abbey with the rest of his possessions was appropriated by the Crown. In 1547 the lordship of Tewkesbury was granted to Lord Seymour of Sudeley. On Seymour's attainder, the estates again reverted to the Crown, but in 1609 James I. sold the manor and borough of Tewkesbury to the Corporation, but reserved to the Crown the right of patronage of the church.

SILICATE STONE AND EMERY WHEELS.

THE members and associates of the Society of Engineers visited, on Tuesday, the works of Messrs. A. H. Bateman and Co., in Pelton-road, East Greenwich, in order to inspect the processes by which silicate stone and emery wheels are manufactured, and the practical application of emery by means of machinery in motion.

The visitors were received by Mr. Arthur H. Bateman, who conducted them over the works, giving, in the course of a five hours' peripatetic lecture, very full and interesting details of the several processes seen in operation. Both of these are developments of the inventions of Mr. Frederick Ransome, which were brought out, as Mr. Bateman remarked, some years before their time —before the manufactures were fully perfected and the initial defects remedied—and thus they were not then appreciated by the public.

The silicate stone, as was seen by specimens, is formed by several chemical processes, which have as their aim the combination of particles of sand with silicate of soda (dissolved flints). The earliest of these consisted in beating these up together, and after thorough mixing, pressing into moulds, and hardening by baking. The objection to this is that common to all processes where heat is employed for induration—that the substance is liable to warping and distortion. A later and great improvement consisted in substituting for the baking process saturation of the mixed ingredients with chloride of calcium. This changes the soluble silicate of soda into an insoluble silicate of lime, and by this mode of manufacture, known as the "calcium" process, a very large quantity of building stone has been produced. A third and more recent method; called the "Apœnine" process, does away with the saturation with chloride of calcium, and substitutes for it an admixture of certain chemicals with the sand and silica. These render the resultant material very hard, stronger, it is asserted, than almost any natural stone, except granite; but the material is intractable, and can only be treated in hard and coarse fashion. The product of the calcium process, on the other hand, hardens very slowly, and never attains the same consistency as the Apœnine; it is, however, of much finer grain, can be accurately cast in moulds to pattern, can be "touched up" during manufacture, and is susceptible of much more ornamental finish. Both the Apœnine and calcium processes are employed at the present time.

The Apœnine stone is thus fitted for positions where mere strength is required; a mile and a-half of balustrading was used by the Mersey Docks Board at Liverpool for walling and piers, and the entrance steps of the Reform Club in Pall Mall were laid in this material eight or nine years ago, and are still in wear. The product, by whatever process manufactured, is a true sandstone, formed in a few days, instead of an unknown number of thousands of years; while the artificial stone may be presumed to have a greater probability of homogeneity of material than the natural. It is practically found that the coarser qualities of sand suit both processes better than the finer ones. Amongst the specimens in the yard was a monolith of Apœnine over 7ft. high, with good arrises and accurate faces. Upon it was placed an elaborately-ornamented cap, produced by the calcium process, with sharply-defined volutes, rolls, and mouldings, thus exhibiting at a glance the differing uses and qualities of the two products. Several members remarked upon the minute cracks and local changes in colour in the Apœnine stone; these Mr. Bateman admitted were defects which had never yet been obviated. The cracks, or "spider-legs," he showed were only skin deep; the patches of slightly darker colour on the stone were probably due to some slight alteration in the chemical combination of constituents. The interior of the stone was not so hard under either process as the face, but it gradually indurated.

In the workshops the calcium process was seen in all stages, as used for the manufacture of about 1,500ft. of coping, with ornamental panels and lamp pedestals to be placed on the sea front at Margate; the contract is being executed from the designs of Mr. Albert Latham, C.E., surveyor of that borough. In one shed the raw materials, tanks of chloride of calcium, heaps of sifted sand, and smaller quantities of Portland cement were seen. In another shed the operation of making a literal "flint soup" was watched. A vessel containing a solution of soda was kept at a temperature of 80° Farenheit, and into this well-cleansed flints were gradually dropped to be digested—first into shapeless crumbling white masses, ultimately being blown by steam-jet into another tank, as a gelatinous almost clear substance, much resembling partially-melted glue. This silicate of soda is then reduced by evaporation in an open tank, heated by steam coils, to the exact specific gravity required—about 1·710. In a series of beautiful experiments performed by a skilled workman, Mr. Bateman showed how every sample was tested again and again, till brought to the precise strength and weight. At 60° F. 1,000 grains of sulphuric acid, of definite strength, and 100 grains of soda exactly neutralise each other, and restore the litmus from pink to blue. This having been demonstrated, an unknown strength of solution was next taken from the evaporating tank and poured, drop by drop, from a graduated measure into a vessel containing litmus and 1,000 grains of sulphuric acid; when the neutralising point was reached the contents of the vessel rapidly changed from a pale pink to a full blue, and the quantity left in the measure was read off, showing the amount required to effect the change. In this case it was almost correct. The strength of soda required in the silicate solution is about 36 per cent.

In another building the making of a "batch of stone" by this calcium process was seen. All the materials, the aggregate of sifted sand, a small quantity of chalk, and the semi-fluid solution of silicate of soda having been weighed to ensure use in exact proportion, were thrown into a rotatory and grinding mill. After a few minutes' churning the various substances formed themselves into lumps of clayey consistency—coagulated, in fact. As in the making of Portland cement, the period of grinding has to be carefully regulated; if it is unduly prolonged the mixture becomes soft, and in time slushy. The material, which looked like so much moist sugar, was carefully kneaded by hand into large wooden moulds, built up in small pieces, and slightly oiled on the faces to prevent adhesion. The coping seen in manufacture is cast hollow, and has bold rolls and mouldings on the face; double keys for dowelling are provided in the sides of every stone. In another workshop was seen more elaborate work in the form of moulds, showing the matrices of the arms of Margate, with supporters and device, built up of very small pieces. Into these the material was carefully kneaded. When the long course of coping first seen was finished, a slate table was laid upon it, the whole clamped together by irons, and lifted by a crane reversed in mid air and set upon a truck running on rails. The packing and moulds were cautiously removed from the sides and top, slight repairs to face executed, and the stone was then taken to another building, where it was stated a solution of chloride of calcium would be sucked through the pores of the material by means of an air-pump, and the stone would be allowed to weather. The slabs for Margate seen in process of manufacture and seasoning, were throughout of a light tint, becoming like natural sandstone, darker where saturated by rain; but Mr. Bateman explained that a variety of hues could be obtained by the use of oxides.

In answer to inquiries, he stated that the cost of the silicate stone was too great to compete with natural stone in plain masonry, but it was, he urged, more economical for carved work; the copings were cast hollow to reduce not only bulk of material, but also expense of carriage. They were intended to be dowelled to one another and set in cement. Any accidental defect in a surface could be remedied, and ornament could be undercut, altered, and pieces applied after the material had left the matrix for saturation without the possibility of detection in the finished stone. He claimed for it the advantage over terra-cotta as a decorative material, that whereas the latter might warp in the kiln, silicated stone remained just as it left the hand of the modeller, induration being effected by a chemical change in the component parts instead of by fire. Pateræ, decorated with Gothic diaper ornament, and as shallow as $\frac{3}{8}$in. in the bed, were exhibited as an illustration of one use of the material.

Concurrently with the inspection of the making of artificial stone, the visitors saw each stage of the somewhat analogous process of forming emery-wheels. Emery is a crystalline rock, consisting of about 86 parts of alumina, with 4 parts of oxide of iron and 3 of silica, and varies in colour from dark grey to black. The property which gives it value is its tendency to break with a rough fracture, no matter how finely it may be separated. Although it has for centuries been used by Turkish and Indian lapidaries for cutting and polishing gems, the history of its European application for grinding purposes dates back less than 40 years, and it has been practically brought into use by Messrs. Bateman and a few other makers. That the cutting properties of the material may be utilised, it is necessary to crush the rock and recombine the sharp fragments by some cementing material. This binder in Messrs. Bateman's process is the insoluble silicate of lime, and Mr. Bateman claimed that it had the great advantage of wearing cleanly, and without objectionable smell.

The whole process of manufacture, which is a modification of the calcium process, was seen and explained. The crushed emery, stored in bins for mixing in various proportions, having been examined, it was mixed with highly-burnt Portland cement and silicate of soda, punned by hand into circular iron moulds. It was next subjected to warming over gas, a process which occupies several hours, and which causes it to "set" more quickly. Wheels completed by these processes were next trued against cutters containing black diamonds, so as to run accurately, and were set on spindles with white metal grooved bearings, the sides of wheels being protected by washers and iron plates. The finished wheels were finally seen at work in various machines, "skinning" iron and brass, making planed surfaces, cutting teeth in cogwheels and circular saws, and similar work, a very interesting visit closing in the fitting-room for general machinery.

THE WHITE HOUSE, CHELSEA.

THE White House, Cheslsea, was sold on the 18th inst. for £2,700 to Mr. Quilter (son, we believe, of the well-known collector of drawings), being some £400 to £500 under its original cost. It was designed for Mr. Whistler, the well-known painter, by Mr. E. W. Godwin, F.S.A., and, as might have been supposed from the much-talked-of idiosyncrasy of the owner, possessed certain peculiarities of design. It was erected in Tite-street (a name somewhat objected to by the bachelor painters who have had houses built there), on a site belonging to the Metropolitan Board of Works. The drawings had first to be submitted to the Board for their approval, and the design was at once thrown out. Mr. Whistler, however, nothing daunted, ordered the work to be commenced, and only after repeated endeavours to get the design passed would he consent to any modification. Greater elevation was given to portions of the main part, and a few stone dressings were added to render it palatable to the Board, with a mental reservation on Mr. Whistler's part to remove them when he obtained possession. This, however, was never done, nor were the embellishments intended to be carried out by Mr. Boehm, A.R.A., the sculptor, ever executed, the only additions being an inscription in black ink over the principal doorway three days before the sale, and signed with the inevitable butterfly monogram of Mr. Whistler. The plan of the house was somewhat peculiar: the principal sitting-room or studio was placed below the level of the street, to which one descended by a flight of six or eight steps. This was probably suggested by the original level of the ground, which was 3ft. 6in. below the pavement. The principal studio was on the upper floor, to which one ascended by a spiral flight of stairs; an intermediate floor fronting the street had also its spiral staircase. The offices were placed on the same level as the sitting-room or studio, but fronting the street, and subsequent additions were made in the rear. The white brick and stone of the principal front and the blue colour of the doors and window frames suggested the symphony of blue and white, characteristic at once of the peculiar fancies of the owner and the power of designing with simple features possessed by the architect.

THE GRANARIES OF LIVERPOOL.

THE grain warehouses at Liverpool, visited this week by the members of the Iron and Steel Institute, are the largest of the kind in the kingdom. They occupy an area of 11,550 square yards, and contain an aggregate floor space of 57,000 square yards, with storage capacity for over 200,000 quarters of grain; they are provided with hydraulic machinery for discharging and housing grain, &c. The granaries are in three separate blocks. The east block is 650ft. in length; the west is of the same longitudinal dimensions; and the north 185ft. The total length of the three blocks is 1,485ft., with a uniform width of 80ft. The internal plan area, exclusive of the quay space, is 48,918 square yards; or, including the quay floor, $11\frac{3}{4}$ acres. The clear height of the granary from the quay to the stone cornice is 84ft., each block consisting of five stories, exclusive of the machinery floor, which dominates all the others and is partly in the roof of the building. Assuming each floor to be loaded up to its *maximum*, four quarters of grain, or 17cwt. per square yard, the total weight of grain upon the floors is not less than 77,660 tons. The clear aggregate storage area of all the floors, except quay and sill spaces, says an official report of the granaries, by Mr. G. F. Lyster, the engineer of the Mersey Dock Board, is 48,918 square feet, and at four quarters per yard would give a storage capacity for, say, 196,000 quarters of grain. The clear height of the floors is from the quay to the under side of the girder, 15ft. 3in., first story from surface to under side of girder 9ft. 3in., second story to ditto 9ft. 3in., third story to ditto 9ft. 3in., fourth story to ditto 9ft. 3in., fifth story to under side of machinery floor 9ft. 3in. At these gigantic warehouses the visitors saw the principal processes performed by the splendid hydraulic machinery provided by Sir W. Armstrong and Company, including discharging grain in bulk from vessels or small craft direct on to the quay or into the warehouses, hoisting grain in bags or casks from vessels on to the quay, discharging ordinary merchandise direct on to the quay or on to any floor of the warehouses, and loading outward-bound vessels, lifting and lowering sacks, bags, and other merchandise on platforms, elevators, and jiggers, to or from any floor, elevating, screening, weighing and distributing grain in bulk, and conveying it to and from all parts of the warehouses and outwards for delivery into ships and waggons.

FIREPROOF LIBRARIES.

THE subject of "Fires in Libraries" formed the subject of a paper written by Mr. Cornelius Walford, and read in his absence by one of the secretaries at the annual meeting of the Library Association, at Manchester, on Wednesday. He traced the subject historically from the burning of the library at Alexandria, B.C. 48, to the fire by which the Birmingham Free Library was almost destroyed last year. The most important part of this paper was that in which he dealt practically with the best means of extinguishing fires in libraries. While individual books were difficult to burn, when taken collectively they were very inflammable because of their surroundings. They were often placed in buildings which helped to destroy them. He gave many suggestions that ought to be followed in planning a library building, and said an absolutely fireproof structure only half-met the case. He called attention to the fact that the woodwork of the library, and even the books themselves, might be made incombustible by chemical appliances. Mr. Cross said he had studied the subject of fireproof buildings, and had come to the conclusion that they were the worst possible buildings for a library. It was a risk that no insurance company would like. Nothing was more liable to destruction than so-called fireproof buildings. They consisted of iron rafters, a vast quantity of bricks, mortar, &c., and at the slightest approach of heat they crumbled away. It was well-known how soon a fireproof building went when attacked by fire. There was always something near it to burn. He thought it was best to keep to the wooden fittings. They could be chemically treated, and rendered fireproof. Mr. Brougham (Leith) agreed in substance with the previous speaker. He did not believe in fireproof buildings. Mr. Cross was correct in saying that when fire attacked a fireproof building the whole thing gave way. Mr. Lomax (Brighton) said they did not want to be instructed in building fireproof libraries, but were to consider the best means of preventing fires. He thought they ventilated their libraries too much—so much so, indeed, that they turned them into blast furnaces. Another danger was water, and a thing to be noticed was the absence of all discipline at fires.

ST. MARY-LE-STRAND.

THE slack season in town, writes Mr. J. P. Seddon in the *Times*, is being utilised by sundry vestries and churchwardens in a manner in which zeal is not always tempered with discretion, and the vigilant eyes of the Society for the Protection of Ancient Buildings are directed abroad, less usefully than they might be at home, in endeavouring to thwart the operations of architects in the provinces (as at Southwell Minster), and leaving builders to work their destructive will upon the monuments of the metropolis. A fell example of such is in full operation at the beautiful church of St. Mary-le-strand. That masterpiece of the architect Gibbs is being denuded before the very eyes of the occupants of that even now crowded thoroughfare of its most striking and characteristic ornamention.

Already two tiers of its exquisite steeple have been stripped of the vases on their angles, which gave great life to its skyline and refinement to the design. By comparison with photographs showing what it was but a few days since, a glance will make evident to what a condition of baldness it has been brought. The charming balustraded parapet that surmounts the body of the church had been condemned in like manner, and its total removal contemplated; but the destruction of that feature has been happily stayed for a season. These accessories to the structure have become decayed and been thought dangerous, and the church voted by its authorities to look quite as well without them. Surely, however, the public will not submit tamely to so monstrous a mutilation of one of the most lovely buildings in London. The restitution of the removed features, copied with exactness from the originals, before they are broken up for mending the roads, should be insisted upon; for the fragments now lying in the churchyard are of most exquisite design.

As the scaffolding is being taken down in haste, damaging with dangling poles the cornices of the church—in their turn, perhaps, to be voted dilapidated and dispensable—there is obviously no intention of replacing them. Pray, sir, raise your powerful voice to arrest this Vandalism lest the steeples of Wren and his pupils, the glory of our city, be successively stripped of all that gives them their vigour and grace as a holiday occupation for churchwardens and surveyors.

Stone, like other materials, must decay, but it is not too much to ask that generations who have inherited these monuments should repair them as becomes needed, replacing, stone for stone, those that fall into decay, and so hand them down unmutilated to posterity.

◆

Plans prepared by Messrs. Hetherington and Oliver, of Carlisle, have been approved for building a school-chapel at Carnforth for the Congregationalists. An eligible site has been secured, and provision is made for the erection of a larger chapel hereafter to seat 600 persons.

INTERNATIONAL WATER SUPPLY CONGRESS.

A CONGRESS of the International Association for the Promotion of Means for Improving the Supplies of Drinking-Water to Populations was formally opened at Amsterdam on the 11th inst. Upwards of forty members took part in the proceedings, including representatives from France, Germany, England, Holland, Belgium, Portugal, and Java. Mr. Edwin Chadwick presided, and Dr. Mouat read, in French, the presidential address, which stated the general conclusions at which sanitary science has arrived in England for the extension of improved supplies of potable water. The first is the improvement of machinery and methods of distribution by connecting the house-service pipes with the street mains as parts of one system, and that a public one, responsible for the removal of all conditions of stagnation, as in cisterns, by which the best supplies are made bad, and bad supplies are made worse. The next is that the service of carrying in pure potable water shall be united with the duty of immediately carrying away fouled water, and preventing stagnation by removal through self-cleansing drains and sewers, and applying it direct to the land. The third regards the sources of supply, abandoning as soon as possible river sources containing, besides the sewage of towns, the surface washing of lands, especially highly-manured lands, and substituting by preference supplies from spring sources, or sources derived from primitive rocks or clean surfaces; and, where good natural springs are not within reach, creating artificial ones. On the controversies as to the eligible qualities of water, the results on classes of people under similar conditions were referred to. Thus, in a prison supplied with the sewer-tainted water of the River Thames, cases of typhoid fever were, it was stated, frequent. The sources of supply were changed to spring sources, and fever almost entirely disappeared, and there was a marked advance in the general health. In one prison there was an outbreak of diarrhœa, such as prevailed regularly amongst the outside population. Accidental contamination of the water in the prison cistern with sewage gas was detected. When that was prevented health was restored. In one prison cases of goitre appeared. They were suspected to be due to the water. The water was changed, and cases of goitre ceased. The most important collective test as to the value of pure water supplies are those on board our steamships of war. All are now supplied with water distilled from sea water, duly aërated. As compared with the supplies obtained from the common sources of potable water got from shore, it is considered greatly superior, and is a great sanitary boon. There is no doubt that the superior quality of the water thus supplied to the royal navy is one of the chief factors in contributing to the greater healthiness of the sailors of the royal navy over those employed in the mercantile marine.

TECHNICAL EDUCATION.

THE City and Guilds of London Institute for the Advancement of Technical Education have just issued their Technological Examination Programme for 1880. These examinations are carried out on much the same principle as those of the Science and Art Department in subjects of pure science. They are held through Local Committees in all parts of the kingdom, and facilities are afforded by which any qualified artisan may be examined in the technology of his trade, and may obtain a certificate. The subjects announced for the present year are—(1) Alkali Manufacture; (2) Blowpipe Analysis (Practical); (3) Brewing; (4) Calico Bleaching, Dyeing, and Printing; (5) Carriage Building; (6) Cloth Manufacture; (7) Cotton Manufacture; (8) Electro-Metallurgy; (9) Gas Manufacture; (10) Glass Manufacture; (11) Goldsmiths' and Silversmiths' work; (12) Iron Manufacture; (13) Lace Manufacture; (14) Manufacture of Oils, Colours, and Varnishes; (15) Paper Manufacture; (16) Photography; (17) Pottery and Porcelain; (18) Printing; (19) Silk Manufacture; (20) Silk Dyeing; (21) Steel Manufacture; (22) Sugar Manufacture, &c.; (23) Tanning Leather; (24) Telegraphy; (25) Watchmaking; (26) Wool Dyeing. The Examination is in three Grades:—Honours, Advanced, and Elementary. Grade I. is intended principally for foremen, overlookers, &c.; Grade II. for journeymen; Grade III. for apprentices; but candidates may enter themselves for any grade they choose. Certificates (first and second class) are awarded in each grade. Any person desiring to be examined may present himself, but before he can take a certificate in Technology he will be required to have passed the Science and Art Department Examination in certain specified Science subjects. The object of this is to insure that holders of the Technological certificate shall have, at all events, a rudimentary knowledge of the scientific principles underlying his craft. In order to encourage the formation of classes for instruction in the different subjects, payments are offered to teachers on account of every student they pass in the Technological examination. These payments consist of £2 for each candidate taking a first-class, and £1 for each candidate taking a second-class in any grade. Prizes consisting of money, and medals of silver and bronze are offered in each grade of each subject. The programme gives full instructions as to the formation of classes, methods of obtaining the grant, conditions of examination, &c. It also contains a syllabus for each subject, showing the range of each section of the examination. Copies can be obtained gratis on application to the Secretary of the Institute, Mercer's Hall, E.C.

AN ANCIENT ENGLISH CHURCH IN CYPRUS.

THE Bishop of Gibraltar has just published a pastoral letter, in which he makes an appeal on behalf of the restoration for use of the ancient Church of St. Nicholas-of-the-English, at Nikosia, in the island of Cyprus. He says it is a fine old church, and that when he visited the island it was in the hands of a Turk, who used it partly as a granary, and partly as a stable. The bishop decided to endeavour to secure the desecrated edifice for alteration into an English house of prayer, and the Society for the Propagation of the Gospel in Foreign Parts has obtained a perpetual lease of the building and ground, absolute purchase being illegal. The writer traces the history of the church just recovered, reminding his readers that when Acre was finally compelled in 1219 to be surrendered by the Crusaders to the Turks, some of the forces of the Cross found a home in Cyprus, and among them the Order of St. Thomas of Acre, a small semi-religious knightly order of Englishmen. This order had been founded by the sister and brother-in-law of Thomas à Becket, and possessed a hospital, built on the site of the house Becket was born in, and a church on the spot where is now the chapel of the Mercers' Company. During the Crusades the Order settled at Acre, and devoted themselves to the office of burying the dead, and at the siege of Acre the Order is represented as leading the 5,000 soldiers Edmund I. had sent to Palestine. Such members of the Order as survived the siege settled at Nikosia, where they possessed a church known as "St. Nicholas-of-the-English." Various religious ceremonies are recorded as having taken place at this church. It seems to have been the place in which the masters, priors, and custodes of the Order were appointed to their places. Whether the desecrated church which he saw in Nikosia was originally built by funds from London, and is the very edifice in which Englishmen worshipped 500 or 600 years ago, the bishop admits he has not been able to discover; at any rate, the church bears the same name, and the style is Transitional. To fit it for use as a place of worship, no actual building will be required, though some walls that the Turks have erected and the *débris* which has accumulated on the floor to the extent of 3ft. must be removed; the internal surface of the walls must be thoroughly cleansed, scraped, and pointed; suitable furniture must be provided, and some mud huts contiguous to the church must be pulled down. The sum required to do the work effectively is estimated at £2,000.

HEATING BY RADIATION.

IT is noteworthy that while many at home are predicting the downfall of the open fireplace—the Englishman's cherished comfort—and the substitution of close fires, our American cousins, who have had a fair experience of the merits of the latter system, are not altogether convinced of its advantages.

"That the earth should be surrounded by and be driven through a space of intense cold, and that all the sensation we term heat should come through millions of miles of this intense cold before reaching us, ought," says Mr. Lewis W. Leeds, in the *American Plumber and Sanitary Engineer*, "to give us some hints of the natural conditions under which our existence becomes possible. The whole warmth upon the surface of the earth is received by radiation from the sun. The air is warmed by coming in contact with the warmed earth. The air warmed by this contact with the heated earth rises, and the colder air from above tumbles down to take its place. This forms the great natural ventilation or circulation of air over the surface of the earth which sustains all life. We should endeavour to imitate this in our artificial arrangements for heating buildings. As all solid objects at the surface of the earth are warmer, on the average, than the air, our bodies are made to conform to that condition. They are, therefore, much better sustained while inhaling the natural cold air than when inhaling warmed air.

"The idea of attempting to warm our buildings by overheating the fresh air supply has been a most unfortunate one for the American people. It is a very unnatural one, and it is impossible to make our systems conform to it. It has been adhered to and pushed forward with characteristic American perseverance, but the third and fourth generations submitted to such premature stewing seem no fonder of it than their great-grandfathers. They only become less in stature and weaker in mind, and if continuously fed on such air would probably act much like the Irishman's horses, just as they had become able to endure such worthless straw-like stuff, they would die.

"For healthfulness the open fire most nearly imitates the radiant heat of the sun. The air, warmed by immediate contact with the fire, is carried up the chimney. It is not thrown into the room to be breathed. As the radiation from the fire passes through the pure air without warming that air, it follows that the rays of heat are thrown across the room to the opposite walls and partially warms thems, and warms any persons in the immediate range of that radiation. It follows, therefore, that the persons in a room may be comfortably warmed by the direct rays of an open fire or other hot body while being surrounded with and inhaling cold invigorating air. This is much more wholesome and more agreeable to our system, because more natural, than when surrounded by that artificial condition produced by all our warm-air contrivances, when the air is hotter than the solid objects in the room. All these air-warming contrivances which we have been introducing so extensively are unnatural and incorrect, and the sooner we abandon them and adopt the natural system of warming by radiation, as is done by the sun, the better it will be for the health, strength, and prosperity of the nation."

THE INDIAN TEMPLE AT AMRITSAR.

THE golden temple at Amritsar, called Harimandir, or sometimes Durbar Sahib, is said by a writer in the *Contemporary Review*, to rank next to the Taj at Agra as one of the most striking sights of India. To form an idea of the unique spectacle presented by this sacred locality one must picture to one's self a large square sheet of water, bordered by a marble pavement, in the centre of a picturesque Indian town. Around the margin of this artificial lake are clustered numerous fine mansions, most of them once the property of Sikh chiefs, who assembled here every year and spent vast sums on the endowment of the central shrine. One of the houses is now occupied by Sirdar Mangal Sinh Ramgharia, a well-known and much-esteemed member of the Sikh community. It has two lofty towers, from one of which the writer enjoyed a grand panoramic view of the lake and its vicinity—one of those rare sights seen at intervals during life which fix themselves indelibly on the memory. In the centre of the water rises the beautiful temple with its gilded dome and cupolas, approached by a marble causeway, and quite unlike any other place of worship to be seen throughout India. In structure and appearance it is a kind of compromise between a Hindoo temple and a Mohammedan mosque, reminding one of the attempted compromise between Hindooism and Islam, which was once a favourite idea with both Kabir and Nanak. In point of mere size the shrine is not imposing, but its proportions strike one as nearly perfect. All the lower part is of marble, inlaid, like the Taj, with precious stones, and here and there overlaid with gold and silver. The principal entrance facing the causeway looks towards the north. The interior is even more gorgeous than the exterior. On the ground floor is a well proportioned vaulted hall, its richly gilded ceiling ornamented with an infinite number of small mirrors, and its walls decorated with inlaid work of various designs, flowers, birds, and elephants. Four short passages, entered by carved silver doors, one on each of its four sides, lead to this vaulted chamber, giving it a shape not unlike that of a Greek cross. All around on the outside is a narrow corridor. In the interior, opposite the principal entrance, sits the presiding Guru—his legs folded under him on the bare ground—with the open Granth before him. He is attended by other officials of the temple, who assist him in chanting the sacred texts. And be it observed, that although the temple is conspicuously free from images and is dedicated to the one Supreme Being (under his name Hari), a visible representation of the invisible God is believed to be present in the sacred book. The Granth is, in fact, the real divinity of the shrine, and is treated as if it had a veritable personal existence. Every morning it is dressed out in costly brocade, and reverently placed on a low throne under a jewelled canopy, said to have been constructed by Ranjit Sinh at a cost of 50,000 rupees. All day long chowries are waved over the sacred volume, and every evening it is transported to the second temple on the edge of the lake opposite the causeway, where it is made to repose for the night in a golden bed within a consecrated chamber railed off and protected from all profane invasion by bolts and bars.

THE PERVIOUS ROCKS AND WATER-SUPPLY.

THE value for water supply purposes of a correct mapping out of the permeable and impermeable strata, and the river basins of England and Wales, is generally admitted. We have before urged as a most necessary preliminary to any commission appointed to inquire into the subject of water supply, that the underground drainage should be carefully studied and the districts defined. Mr. C. E. De Rance, F.G.S., C.E., lately published some further investigations upon this subject, and showed that an important watershed crosses England diagonally from north-east to south-west separating the basins of the Severn, Trent, &c., on one side, from those of the east coast streams, Thames, Witham and Ouse on the other. This line is said to separate nearly all the strata up to the top of the Trias from the Lias upwards. Mr. Rance shows that this diagonal watershed is mainly situated in the oolitic strata and corresponds nearly with the north-west boundary line of the counties of Lincoln, Rutland, Northampton, Oxford, Bucks, Wilts, and Dorset. Referring to the Thames basin, Mr. Rance observes that assuming that only one-third is pervious, and only 5in. of rain annually be absorbed, a daily yield will accrue of 325 millions of gallons, or a supply for six and a half million people. That a large yield is obtainable is proved by the volume of the springs in the Thames head. The data given to prove the above yield are the following:—The oolites of the Thames basin occupy 940 square miles, those of the Witham and Ouse 3,701 miles, those lying west of diagonal watershed 236 miles, or a total area of 4,880 miles, the whole underground drainage of which gravitates to the Thames basin. The pervious cretaceous rocks occupy in the Thames and east coast district an area of 4,000 miles, and receive annually a rainfall of not less than 5 inches, or a daily supply of 800 million gallons. Taking the oolite supply, the volume of water yielded by the underground sources of the Thames and east coast river basins amount to 1,125 million gallons—a supply equal to the wants of 22 millions. Again, from the sandstones which crop over a large area in the Lancashire and Cheshire triassic plain, a large yield of water is declared to be obtainable—four times the actual demand. These figures are sufficient to show what may be expected by an intelligent utilisation of our great watersheds. To do this, it is first of all necessary to map out the groups of river-basins, and the areas of the permeable and impermeable strata in each of them. The special character of each district in its geological formation must be thoroughly examined, with reference more particularly to the proportion of water-shed of the basin, and the absorbent or non-absorbent condition of the rocks. In permeable soils the resources of springs may be taken advantage of, but in impervious strata, the water will either have to be procured by deep wells or led by pipes. A thorough knowledge of the distribution of rainfall in the various districts is almost as necessary as an acquaintance with the geological formations, for upon our knowledge of the amount of minimum rainfall must be based the quantity to be expected. It is not a fair criterion to take average of years, as is generally done, as that quantity only presents us with an amount that seldom can be depended upon; nor must we trust too implicitly upon the artesian well as a never-failing source of supply.

PILE-SINKING BY THE WATER-JET.

THE Berlin Water Company, according to the *Zeitschrift des Architekten- und Ingenieur-Vereins zu Hannover*, having objected that the driving of some bridge piles would cause injury to their main, which ran close to the proposed site, it was determined to make use of a jet of water. A tube, 0·89in. in diameter, tapered at the mouth to 0·78in., was led to the point of the pile, and a Californian vertical hand-pump used to force the water down.

As soon as the water was applied, the pile began to sink, and in five minutes had descended to 29½in., when blows from a 770lb. monkey failed to drive it farther. A force-pump, driven by a 10 horse-power engine, and throwing 880 gallons of water a minute, was now used, and, by gradually loading the pile to the extent of 3,410lb., it sank 5ft., the gauge showing a water pressure of 11 atmospheres. The first tube was then replaced by one of 2·5in. diameter, tapered toward the mouth as before, and the pressure was reduced to 2½ atmospheres. The jet was now far stronger than at first, and in a few minutes the pile sank 9ft. 9in., being loaded to 3,300lb.

It was, therefore, determined to try the town pressure (4 atmospheres) alone. This was very successful. In about five minutes the pile had sunk about 11½ft. without loading; and in ten minutes more it had sunk another 4½ft.; in one hour, being gently rammed, it reached a total depth of 22½ft. A 2in. untapered tube was then adopted, and shoes discarded for the piles, which were rotated during their descent. This was easily accomplished, as was also the lifting of the pile while the water was flowing. From the tabulated results it appears that ceramic and peat strata are not good for this kind of pile-driving, but that sand and gravel admit of its use with great advantages, the cost being about one-third that of ramming.

THE ALCAZAR OF SEVILLE.

OPPOSITE the Cathedral, at the corner of which stands the Giralda, writes a correspondent of the *American Architect and Building News*, is the royal palace of Alcazar. The only façade of the Alcazar which has any architectural interest is reached after traversing several courts, and the visitor to the Paris Exhibition will at once recognise it as having supplied the *motif* of the Spanish façade there. It is light, elegant, and of nearly the same style as the Alhambra. The dainty little colonnettes of the galleries in the second story are of fine marble, and the walls are covered with gold and colours, and yet the general effect is not glaring. The Duc de Montpensier gave 50,000 dols. for the restoration of this façade, which, however, has been clumsily and carelessly done. The entrance to the great central court—Patio de las Doncellas—has lately been changed and complicated, and now one suddenly stumbles into it. Around it fifty-two slender marble columns, chiefly arranged in pairs, support the second story of the gallery. This upper story is Ionic, and appears absurd and paltry above the elegant arcades below, which are beautiful examples of the fourteenth century, and rival those of the Alhambra. The doors, which give access to the apartments opening from the court, are better preserved than those of the Alhambra, and are beautiful specimens of the inlaid work of the period. The celebrated Hall of the Ambassadors was so restored in 1569 that it is no longer a pure example of the best Moorish work, but it still retains its superb wooden dome with inlaid patterns, and the walls covered with stucco tracery. The azulejos, or tiles, in the dado are of the best period; but a restoration of the sixteenth century added Rococo balconies on each side and a frieze of portrait heads, which must be very valuable to the historian to reconcile the artist to the mutilation of this splendid hall. We must not complain, however, for our generation is responsible for a restoration of the colour in the wall patterns, which is still more crude and false in tone than the more recent efforts at the Alhambra. It is a relief to pass from this glare of paint and gilding into the lovely little Patio de las Munecas, whose dainty proportions and elaborate lace-work of delicate reliefs make it one of the most beautiful Moorish examples. Its present creamy whitewash is certainly more agreeable than anything short of the most perfect polychrome. It is very small, and the three stories of galleries surrounding it remind us that our hideous wells for light in city buildings have been and may be made a beautiful feature in themselves. After this there is a series of handsome halls, all of historical interest, unfortunately proved by the restorations introduced by different Spanish sovereigns who have lived there since they expelled the Moorish princes, down to Queen Isabella of our day. Unlike the Alhambra, the second story offers an important suite of rooms. Among them the most interesting is the tiny sixteenth century chapel, only 15ft. by 12ft. It is covered with cinque-cento tiles, and is counted the finest specimen of Christian decoration in Spain. Very fine are also the Arabian tiles in a hall near the garden, now used as a stable. The gardens themselves are laid out like those of Italy, with their faults and beauties. Quaint, pretty walks, ponds and water-works, tasteless grottoes and poor architecture; but criticism is disarmed by the brilliant sunlight and shadow which in this southern land is the leading decorative *motif;* and the works of men, good and bad, are alike but playthings for its powerful display. A word to those who wish to make studies in the Alcazar. Unlike the Alhambra, permission is with difficulty obtained to work here, and can only be had on applying to the Intendant of the Palace at Madrid, and so the traveller, if coming from the north, will do well to apply when at Madrid.

CHIPS.

Builders should be careful in exposing lime in unsheltered situations. On Wednesday morning a fire was caused by the rain slaking lime at the premises of J. H. Weitzel, builder, 1A, England-place, West Ferry-row, Millwall, and the workshop was damaged.

The new offices of the Swinton local board are now completed. The structure is three stories high, and is built of brick, with stone facings. The public portion of the building consists of a commodious office for the surveyor, a lofty, well-ventilated, and well-lighted board-room, a committee-room adjoining, fitted up with lavatory, and a store-room. The rest of the building is devoted to the residence of the surveyor, and comprises two sitting-rooms, two good kitchens, and three bedrooms. The contractor is Mr. John Middleton. The whole of the work has been carried out under the superintendence of the surveyor, Mr. J. C. Haller, who designed the plans.

In our notice, p. 356 last week, of the "Princess Alice" memorial cross, now being executed for erection in Woolwich churchyard, the name of the sculptor was, by error, printed Mr. *East*; it should be Mr. *Earp*.

A rumour has been current in professional circles during the present week that Mr. T. Graham Jackson, M.A., had met with a serious accident while sketching. On inquiry at Devereux Chambers, we were glad to hear that the report had been exaggerated, and that Mr. Jackson is expected to return to his duties in about a week's time.

A new board school in Church-street, Kennington, the 204th built by the London School Board, has been opened. The total cost per head of the school amounts to £9 17s. 10d. The cost of the site was £4,651, and that of the building £7,667. It will accommodate 802 children—namely, 240 boys, 240 girls, and 322 infants.

Llansannor church was reopened on Wednesday week, after restoration of the chancel and the erection of new walls round the churchyard. The work has been carried out under the supervision of the diocesan surveyor.

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ILLUSTRATIONS.

LEADENHALL HOUSE, LEADENHALL-STREET. — CADOGAN-TERRACE, CHELSEA.—CHURCH OF ST. SAVIOUR, WOOLCOT PARK.—ST. JOHN'S HOSPITAL, RYE.—RESIDENCE, CHEYNE-WALK, CHELSEA.

OUR LITHOGRAPHIC ILLUSTRATIONS.

LEADENHALL HOUSE, LEADENHALL-STREET.

THIS block of business premises in Leadenhall street (Leadenhall House, Nos. 99 to 103), has been erected from the designs and under the supervision of Mr. J. L. Holmes, architect, of 101, Leadenhall-street, and Queen Victoria-street. The building presents an important frontage of about 70ft. to the north side of Leadenhall-street, immediately opposite Billiter-street, and extends for a depth of nearly 180ft. to Bury-street and Brown's-buildings. The façade, which is in the Renaissance style, is remarkable for the large quantity of red polished granite which is used in its construction, and for the skilful manner in which the tints have been blended. The ground story consists of eight Doric granite monolithic columns and pilasters supporting an entablature, the fascia of which is also of granite. The cornice maintains an unbroken line save in the centre, where there is a segmental pediment with panelled soffit over the main entrance, which latter is formed by a semicircular archway with granite architraves, the doorway being deeply recessed and surrounded with panelled granite jambs. The tympanum of the pediment and the spandrels over the archivolt are filled in with allegorical statuary. The first floor is entirely of polished granite in jointed courses. The centre portion is kept forward, whilst the wings are set back on either side, and flanked at each end on the cornice with a handsome enriched stone vase. The windows in this story are formed by flat arches of granite, with carved stone keys, the centre one being relieved by a head of Mercury. The second and third floors comprise the main order, which is Corinthian. The shafts, twelve in number, are of granite, standing out in bold relief against a general face of granite, and are placed upon pedestals with granite dies. The entablature is broken around the columns to give a greater appearance of richness; the two columns forming the centre portion stand out clear of the remainder, and are backed by square pilasters on either side of a semi-circular bay, which is maintained during the two stories. The windows of the second floor have stone lintels and pediments, with spread eagles, Cupids, and foliage sculptured in high relief in the tympana. The circular bay at this level has a carved cornice and fascia, with granite lintel, whilst the space over is carved with festoons and wreaths. The heads of the third-floor windows are of granite, with bold centre bosses of the same material. The circular bay on each floor is divided into three windows by small granite shafts, with finely-chased bronze caps, vases, and annulets. At the top of the third-floor the granite work ceases, the building above the main cornice being carried up entirely in stone. The fourth floor is relieved with quarter pilasters having festoons of flowers carved in the faces, and having carved trusses at top and bottom. The windows on this floor are segmental-headed with carved key-stones and spandrel panels on either side. The centre bay here assumes a semi-octagon form in lieu of the circular one below, and has a head carved upon the key-stone, the flanks being ornamented with a caduceus and a lizard and foliage. The centre is crowned with a semicircular pediment, with carved tympanum and key-stone supporting a large vase. The building internally is divided into five blocks, separated above the ground story by open areas running parallel with Leadenhall-street, the centre corridor being carried across these areas on each floor. The contractors are Messrs. Merritt and Ashby, of London-wall, the works being superintended by Mr. R. Roe. Mr. H. Kemp is the clerk of the works, and Mr. G. Seagood the contractors' foreman. The external granite has been supplied by Mr. J. MacColla, 11, King-street, Cheapside, who also executed the tile work in the interior, and supplied the stoves and chimney pieces. The sculpture and carving have been executed by Signor Fucigna, of 74, Newman-street, assisted by Mr. Stocks.

CADOGAN-TERRACE HOUSES.

WE have before given various illustrations of mansions being erected on the Cadogan and Hans-place Estate, but they have been of a larger and more expensive character than those shown in our drawing this week. Our readers are probably aware that this estate, comprising about 26 acres, has, within the last two or three years, been converted into a building property under the powers of a special Act of Parliament. It is an extraordinary thing that so large a property in such a situation should have been left so long unbuilt upon. Building, however, having now commenced, is being rapidly carried on, and the estate is now quite worth a visit, as a study from an architectural point of view, as there are some of the best specimens of the work of the greatest architects of the day. Cadogan-terrace is the only frontage on which houses of the class shown in our drawing can be erected on the estate. These houses are being built of red bricks, with stone dressings, by Messrs. Quinn and Co., of Bermondsey, from the designs of Mr. Robert Keirle, F.R.I.B.A., Victoria House, 111, Victoria-street, Westminster. The carving has been executed by Mr. B. de Sziemanowicz.

ST. SAVIOUR'S CHURCH, WOOLCOT PARK.

THE design was selected in limited competition by Mr. Ferrey, to whom the plans were referred. The whole matter is in abeyance at present for want of funds. Mr. J. Bevan, of Bristol, is the architect.

ST. JOHN'S HOSPITAL, RYE, SUSSEX.

WE publish this week an illustration from a measured drawing by Mr. Ward of some old buildings in Mermaid-street, Rye. Some years ago, they were allowed to remain uninhabited, and get into a dilapidated condition, and some of the windows were filled up with plaster; this, however, has now been removed, and the openings filled with lead light. Notwithstanding the time it has stood, and the treatment to which it has been subjected, the whole of the works is in a wonderful state of preservation, all the mouldings being as sharp and clean as when first executed. On the right-hand bracket at eaves of gable over entrance doors, the date, 1576, is carved in figures characteristic of the period. The heads and sills of side of bay windows are not horizontal, and have all the appearance of having been built as shown, all the mouldings properly mitreing, and no sign of shrinkage or sinking being visible. Holloway, in his "History of Rye" (p. 574, date 1847), alluded to this house as being the property of one "Jeake," who describes it as being one of the best houses in the town. He also traces its owners back to 1657, and in another part of his history (p. 598), he gives the following account: "The building, thus called, was the dwelling of Samuel Jeake, the younger, who, in his diary, tells us he received it as his wife's dower on the day of his marriage. It obtained its present name from being used as a hospital during the late war, when great numbers of soldiers were quartered in this town and neighbourhood. On a sort of water tank in the interior part of the house is the following inscription, viz.:

1699
S E
J

evidently signifying Samuel and Elizabeth Jeake, he having married Elizabeth Hartshorn. This is not the date of the foundation of the house, as may be seen in the memoirs of the Jeake family, but only of this part to which the inscription is affixed.

2, CHEYNE-WALK, CHELSEA.

THIS is an illustration of a new front that has been put to an old house. The interior, with the exception of certain repairs, remains intact, and necessarily difficulty was encountered in adapting a new front to the old floor-levels. How far this difficulty has been overcome, the elevation will speak for itself. The materials are red bricks, the bays, projection over same, and all dressings are in gauged work. The pent and roof are covered with tiles. The wall and fence to forecourt are as originally existing. The works have been carried out by Messrs. G. J. Birmingham and Co., builders, 73, Charlotte-street, Portland-place, under the direction of Mr. Edward Vigers, of 38, Parliament-street.

◆

CHIPS.

The foundation-stone of the new school-church of St. Stephen was laid in Springfields, Wolverhampton, on Saturday week. The building will be 80ft. in length, by 27ft. wide; the chancel will be formed by partitioning off a portion of the east end. At the south-west angle is a classroom and vestry, 17ft. by 14ft, All the walls are faced internally and externally with pressed red bricks, relieved by moulded and white brick bands. A bell turret will be placed on the west gable, and the roof will be covered with tiles. Mr. T. H. Fleeming, of Wolverhampton, is the architect, and the work is being carried out by Messrs. G. and F. Higham, builders, of the same town, at a cost of about £1,500.

The opening of the debating-hall of the Union Society at Oxford will take place on Thursday, the 16th prox. The new room will accommodate about 600 persons, and is being built from the designs of Mr. Alfred Waterhouse, A.R.A., by Messrs. Parnell, of Rugby.

A new schoolroom for girls, at Henley-on-Thames, was opened by the First Lord of the Admiralty on Saturday week. It is of brick and flint, and consists of main-room 54ft. by 24ft., class-room, and offices. The cost has been £600.

At the quarterly meeting of the Chichester Diocesan Association, a grant of £70 was made for a new church at Sayers Common, Hurstpierrepoint; and £100 each was voted for parsonage-houses at Hollington, St. John's, and Mark Cross.

Quickened by a fatal street accident, the Brighton Town Council, having considered the subject since 1864, decided on Wednesday week to apply to Parliament to enable them to erect a public abattoir and close the existing slaughterhouses in Brighton. The corporation dustyard, which abuts on a railway siding, was spoken of as the most eligible site.

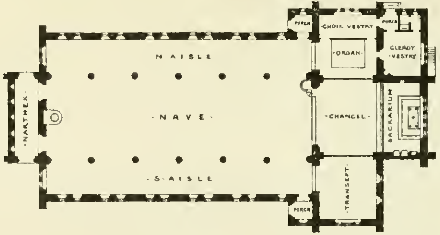
A two-light window in the south aisle of St. John's Church, Walton-on-the-Hill, Liverpool, has just been filled with stained glass. The subjects are figures of St. Paul and St. Stephen, and the work has been designed and executed by Mr. Henry Holiday, of Hampstead.

Mr. George J. Walker, of the firm of Messrs. Walker and Beattie, land surveyors, of Aberdeen, has been appointed Assistant Commissioner for Ireland under the Royal Commission to inquire into the cause of the agricultural depression in that country.

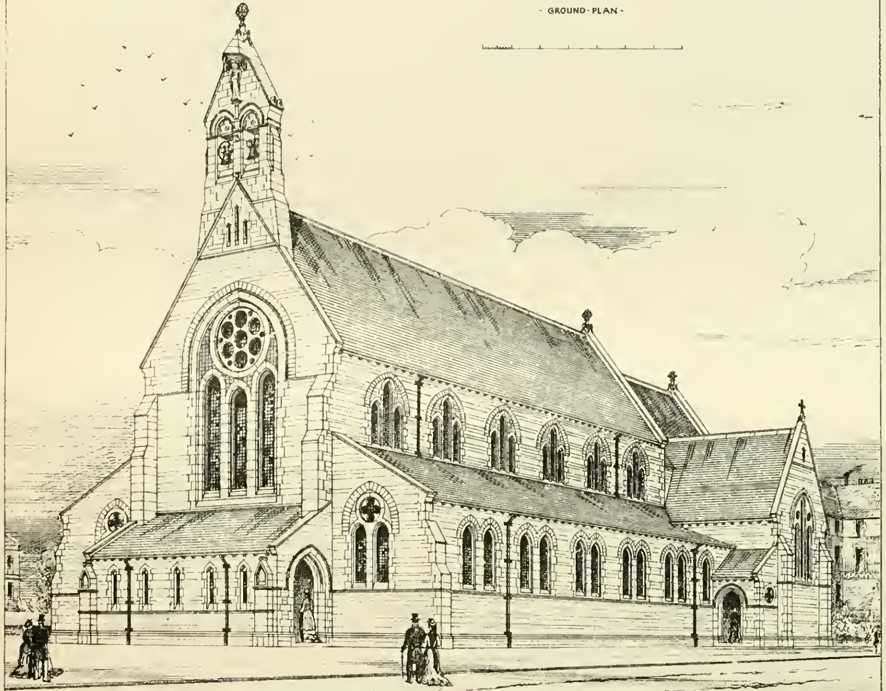
The death is announced of Mr. W. Newall, late principal clerk under Mr. Vulliamy, in the superintending architect's department of the Metropolitan Board of Works.

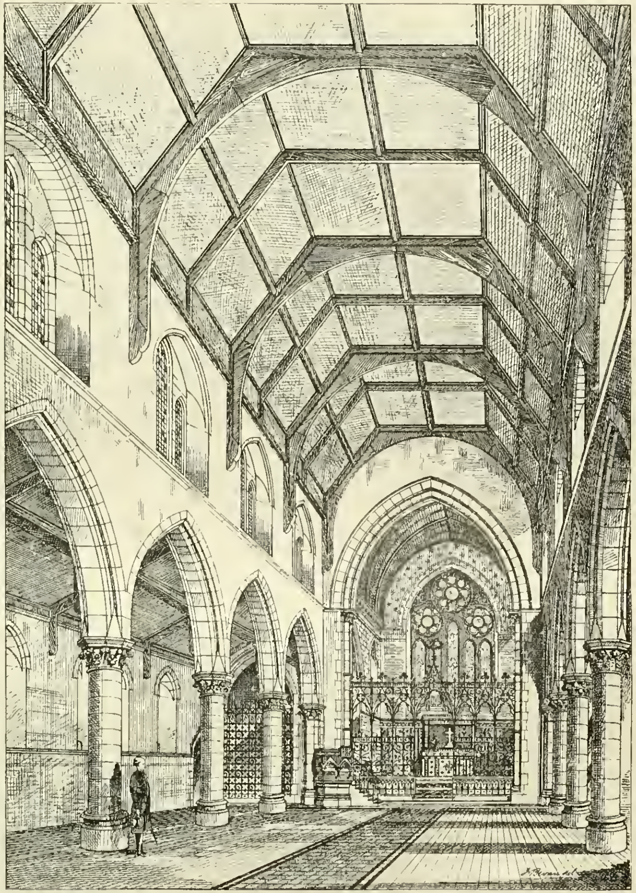
The chancel of Landbeach parish church, Cambs, has been embellished by the insertion of a stained-glass window, commemorating two distinguished former rectors: the Rev. John Cory, B.D., who held the living from 1688 to 1727, and the Rev. Robert Masters, B.D., rector from 1756 to 1797. The arms of the two clergymen are placed in the window, which has been carried out by Mr. Pace, of High-street, Camden Town.

- SOUTH-WEST VIEW -



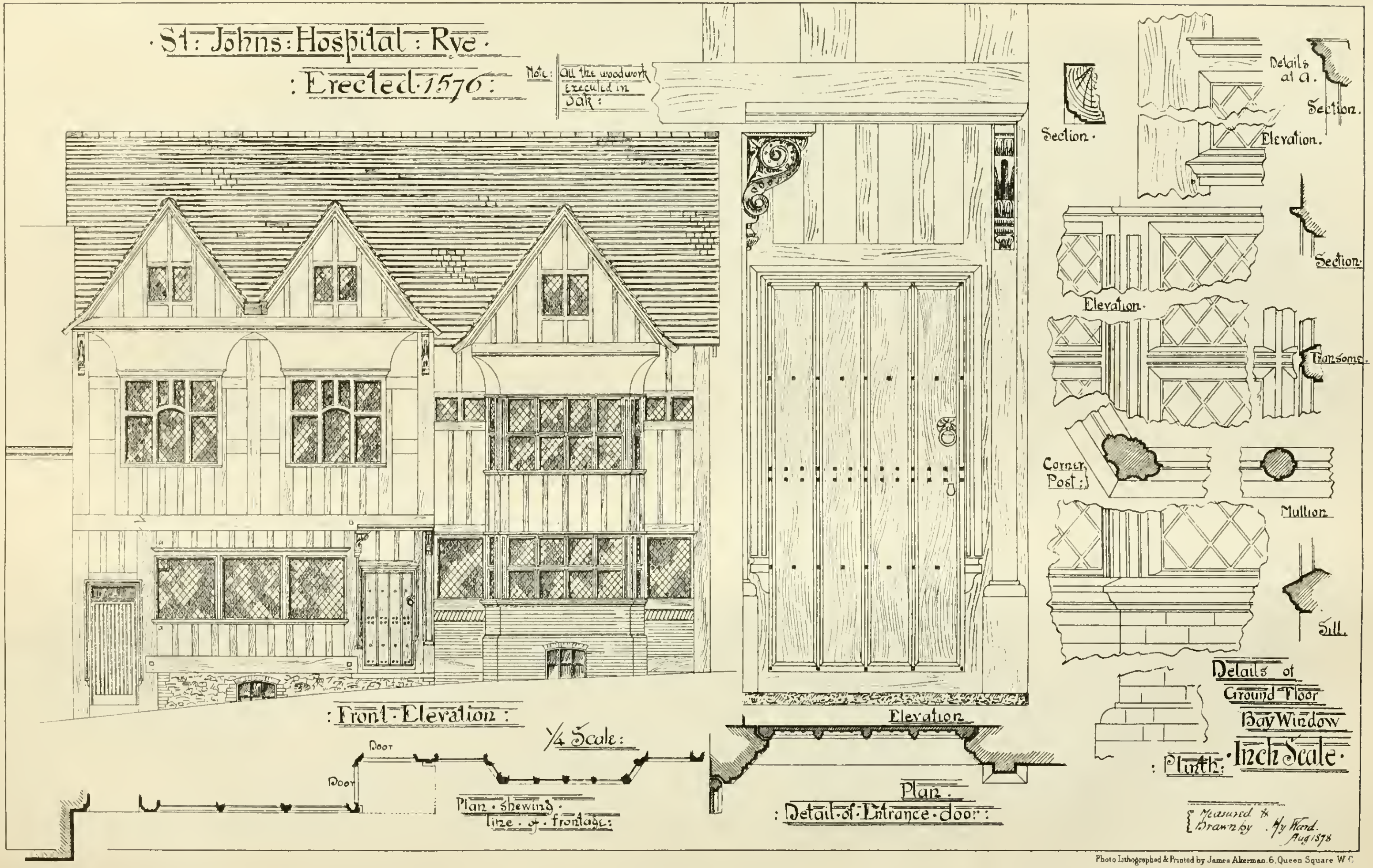
· GROUND · PLAN ·





⊕ PROPOSED · CHURCH · OF · SAINT · SAVIOUR · WOOLCOT · PK ·
· view · of · interior · looking · east · John · Bevan · Archt · Bristol ·

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



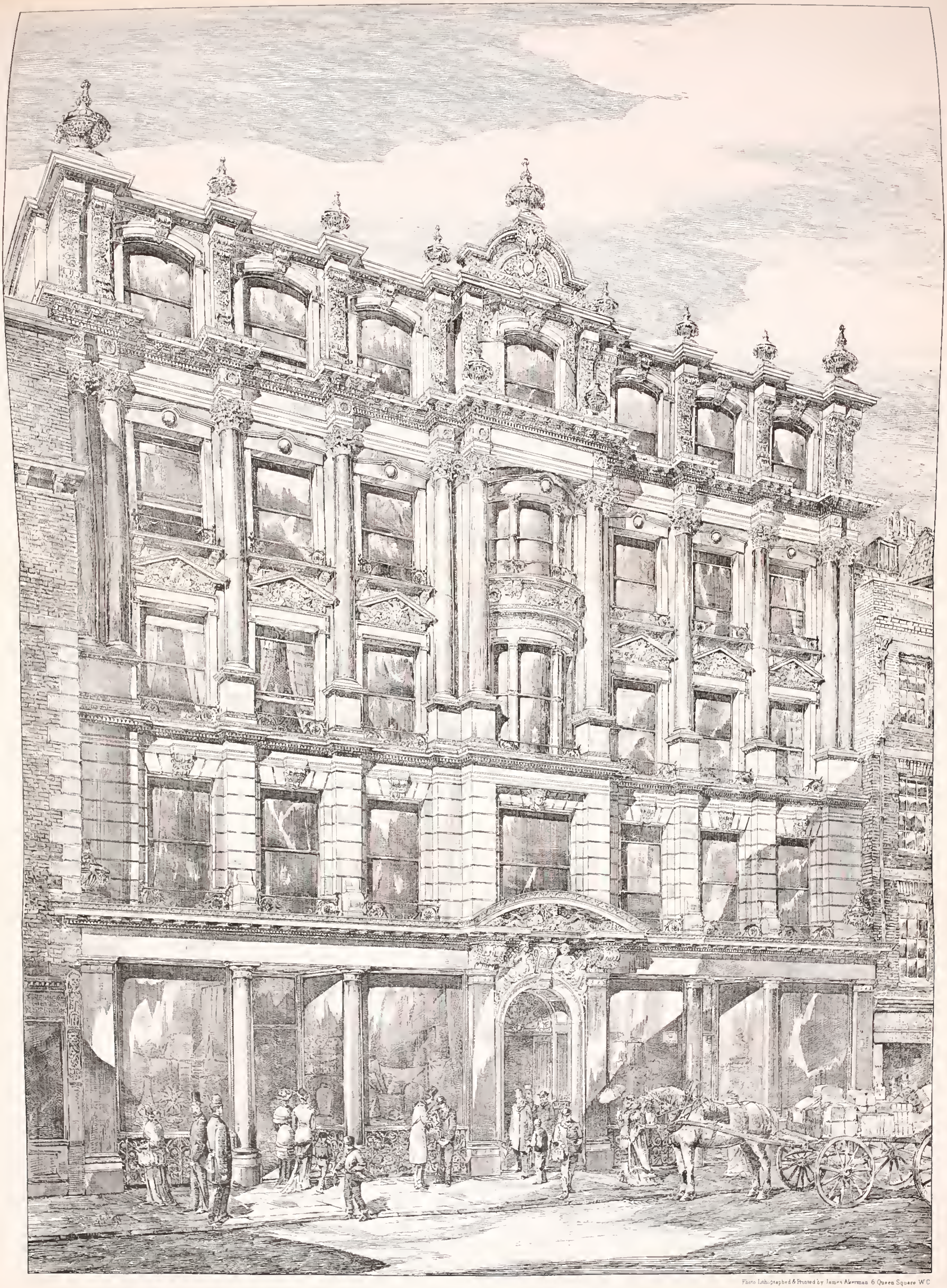
·St: Johns: Hospital: Rye·

: Erected 1576:

Note: All the woodwork executed in Oak:

Measured & Drawn by Hy Ward. Aug 1878

Photo Lithographed & Printed by James Akerman, 6, Queen Square W.C.



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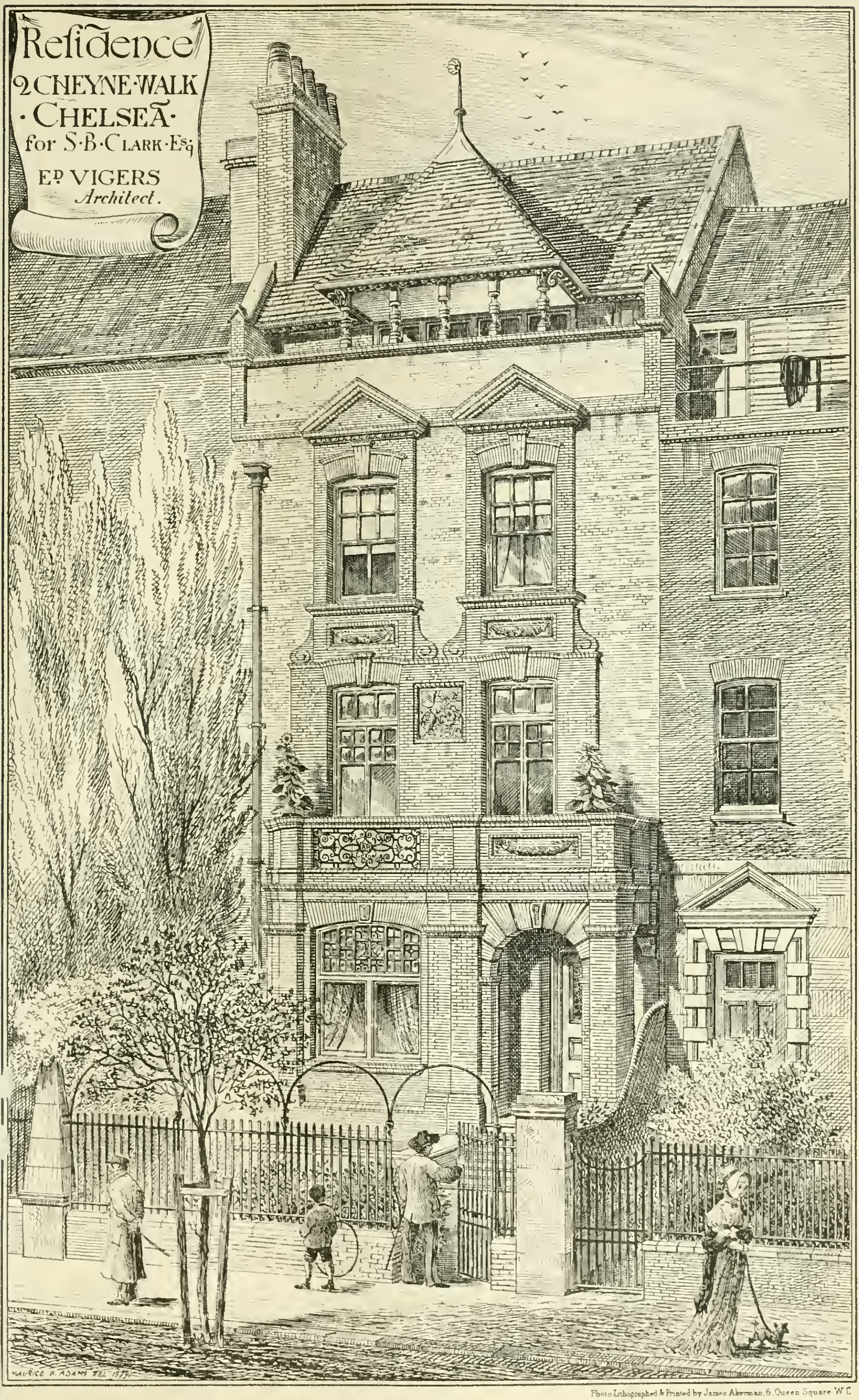
LEADENHALL HOUSE 99 TO 103 LEADENHALL STREET. E C. J LEWIS HOLMES ARCH^T

THE BUILDING NEWS SEP 26 1879



· CADOGAN - TERRACE

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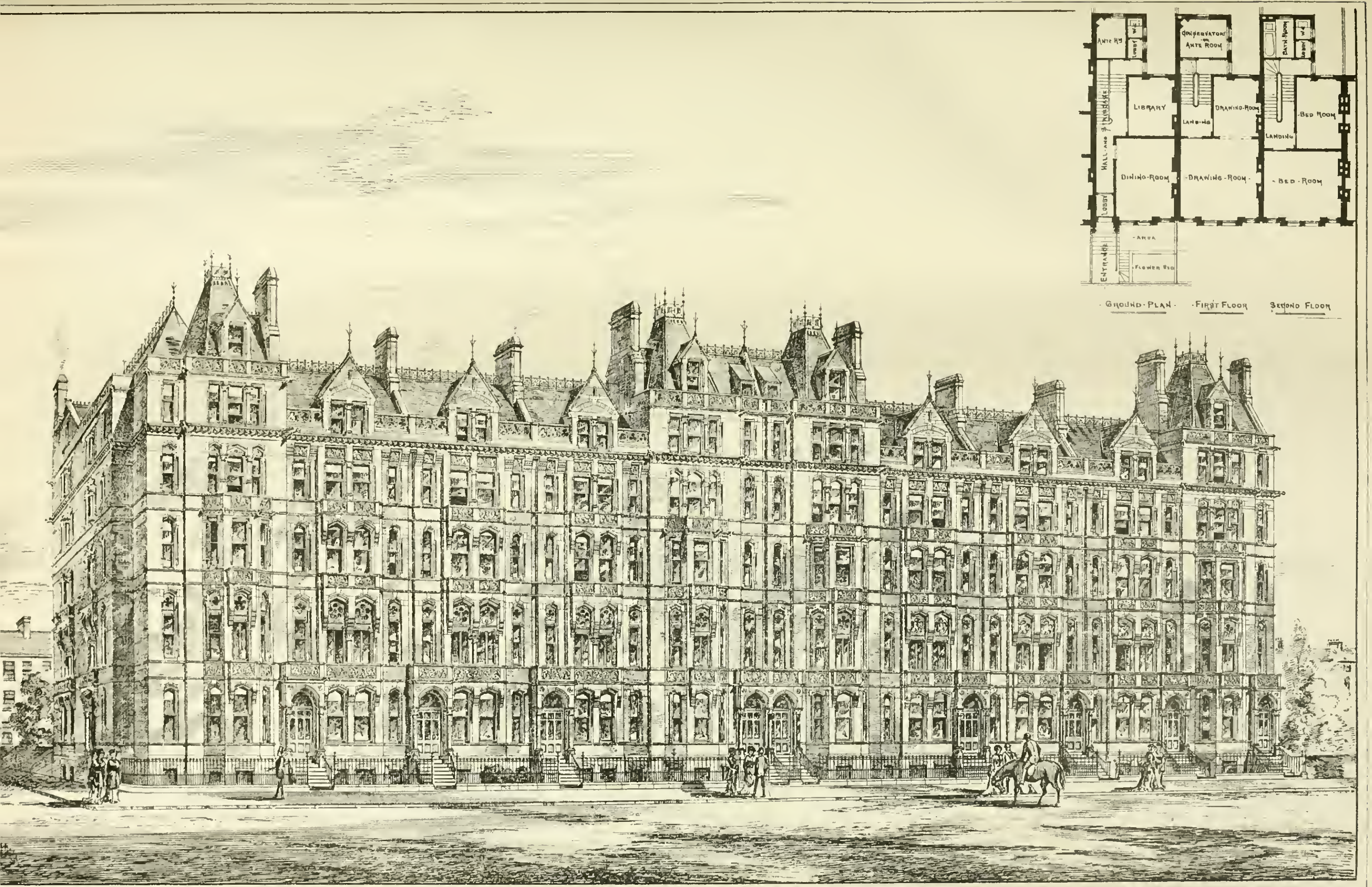

Lithographed & Printed by James Akerman, 6, Queen Square W.C.

· CADOGAN · AND · HANS · PLACE · ESTATE ·

· CADOGAN · TERRACE ·

· ROBERT · KEIRLE · F.R.I.B.A.
ARCHITECT
· Qxi · VICTORIA STREET · WESTMINSTER

SILICATED STONE FOR SEWER TUBES.

By J. W. Butler.*

Many will, no doubt, remember the opposition to the introduction of the glazed earthenware pipes; many and fierce were the battles fought, but slowly and surely they made their way, owing to their greater fitness for many positions than the ill-constructed barrel drains of the period. In sound pipes there are, at all events, only two joints, one at either end; but in "barrel drains," unless constructed with radiated bricks and laid most carefully in cement, there is a drain full of joints. The manufacture of cement pipes was commenced at East Greenwich, in the premises lately held by the proprietors of Ransome's Artificial Stone Company, which are admirably situated for the purpose on the River Thames. The *modus operandi* may thus be briefly described. The material to be crushed, whether Kentish ragstone, slag, granite, or Thames gravel, is taken to a Blake's crusher and reduced to the required size; it is then passed through a washing machine, where every particle of dust is eliminated, then to a mixer, and from this to the machines for pipe-making or other purposes. Before leaving this part of the subject, the washing of all material, *however* apparently clean, cannot be too much insisted upon, for it has been found from numerous experiments that the washing makes a difference in the tensile strain of the briquette samples of from 15 to 25 per cent. This is beyond dispute. The character of the machinery employed is as follows:—

The mixing machine consists of a circular iron trough, with part of the bottom cut away, and replaced by a plate put underneath, and so arranged that it can be moved either to close the opening or expose it, handles being attached to the plate for this purpose. A vertical shaft passes up through the centre of this trough and carries a bevel wheel at its upper end driven by means of a bevel pinion mounted on a pulley shaft. Upon the vertical spindle, and close to the bottom of the trough, two mixing arms or paddles are placed. These in revolving thoroughly mingle the cement and ballast, which are moistened by means of a rose nozzle. The amount of water added is variable and determined by experience; it must be sufficient to permit of the mixture, when prepared, retaining a true surface when smoothed over with the trowel. The concrete is then taken to the moulding machines, of which two different arrangements are employed, the first for smaller pipes up to 12in. diameter, the second for those to 2ft. or 36in. diameter. The former machine consists of a wooden frame, carrying at a convenient height the moulding table. A large circular opening is made in the middle of this table, and the space is occupied by a slightly-coned hopper, the centre of which is cut away so as to leave a circle corresponding to the size of the pipe being moulded. The moulds are placed in pairs upon a board running on the rollers before mentioned as constituting the tramway, and one of these moulds is brought under the machine, immediately beneath the mouth of the hopper. A cylinder of such a diameter as to enter freely the annular space between the inner and outer side of the mould is mounted on a vertical spindle, placed in the centre of the machine, and driven by bevel gear. A key-way is cut down the whole length of this spindle, and a feather in the top of the cylinder enters it, and is thus rotated, although it is left free to rise and fall. At the bottom of the cylinders are four projections of the thickness of the pipe to be moulded. These projections each extend a considerable distance around the cylinder, but do not touch, so that between each a space is left to allow the concrete to fall into the mould, and to facilitate this the projecting pieces are bevelled off on the underside at one end. The top of the cylinder is formed with a projecting rim, and over it is placed a loose bar, through which the vertical shaft passes. A lug at each end of the bar on its underside is placed so as to catch the projection around the top of the cylinder, which can thus be raised at pleasure. When the mould is in place, and the cylinder at the bottom of the annular space, some concrete is fed in from the hopper at the top, and the machine is set in motion. The spaces between the projections around the bottom of the cylinder allow the concrete to fall, and the rapid motion of the cylinder, combined with its weight, serves to compress the concrete in the mould. Gradually, as the material is fed in and becomes compressed, the mould is filled, and the cylinder is raised, until the pipe is made. At the commencement of the operation it is necessary to raise the cylinder by means of the cross-bar before mentioned, about a foot, and permit it to fall upon the concrete in the mould in order to compress it and secure moulding. As soon as one operation is completed the hopper is lifted, and the board carrying the moulds pushed forward till the second one comes into place, and the work is recommenced. The second moulding machine consists of a wooden framework like the former, but the moulding table has a hole in the centre the size of the pipe to be made, and over the inner part of the mould a cover is made to prevent the concrete from falling through. The stamper consists of a vertical bar with an enlarged head of a thickness corresponding to that of the pipe. Reciprocating and revolving motions are given to the stamper, by means of suitable gearing, which allow blows ranging from 50lb. to 500lb. being given to the concrete in the moulds. As the concrete is fed in and the moulds become filled the stamper bar is lifted, and so is always free during one part of each stroke. The moulds consist of a cast-iron ring to make the base, and of such a shape as to form an ogee socket at the end of the pipe. The outside of the mould is formed of sheet iron bent into a circle and secured by three latches on the outside, and the inside of the mould is also of sheet iron with two latches on the inside. When it is desired to form T pipes or elbows, a circular hole is cut in the outside of the mould, and this is covered with a plate also secured with latches. When a mould is filled the other part of the socket remains to be formed. This is done by adding a little more cement in the top, and placing over a cast-iron ring, the inside of which is formed to the contour of the socket. By hammering the mould upon the concrete and turning it round by hand, the male portion of the joint is made, and it is finally trimmed off with a trowel. After the pipes have remained sufficiently long in the moulds, they are taken out and placed in a bath of silicate of soda to hasten their induration. Mr. Baldwin Latham having suggested that the material should be subjected to certain tests, Mr. Henry Reid was employed to test the pipes,* with the following result:—

No. 1 briquette fourteen days old, and kept in water, having a breaking section 2·1in., broke at 496lb., being equal to 236lb. per square inch. No. 2 briquette, seven days old, and kept in water, having a breaking section of 2·06in., broke at 464lb., being equal to 224lb. per square inch.

The samples of material were carefully analysed, and the chemical value of the gravel compound found to be as follows:—

Water and loss	5·15
Oxide of iron and alumina	3·47
Lime	15·23
Soluble silica	10·80
Silica in the shape of pebbles and quartz	62·20
Magnesia, alkalies, carbonic acid	3·15
	100·00

Mr. Ellice-Clark, in making a series of tests, found the cracking weight of a 21in. tube, submitted by the author, to be 7,245lb. The form of joint is an ogee. In laying the pipes they are luted with a thin slip of Portland cement of about the consistency of cream, and the pipes themselves being formed largely of the same material as the cement forming the joint the whole drain becomes practically monolithic. Among the advantages claimed for silicated stone pipes may be mentioned their greater strength when compared with glazed stoneware pipes, the ability to make a more perfect joint, the ease with which the works can be inspected before the ground is filled in, and their non-liability to split longitudinally when placed in positions where great traffic occurs.

Mr. Baldwin Latham, in his work on "Sanitary Engineering," points out "that a concrete pipe is capable of withstanding the jars arising from heavy traffic over the streets even better than an earthenware pipe, which is a quality of no small advantage, he having found that in some districts earthenware pipes have been found to split in a singular fashion, the cause of failure being due to the constant tremor of heavy traffic in the streets." It is curious that small percussive taps may injure a glazed earthenware pipe, causing it to what is technically called fret, this being a starry fracture of the salt glazing. When thus injured, many pipes are unable to withstand the damaging action of sewage matter and sewage gases. The silicated stone pipes are not nearly so brittle as stoneware, and a blow which would shiver completely an ordinary earthenware pipe would simply drive a hole, *without starring*, through a silicated stone pipe. This, it will be readily understood, is an immense advantage, as from this peculiarity connections may be the more readily made when additional junctions are required.

Tests have been made to try the joints. Two pipes were cemented together for some time (about 11 days) and then submitted to a tensile strain, and their separation has not been effected even with a depended weight of a ton and a quarter. Another experiment consisted in having a length of 12ft. of pipes cemented together and supported on bearings 11ft. apart. Upon the middle of this weights of nearly a ton were placed, and fracture took place about 6in. from the third joint, which was not in the slightest degree injured. Their fitness to sustain the pressure of a head of water has been fully proved by an erection of pipes 30ft. in height filled with water, the slightest indication of leakage or precolation not showing either at the joints or in the body of the pipes.

Silicated stone pipes are much benefited by contact with sewage and the gases generated by it. This is borne out by Mr. W. Macklay, in a paper read by him before the American Society of Engineers, where he says that he had twenty-five tests made of Portland cement mixed with fresh water and immersed in sewer water, which averaged a tensile strength per square inch of 306lb. Of a similar number of tests, made with fresh water and immersed in fresh water, the average strength was only 265lb., thus showing that concrete is positively benefited by being immersed in sewage. This is caused by the soapy substances containing silica in the sewage uniting with the Portland cement and assisting to harden it. During the construction of important sewers to which was connected the waste flow from certain chemical works, the author found that the gases generated acted on the brickwork so as to completely destroy the structure of the bricks, but leaving the Portland cement joints uninjured, and forming a sort of honeycomb, thus proving that Portland cement pipes are infinitely superior to brick sewers in their lasting properties.

Too much stress cannot be laid on the importance of testing the cement used for specialities, or indeed for any structural purpose. Owing to the comparatively thin wall of the pipes, it is a necessity that cement should be of the very best quality—heavy, slow-setting cement—finely ground to a fifty linear gauge, if possible, and with not more than 10 per cent. residuum. The cement should not be used earlier than two or three months after grinding, nor before the cement has been spread out in a waterproof building on a dry floor, and protected from the rays of the sun. Cement which has been subjected to the sun's influence for a length of time has been found to have deteriorated in a very remarkable manner. Neither should cement that has once "set" or "gone-off" be used for any special purpose. The use of such cement has been the cause of much annoyance, and has given rise to much correspondence with the cement merchant or manufacturer, who is not to blame otherwise than for having sent cement direct from the stores for the use of the customer. As long as users will buy cement from the manufacturers without guarantee as to age, they will be subject to many of the risks of using a bad cement. Although age will not make a bad cement good, it will rectify some of the dangers of an over-limed cement. That cement should be made of one uniform quality cannot be too much insisted upon, but, whilst the raw materials of which cement is made are put into the wash-mill in such a delightfully primitive style—trusting to Bill, Jack, or Harry's eye to gauge the quantity filled into each barrow—what can be expected but that cement will differ in quality? Every care should be taken that the mud and chalk are as nearly as can be in one uniform condition, and then each should be carefully weighed in the proper proportions. Cement manufacturers will perhaps contend that this would add to the cost; but it would be so infinitesimal, and the gain in quality would be so great, that the result would be largely to their advantage, and their brand could be relied upon. At present, scarcely any English manufacturer's cement is uniformly good, for the reason just detailed. On two occasions the author has been shown over the works of the great Boulogne cement manufacturers, Lonquéty and Co., and was much struck with the exactness with which every detail was performed, contrasting very favourably with the modes here. For the materials of which cement is made, no country is so favourably situate as England, and it only remains for the manufacturers to use the care taken in several of the large foreign works to get cement of the same high quality, and take the lead. The cement made by the Stettin firm, Toepffer, Grawitz, and Co., is of very high quality, and they guarantee the cement, after a seven days' test, to stand 1,280 lb. breaking strain on $2\frac{1}{4}$ square inches. The cement supplied by this firm to that of the author has been of a very excellent quality.

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* Paper read by the author before the recent meeting of the Association of Municipal and Sanitary Engineers.

* The samples were made of the ordinary material used in the manufacture.

In the discussion which ensued on the paper, Mr. Reid remarked that he was sorry to find in Mr. Butler's paper an evidence of want of accurate knowledge of the true properties of good Portland cement. The author stated that cement should be kept from two to three months before it was fit to be used for concrete purposes. It would be impossible for manufacturers to keep a sufficient stock to allow of this being carried out in practice; and even were it possible, it would only be encouraging a false system, direct opposed to the proper manufacture of Portland cement. He had advised the author to use the cement of Messrs. Toepffer, Grawitz, and Co., who voluntarily undertook to guarantee the cement, and who did not keep an ounce of stock to overcome their blemishes of manufacture. When the cement left the grinding and sifting machinery it possessed the desired qualities, and was as accurately mixed as the ingredients in any other chemical process. He said there was a difficulty in arriving at the relative values of cement owing to the variety of testing machines which were employed. He thought the President had done as much as any engineer to reduce the matter of testing to a standard. The German operations of testing were very different to those in vogue in England, and their manufacturers produced cement of great strength. He had a briquette of German cement which had broken at 1,630lb. on the square inch of section, not on the section of 2·25 square inches, and he thought English manufacturers ought to be able to produce similar results.

Mr. Deacon (President) said that his experience was that cement certainly improved by being kept a few weeks.

Mr. Butler thought that the uncombined free lime became neutralised by atmospheric action. He was happy to find that the competition of Germany in English markets had had the effect of improving the quality. His firm had bought the German cement on the express understanding that it had been manufactured for more than six months.

Mr. Ellice-Clark wished to make a few remarks on the concrete tubes themselves, as he was under the impression that he was the first to use concrete tubes in England for sewer purposes. Two and a half years ago he laid an 18in. concrete pipe sewer in an 18ft. cutting in stiff clay, which was almost waterlogged, and he recently went down the manholes and found the material perfect in every respect. The pipes had sustained the weight, and being always in the water the cement had indurated more quickly than in the open air. He had effected a saving of 33 per cent. in the cost of work at Hove by the use of these pipes, and he had used them 24in. in diameter in cuttings 15ft. to 18ft. deep. In all cases concrete was put over them. At Brighton concrete could be obtained from 7s. 6d. to 9s. per cubic yard. So far he had had no failures, and believed the more the subject of concrete tubes was inquired into and investigated the more they would be used.

Mr. Morant thought that the weight of 2,400lb. given in table C for a 24in. pipe was a very small result. In consequence of finding some 30in. pipes broken with longitudinal cracks at the top he had a short time back made the following experiments at Leeds. A trench was cut in clay ground to the exact shape of the lower half of the pipes, and they were covered with earth to the depth of 1ft. The pipes were loaded with pig-iron as follows over a length of 3ft.

Pipes.	Thickness.	Weight applied.
30in. diameter ..	$2\frac{1}{8}$in.	10 tons 3 cwt.
30in. by 21in. ..	$1\frac{3}{4}$in.	10 ,, 3 ,,
24in. diameter ..	$1\frac{1}{2}$in.	8 ,, 2 ,,

With these weights there was no sign of injury in any of the pipes.

A 30in. drain-pipe was also tested at the Corporation yard, Leeds, in gravelly and sandy ground, the bottom not being so exactly cut to the shape of the pipe as in the first experiments. The pipe cracked longitudinally under a weight of 7 tons of pig-iron over a length of 3ft.

Further trials were made at the Corporation yard, where a trench was dug in gravelly and sandy ground without cutting the bottom of the trench to the shape of the pipe, but straight down, leaving the sides to be filled in with earth. The pipes were all loaded with pig-iron until fracture occurred, which in all cases was longitudinally. The length of bearing on the pipe was 2ft. 3in. The weights were as follows:—

Pipes.	Thickness.	Weight applied.
24in. by 18in. ..	$1\frac{1}{2}$in.	.. 5 tons 19 cwt.
18in. diameter ..	$1\frac{1}{4}$in. & 1/16in.	.. 5 ,, 7 ,,
20in. by 15in. ..	$1\frac{3}{8}$in.	.. 6 ,, 11 ,,
15in. diameter ..	$1\frac{1}{8}$in.	.. 4 ,, 2 ,,
16in. by 12in. ..	1 1/16in.	.. 2 ,, 15 ,,
12in. diameter ..	1in.	.. 3 ,, 16 ,,

The chief cause of failure seemed to be the insufficient support of the sides of the pipe when the ground is excavated wider than the pipe, and the sides filled in loosely or with inadequate ramming of the earth. The space being narrow it is difficult to ensure the earth being rammed sufficiently solid round the pipe.

Mr. Lobley had not had any experience with concrete pipes; however, in his district (Staffordshire) broken pottery formed the principal aggregate for ordinary concrete. Mr. Wood in his paper had alluded to the aggregates being broken vitreous stone-ware. This was, no doubt, good if properly broken up, but it should not be glazed. He agreed that it was undesirable to retain the fine sand. The strength of the German cement said to have broken under a weight of 1,630lb. would depend on the length of time it was made.

Mr. Reid remarked that the sample he referred to was made up and broken on the 28th day.

Mr. Lobley further said that he had had English cement which had stood a test of 1,000lb. on the square inch at twenty-eight days, the same cement having broken at 460lb. on the square inch at seven days.

Mr. Cole had found several pipes in a shallow cutting broken along the top in a manner similar to those experimented upon by Mr. Morant, whereas, when the earth-pressure was great the pipes were sound. This convinced him that fracture was caused from the upward pressure of air in the inside of the pipes; he therefore had ventilating shafts introduced, and found the pipes answered remarkably well.

The President said that what Mr. Reid had remarked in respect to cement purging had given him much pleasure. If English manufacturers could supply cement that would not require purging, time and trouble would be saved owing to its not having to be stored. At Liverpool the cement was stored in a small warehouse. It was first hoisted to the upper chamber, where it was laid out on the floor; it was then let through a trapdoor to the next room, where it was spread out and turned over from time to time, and then carted to wherever it was wanted. The increase thus caused in the actual strength of the cement was often 100 per cent. He admitted it would be better if this were not necessary, but he thought it must be admitted that cement could not be obtained in England straight from the kiln which would not require purging. His experience was that great fineness increased the strength of the cement when used for concrete. When used for mortar in proportions not greater than one to three there was no appreciable increase, as the particles of the coarser cement were sufficiently numerous relatively to the particles of sand to envelop them.

Mr. Parry did not consider that concrete pipes would readily take the place of others now in use. However, he thought Portland cement concrete slabs might replace York paving in the south of England, as they cost but two-thirds the price, and looked remarkably well when down. As regards wear, he had seen the artificial slabs outwear the York flags.

Mr. Sharp regretted that Mr. Woods, the author of the paper on rock-concrete tubes, was not present. He might say, in reply to Mr. Reid's insinuation (if such it could be called), that good Portland cement could not be obtained in England, that the firm to which he belonged used very large quantities of this material, and that they experienced no difficulty in obtaining all that they required weighing at least 116lb. to the bushel, but he could not say that it would reach 140lb. to the bushel.

Mr. Butler regretted that his views did not coincide with those of Mr. Reid on the question of using the cement direct from the manufacturers. He was satisfied that English cement ought to be stored, but he was pleased to hear that Germany could supply cement that could be used at once, as in the event of a press of work it could be sent for to that country.

CHIPS.

The Great Eastern Railway Company's new market, alongside Stratford-bridge Station, will, it is said, be ready for opening on the 1st of next month. Standing room is provided for more than 400 trucks, and the cart-roads between the sidings are 40ft., 50ft., and 60ft. wide. The warehouses measure 60ft. by 45ft., are fitted up with convenient offices, and two lines of rails run through each

During the past week the Chancellor of the Exchequer, assisted by his sons, Mr. H. S. Northcote and the Rev. A. F. Northcote, has been engaged in archæological researches of an interesting character on the right hon. baronet's estate at Pynes. Attention was chiefly devoted to two barrows in the Nine Oaks field, and although neither pottery, ornaments, nor bronze weapons were found, yet other discoveries were made which will lead to the opening of some of the numerous undisturbed barrows in the immediate neighbourhood. Nine or ten years ago Sir Stafford Northcote opened a barrow in the same field as that in which those are situated that have this week been dealt with, and the results then obtained are now in the Albert Memorial Museum at Exeter.

On Wednesday, the 17th inst., the foundation stone of St. Paul's Vicarage, New Southgate, was laid by the Rev. J. Baird, vicar of Southgate. The house is being built of Kentish rag stone, with Bath stone dressings. Mr. A. R. Barker, of 11, Buckingham-street, Strand, is the architect, and Messrs. L. and W. D. Patman, of Enfield, the contractors, the amount of the contract being about £2,000.

A memorial font was placed last week in St. Botolph's church, Colchester. It was designed and executed by Mr. T. J. Watts, of High-street, Colchester.

A new vicarage has been erected at Chatburn, near Clitheroe, at a cost of £2,500. Mr. F. J. Robinson, of Derby, was the architect.

A new Congregational chapel was opened in Lower High-street, Portmadoc, on the 12th inst. It measures internally 70ft. by 48ft. 6in., and is 31ft. in height. The masonry is executed in Portmadoc Wharf rock-stone, Tremadoc granite, and Anglesea limestone, Aberdeen red granite being used for the columns in the front. The joinery is of pitch-pine, with mahogany mouldings, the columns being rounded with black ebony. The gallery-front and rostrum have carved panels. Mr. Owen Morris Roberts was the architect, and the chief contractors were Messrs. William Jones and Evan Humphreys. The chapel seats 900 persons, and has cost about £5,000.

St. Helen's parish church, Willoughby, has been completely restored, and will be reopened by the Bishop of Lincoln on the 9th prox. The work carried out includes new roofs, new flooring and reseating, and removal of organ to chancel.

A massive brass eagle lectern, manufactured by Messrs. Jones and Willis, of London and Birmingham, has just been placed in St. John's Church, Hull, as a memorial of the Rev. H. W. Kemp, who has just resigned the incumbency.

A company for the purpose of erecting a hydropathic establishment and sanitorium on the well-known Clent Hills, Worcestershire, has been organised; the capital of the company is £50,000, divided into 10,000 shares of £5 each. Mr. David Mackenzie is the Company's secretary, and the architect is Mr. F. Smalman Smith, of Stourbridge and Birmingham.

COMPETITIONS.

Greenock New Municipal Buildings.—On Monday the Town Council of Greenock decided to adopt the design "Art and Science" for the new municipal buildings which are to be erected on the site of the present offices in Hamilton-street. As a result of the invitation to architects, about 50 designs were sent in from England and Scotland, and these were considered by Mr. Charles Barry, of London, who recommended six plans as the most suitable from which to choose the successful design. After considerable delay, the Council have selected the following three as having gained the 1st, 2nd, and 3rd prizes in the competition:—(1) "Art and Science," by Messrs. H. and D. Barclay, Wellington-street, Glasgow; (2) "Omega," by Mr. Beatson Habershon, Ealing, Middlesex; and (3) "Let Greenock flourish," by Messrs. Moffat and Aitken, North St. David-street, Edinburgh. "Art and Science"—the plan upon which the new municipal buildings will be erected, and which will cost not less than £8,000, exclusive of site, &c.—is Renaissance in style, and the buildings, which will have a height of four stories and attics, and in some portions of five stories, will have elevations fronting Hamilton-street on the south, Dalrymple-street on the north, Taylor's Close on the west, and Cathcart-square on the east. On all the elevations, and more particularly on those facing Hamilton-street and Cathcart-square, there will be a fine display of ornate and effective architecture, and the general effect from any of the elevations will be grand and impressive. Niches will be provided in the stonework for past and future distinguished Greenockians, and a tower, with a dome 180 feet high, will occupy the frontage to Cathcart-square. A new central entrance hall will be built at Dalrymple-street end, giving access to two new staircases, communicating with every floor of the hall, but chiefly intended for gallery audiences. A carriageway, with also a footpath ten feet wide, will enter at the west side from the new square, and passing the front of the Town Hall, debouch upon Cathcart-square. Between the line of carriageway and the old front of the hall will be erected a new vestibule, with cloak and retiring-rooms, and a new saloon; a corridor will run along the whole length outside the west side of the Town Hall, and connected with it at several points, and with the staircase at the north and south ends. This carriageway will be roofed over its entire length. The principal municipal offices will front Hamilton-street. The rates offices and the offices of the Harbour Trust will occupy the centre block towards the new square; the corner block towards Dalrymple-street will be principally occupied as general business offices, to be let; and the whole of the space to the east of the Town Hall, and fronting Dalrymple-street, will be occupied by the police department. The apartments to be devoted to the business of the Council and committees of the various public trusts will be grouped together in such a way as will give a palatial effect to the whole, and will be an unusually fine suite of rooms. The most ample office accommodation is provided for not only all the present officials of the town, but for such as its future extension may necessitate, and the surplus accommodation will in the mean time be let. One of the features of the new buildings will be the central hall, to be used in the collection of the rates and taxes. There will be here five departments, each with a separate counter for the public, and each department having, in addition, two rooms attached. As it was part of the scheme of the Town Council to provide for the cost, to some extent, by erecting shops on the Hamilton-street frontage, the architects in the plans adopted have designed a piazza or covered pavement with arches open in front and also with roof-lights—a Continental method of reconciling the commercial element with the public character of the building. This is a point which has given rise to differences of opinion in the Council, but by that arragement the street will be widened 10 feet more than intended by the Improvement Trust. The elevations are shown to be carried around all the frontages in one uniform spirit of Italian architecture, treated after the manner exemplified by the French in the Louvre of Paris. The tower over the carriageway in Cathcart-square is a massive yet elegant architectural composition of original design, but in perfect keeping with the general design of the buildings. The motion to proceed with the erection of the buildings was this week carried unanimously, and it is expected that operations will be commenced immediately.

Newark-on-Trent.—We hear that Mr. Mawson has reported on the plans sent in for the Newark hospital as follows:—

1. Wm. Bliss Sanders, Nottingham.
2. Goddard and Son, Lincoln.
3. Freeman and Naylor.

We believe the committee will abide by his decision. Mr. Hine stated in the report which accompanied his design that his plans could not be executed except at an additional cost of £500 beyond the stipulated estimate.

Woolwich.—We have been informed, since the publication of our notice of the competition for St. Mary's Church, Woolwich, on page 356, that Mr. T. N. Laslett, of 37, Walbrook, is also a competitor. We believe the designs will be on view shortly.

Building Intelligence.

Aston.—The memorial stone in connection with the restoration and enlargement of Aston parish church was laid on Wednesday. The church was founded as early as the Conquest, being dedicated to St. Peter and St. Paul, and there are records showing that 300 years after that period the building was enlarged, and about 90 years ago it underwent a process of renovation. The church consists of a nave, with a lofty tower and spire at the west end, and north and south aisles and chancel. The nave and chancel are the oldest parts of the edifice, and are in the transition style from the Early English to the Decorated periods of architecture. The north and south aisles were added at a later date, probably during the reign of Edward II. The nave has a clerestory of Late Perpendicular work, and the tower and spire are of the same period. The church, however, is chiefly interesting from an historical point of view, on account of the monuments which it contains, there being examples of various periods from the 14th to the present century. For a considerable time past the church has greatly needed repair, and it has been found also too limited in space for the requirements of the congregation, a little over 500 being as many people as the building would accommodate. To meet the want, therefore, it was decided to extend the nave and aisles in an eastward direction as far as the present chancel reaches, and beyond this to erect a fresh chancel, placing the monuments in positions corresponding to those which they have hitherto occupied at the east end of the south aisle. Then it is proposed to open the tower into the church, to raise the roof and clerestory windows to a suitable height, to remove the present high stalls, and reseat the church throughout. The work will be carried out in parts, and when all is completed there will be accommodation for about 1,300 people. The work is estimated to cost from £8,000 to £10,000. The work of extension has already been commenced, and during the progress of the work last week an interesting discovery of four coins was made at the end of the south-east corner of the chancel, under an old sedilia. Three of the coins belong to the period of Edward I., and the other is one of Alexander III. of Scotland. The architect who has the superintendence of the work in hand is Mr. F. A. Chatwin, and the contractors are Messrs. Davies Brothers, of Birmingham.

Birchfield.—A new Congregational church at Birchfield, near Birmingham, was opened on Tuesday. The structure is of brick, with Bath stone dressings. The tower is surmounted by stone angle pinnacles, and a stone spire which reaches to a height of over 100ft. There are four spacious vestries at the rear of the church, with a separate entrance. The architects were Messrs. Ingall and Hughes, of Temple-row West; and the builder, Mr. W. Bennett, of Berners-street, Lozells. The total cost of the building and fittings is between £5,000 and £6,000.

Bristol.—The United Free Methodists of Fishponds are engaged in the erection of a new chapel, and the ceremony of laying the memorial stone took place on Monday. The style is to be Gothic, and the masonry will be of Pennant stone with freestone dressings. The dimensions will be—length 65ft., width 43ft., and height 46ft. The architect is Mr. Chapman, of Frome, and the contractor, Mr. E. Clark, of Fishponds, who has sub-let the carpentering to Messrs. R. and J. Davy, of Clifton, and the plastering, painting, and tiling to Messrs. Lewis and Son, of Clifton. Including the land, the building is to cost close upon £1,700.

Cirencester.—New Board Schools in Lewis-lane were opened on Monday. They accommodate 200 boys, 180 girls, and 120 infants, and have residences for master and mistress. The schools are plainly treated in the Tudor style, and are constructed of local stone with Bath dressings and roofed with Broseley tiles. They form three sides of a square, the infants being in the centre, and some fine old trees have been left in front of the buildings; a tower on the chief elevation contains the cistern for water-supply. The fittings are of selected red deal and pitch pine; ventilation is provided for by Dr. Bond's patent perdifumes and extraction flues connected with Howorth's self-acting ventilators. The lighting in principal rooms is by the Wigham gas-burners. Mr. Capel Nankivell Tripp, of Gloucester, was the architect; Mr. George Drew, of Chalford, the contractor; Mr. M. Candle, clerk of works; and Mr. Greenslade, builder's foreman. The ironwork has been executed by Messrs. Chew, of Stroud, and Alexander and Thompson, of Gloucester; the tar paving by Mr. Geo. Melsom, of Bristol, and desks and fittings by Messrs. Colman and Glendenning, of Norwich. The outlay has been between £5,000 and £6,000.

Daybrook, near Nottingham.—Schools accommodating 200 children were opened on the 22nd. They are in two departments—a mixed school and infants' school. Each school has a lavatory and cloakroom. They are built of brick with Bath stone dressings; the roofs are covered with Wilkinson's roof-tiles; the front to road is broken up by dormer windows and a small oak bell-turret, the roof of which is of lead. The roofs show the timbers, which are stained and varnished. The height to wall-plate is 13ft., the walls are boarded 5ft. high, stained and varnished. The works were executed by Messrs. George Smith and John Greaves, of Arnold, at a cost of £1,540, which includes the boundary walls, fittings, &c. The buildings are built from the designs and under the superintendence of Mr. Robt. C. Clarke, architect, *Journal* Chambers, Nottingham.

Hinton Hampner.—The parish church of Hinton Hampner, Hants, is being partially rebuilt and restored from the designs of Mr. Capel N. Tripp, of Gloucester. The existing chancel was rebuilt in 1845, and is Early English in character; the new nave, vestry, tower, and south porch being rebuilt in accordance therewith. Some interesting old features are retained and introduced in the new fabric. The old nave, brick south porch, and wooden bell-turret were in an advanced state of decay, and the work has been taken in hand none too soon.

Ipswich.—The extensive restorations which for some time past have been going on at St. Mary Key Church have now approached completion. Up till 1875 the church had been in a very dilapidated condition, but in that year an attempt was made to inaugurate a new order of things. The old pulpit, a fine specimen of Jacobean work, has been lowered and restored, and a new east window and three in the south aisle erected. The old painted boxes have been replaced by substantial oak benches. The bench-ends of the centre aisle are elaborately tracceried with carved heads, representing various kinds of wild flowers. A new prayer-desk has also been added. Altogether the church presents an entirely new appearance, much more in accordance with the beauty which, judging from all appearance, characterised it in the past. The work has been carried out by Mr. R. S. Smith, of Ipswich, from designs by Mr. H. M. Eyton, the architect. The carving has been done by Mr. Robt. Minter, of Ipswich.

Mexborough.—About seven years ago the then Local Board thought it desirable that an open market should be established in Mexborough, and a suitable site was obtained, and an open market was at once commenced. Since that time the market tolls have increased to such an extent that it was found desirable to erect a market-hall, or covered market. Plans were drawn and tenders received for the erection of the buildings, the total cost of which, with internal fittings, is to be about £4,000. Messrs. Wortley Brothers, of Kilnhurst, are to do the masons', bricklayers' work, &c., and Messrs. Haggard and Bunby, of Rotherham and Mexborough, the whole of the ironwork. The building is to be in the Classic style of architecture. On the basement floor are to be eight cellars, each 57ft. by 9ft., together with a public weighhouse. On the next floor is the market-hall, 93ft. by 57ft., with three approaches from south, east, and west, each 8ft. wide. On the north side will be the clerk of the Local Board's office, collector's office, surveyor's office, and above these will be a large board-room, about 38ft. by 25ft. The building is to be of pressed brick, with stone dressings. The ceremony of laying the memorial stone took place on Monday.

Monkokehampton.—All Saints' Church, Monkokehampton, had its new reredos dedicated on Monday week. The reredos, in its lower parts, is of plain Caen stone ashlar, corbelled out, just above the Holy Table, by brackets in the same material. These carry the re-table, which is of moulded polished Ogwell stone, a warm, red variety of Devonshire marble. The structure above is composed wholly of English oak, save that the columns—the *fleur-de-lis* ornamentations and some pateræ, &c.—are of inlaid American walnut, composed of three definite compartments, above the re-table; the central one rises up with a sharp gable. This upon its apex has a column, towering still higher, surmounted by a sculptured figure, which represents St. Michael trampling upon the Devil. The other portions are carried up by boldly-worked buttresses, surmounted, in each instance, by crocketed pinnacles. Between these run carved crestings, and pierced and open panelling. The central panel recesses well back behind the gable, which latter is cinquefoiled, with carved cusps. The reredos is the design of Mr. R. Medley Fulford, architect, of Exeter, and has been made complete and placed *in situ* by Mr. Harry Hems, of the same city.

Northampton.—The new reredos in St. Peter's Church, Northampton, was opened on Thursday week. The reredos is of carved oak, with a painting in the centre of the Crucifixion, and the two women standing at the foot of the cross. This is from the firm of Messrs. Burlison and Grylles, Newman-street, Oxford-street, London. On either side of the painting there are two figures, one above the other, in carved oak, the four representing St. Peter, St. Matthew, St. Mark, and St. Luke. These statuettes of the apostles occupy what would have been the right and left panels, had it been possible to erect a true triptych; but the windows prevented this, and consequently it was necessary to narrow the sides, which, in reality, are carved pilasters, on which rests a crocketed canopy of carved oak, which rises to the recess, in lieu of a window. The entire east wall has been stencilled, the whole of the work being under the direction of Mr. J. O. Scott.

Potter Heigham.—The principal and most difficult piece of engineering-work on the Yarmouth and North Norfolk Railway, the bridge over the river Thirne, at Potter Heigham, has just been completed, and was formally inspected by the directors of the company on Thursday, the 18th inst. It is carried on eight cylinders of 7ft. diameter each, and has a total length of 270ft., and 10ft. headway. It is divided into three spans of 80ft. clear opening each. The cylinders were sunk to a depth of 35ft., hollow, the core of earth being extracted and the space filled up with Portland cement concrete, 800 tons having been used in foundations. Above the water-level the piers are of white brickwork in cement. The girders were designed by Mr. Walrond Smith, and are of novel construction. The flanges are of large channel irons riveted together, and the cross-girders 16ft. apart; the depth of girders is 16ft. The contractors for the railway, Messrs. Wilkinson and Jarvis, have carried out the work under the supervision of Mr. Alfred Pinn. The ironwork was supplied by the Stockton Forge Company. Mr. Walrond Smith is the engineer of the line, which is almost completed from Martham, the present terminus, to Sutton Staithe, about a mile from Stalham, and will be opened to the latter town in a month's time; and the last section, that to North Walsham, will be completed in a few months' time.

Sebergham.—The old parish church of Sebergham, near Carlisle, is being restored and partly repewed, and new chancel fittings have been placed within it. It is of very old foundation, but has lost most of its ancient character by modern innovations. About 80 years since an ugly tower was built and five large debased windows inserted on south side, and a west gallery added and flat plastered ceiling. The rough casting has been removed recently, disclosing several Early lancet windows of admirable proportion, and two ancient doorways, &c. At the east end three lancet windows will be restored on the old lines, traces of which are still existent. They were cut away to insert an ugly Tudor window with wooden tracery and vulgar stained glass. The architect is Mr. D. Brade, of Kendal, and the contractor Mr. T. Laing, of Sebergham.

Southport.—Last week Lord Derby inaugurated some public works of considerable importance at Southport. The first of these is the extension of the Promenade, and the second the building of a new market. To carry out the promenade extension the Corporation are reclaiming some 40 acres of land from the sea. The walk will be carried to a height of 12ft., the front sea wall being of concrete, and the foundations—which will be 3ft. thick—will extend to a depth of 6ft below the shore level. The embankment will be 60ft. in width, 25ft. being devoted to a drive, a similar width to the promenade proper, and the remainder will be laid out as a footpath alongside the houses. Messrs. Gripper and Bayliss, of Nottingham and Hull, have undertaken to form the promenade for the sum of £20,752, and to lay out and sewer the land behind preparatory to building operations, for £11,071, a total of £31,823. The work is to be completed by the end of next year. The new market hall, the cost of which will be £23,800, is to stand on land containing 4,550 square yards. It will be divided into three parts, the first and principal portion being for butchers, poulterers, greengrocers, and provision dealers; the second for fishmongers, and the third will be used as a wholesale market. The contractor for this work is Mr. T. Bridge, Burscough, and the architects Messrs. Mellor and Sutton, Southport, and the late Mr. John Ducie, C.E., London.

Tella Park, Cumberland.—An old building, formerly part of the monastery attached to Calder Abbey, at Tella Park, in the County of Cumberland, but now the residence of W. B. Turner, Esq., has lately been considerably added to, and the old portion restored from drawings, &c., supplied by Mr. T. Lewis Banks, architect, of London and Whitehaven.

University College Hospital.—This institution, which has been closed for alterations and additions, was opened on Monday. For some time past the need for more accommodation has been pressed upon the attention of the managing committee, and by pulling down partition walls, giving portions of the wide landings in the north wing to the wards, and moving the sleeping-apartments of the majority of the nurses and assistants to some adjoining houses, room for 40 additional patients has been obtained, and the number of beds available for urgent cases increased from 160 to 200. Advantage has been taken of the opportunity thus afforded by the removal of all the patients to make some important improvements in the sanitary arrangements of the hospital. Old brick and mortar drains have been replaced by pipes, and means have been taken to prevent the rising of sewer-gas into the building. The sinks, &c., formerly within the wards, are now placed in closets built outside, and the walls and woodwork throughout the interior of the hospital have received a coat of silicate paint. Attention has also been given to the improvement of the ventilation. The operating room has been enlarged by an ingenious method of constructing the folding doors. Many changes have been made on the top floor, where the children's ward is now placed. On this floor a room has been fitted with iron racks, in which the patients' clothes, after fumigation, can be stored until the owners leave. These alterations have been carried out by Mr. W. A. Scurrah from the plans of the two architects, Mr. A. Blomfield and Mr. Shepard, and the cost, including the new beds, furniture, &c., will probably be about £3,500.

Windsor Castle.—At Windsor Castle various improvements are being carried out during the residence of the Queen in Scotland. The level of the approach to the Norman-gate, between the wall of the moat near the Round Tower and the North Terrace, has been slightly altered, making the ascent easier for horses and vehicles. On the Castle-hill the palisading has been painted a deep olive colour, and a number of decorators are engaged in gilding the spear-heads of the railings at the foot of the incline and those near Edward III.'s Tower, which separate the private grounds of Her Majesty from the roadway leading up the hill to the Grand Quadrangle. The steps within Henry VIII.'s Gateway, at the commencement of the terraced part in front of the houses of the Military Knights of Windsor, are being relaid, granite being substituted in places for the softer stone, which has been greatly worn by the constant traffic at this point. The lamps about the approaches are being gilt and decorated, and other work is in hand within the palace. The spear-heads of the palisading at the principal entrance to the Castle, facing the Long Walk, will also, it is understood, be gilt similar to the work already completed nearer the palace.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J, Passmore Edwards.

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Cases for binding the half-yearly volumes, 2s. each.

Received.—H. S.—K. L. B.—H. and Co.—B. of S.—V. S. Co.—J. B. P.—J. H.—W. and A.

Surveyor, Bolton. (Write Rownson, Drew, and Co., 225, Upper Thames-street. The usual size made is 24in. by 18in., price, we think, about 50s., but no doubt they will make the hoppers to any required size.)—A Learner. (You cannot learn to design "from cheap, inexpensive books." The elements of drawing can of course be thus acquired, and Lockwood and Co., and Cassell, Petter, and Galpin publish some good cheap manuals. Why not join the classes of the Architectural Association and the Architectural Museum?)—H. Ambrose. (Reply to hand is too long. More than half of it is devoted to a subject not inquired about. If you will kindly send address we will return it; possibly you can shorten it. Space in "Intercommunication" is limited, and replies should be to the point and as concise as possible.)—An Old Contributor on Hospital Arrangement. (Your letter does not touch the point raised, and is moreover unauthenticated by any name or address.)—Quid. (Write the Secretary of the R.I.B.A.)—Anxious. (We certainly think the first figured girder insufficient in depth for a warehouse floor, and the second one, if it has to support a dead load of 50 tons in the centre, besides a "live load," is scarcely equal to the work. The exact conditions of loading you do not supply.)

Correspondence.

THE ROUND TOWERS OF NORFOLK AND SUFFOLK.

To the Editor of the Building News.

Sir,—As both Mr. Loftus Brock and Mr. Edmund Ferrey accept the opinion that the avoidance of freestone quoins was the reason for the adoption of the circular form of tower in these counties, I am stirred to the expression of my conviction that no such reason governed the selection of that form, but that it was chosen by the early designers purely on æsthetic grounds. Whether these towers had their origin in Saxon or Norman times, it is not my present object to discuss at length; but that nearly all those which the Archæological Association lately visited are of Norman workmanship there cannot be a doubt. The two examples referred to by Mr. Brock—namely, those of Flixton and St. Julian's, Norwich—would not seem to help the Saxon theory very much, as the first is a square tower and has been rebuilt, and the second has no characteristic differing from those avowedly Norman. The east window of the belfry of Herringfleet tower is pointed to as possessing Saxon detail; but the west window of the same tower has no trace of Saxon work, excepting in the pointed lintel to the inner arches of the two-light opening. On the contrary, the main arch is semicircular, after the Norman fashion; whilst a double row of billet moulding forms a margin to the jambs. These are features which point rather to a Norman than to a Saxon origin. But now to turn to the question of what was the reason for the adoption of the circular form in these towers. It would seem to be commonly thought that the saving of stone quoins, as required in a square tower, accounts for the circular form of plan. But one naturally asks, Why should the desire to save freestone both begin and end in respect of tower-quoins? Freestone was found for buttresses, dressings of doors and windows, for quoins of walls and other features elsewhere, and why should the desire of saving be confined to the tower? Again, if the ancient designers wanted quoins, angles were no difficulty to them; if they desired a square form and had no freestone, they would have made them out of their hard flints. This is proved everywhere, especially in the tower of the church of Thorington, which the Association visited, where there is a shallow arcade of considerable height encircling the external face of the tower with the quoins of slightly-projecting piers and semicircular arches, all formed in the rude flints of which the walls are built.

Here alone is sufficient proof that the ancient mason had no difficulty about the want of freestone in the execution of an arris; he uses quoin and arch freely and artistically as a simple wall decoration. The avoidance, then, of quoins in a straight tower wall cannot, it seems to me, account for the choice of a circular plan. Amongst theorists, I suppose, æsthetic design is too simple a reason to be thought of. But let us consider the original ground-plan of the churches where these towers occur. Take Fritton for an example; here, we have an apsidal chancel, a nave without aisles, and a circular west tower, all small in dimensions. Let any artist go to the south-east of this little church and sketch its outline from east to west, or from any point he may choose, and then try to design any more appropriate form than the circular tower. If I mistake not, he will utterly fail. Remembering that all form was open to the designer, and granting that the one he has chosen is the best artistically, is not this sufficient reason for the origin of the chosen form? If a practical reason attends this form it may well be stated that a circular plan is best suited to an exposed situation, such as most of these towers occupy. That the designers of these towers were not afraid of short angle quoins their own work abundantly shows, and surely the bare existence of their work at the present day sufficiently disproves any incompetence.—I am &c., C. LYNAM.

Stoke-upon-Trent, Sept. 22.

HULL ASYLUM COMPETITION.

SIR,—"Lucidus Ordo" excites our surprise in his contribution to the last issue of your journal, inasmuch as he veers round on the questions he raises, and moves his standpoints. He objects in the first instance to our pointing out that his corridors passing through blocks No. 1 are badly arranged; and when used by the patients, that other patients from other blocks must, if they study convenience, pass through the throng of them. He now admits our ground, but qualifies it by saying the objection can only refer to 15 or 20 patients. We never descended to figures, but confined ourselves purely and simply to the principle. These blocks, in the author's schedule, contain 200 patients, and how he can qualify this number down to 15 or 20 is to us a mystery. "L. O." defends this corridor arrangement by saying it occurs in another and a larger asylum; we venture to remark that it may here be questioned whether the two cases are, all points considered, identical. Be this as it may, it is quite clear that so long as the corridor arrangements of our author stands in its present form he has no right to claim as a merit, which he does on page 3 of his report, "that each block may be looked upon as a distinct asylum."

With regard to blocks No. 2, he admits the patients would have to traverse corridors 200 yards in length to reach the dining-hall, although those buildings are not above one-third that distance. If the privacy of blocks No. 1 can be set aside, in the face of this admission, he claims, on p. 8 of his report, "The absence of long corridors which have no other use except that of merely connecting one part of the asylum with the other." Having admitted the necessity of the patients traversing this 600ft. of corridor, he qualifies the evil by saying it would not refer to above ten patients from these blocks, although his schedule shows that he has seventy patients in these wards.

As to our remark about the patients passing the entrance-doors in traversing the northern corridors, our author corrects us by saying the entrance is one story above these corridors. He here alludes to the entrance to the administrative offices; whilst we alluded to the male and female entrances at either end of the administrative block. We may here note that we have never alluded to the patients of No. 3 blocks using the northern corridors; indeed, we never alluded to these wards at all, other than in taking exception to the corridor arrangements on the first-floor, where the continuity in each case is broken by two day-rooms and a "gallery dormitory," fitted up with beds, into which the public corridors merge.

The author's defence in not making the south corridor continuous without passing through the serving rooms, we note; but his opinions hereon and ours are directly at variance: his merit is classed by us as a fault, and we can only say, if it is a merit, it is one that all the other competitors have declined to avail themselves of. With respect to the blind windows in the central feature of the south elevation, we fail to see what other they can be, as the fact of the staircase crossing these large windows at irregular heights is incontestible. As to the absence of day-rooms for the epileptic patients, the author corrected us by saying he intended those patients to jointly use the day-rooms of other patients on the lower floors. Upon our pointing out the impracticability of such an arrangement, he veers round, and now states that day-rooms for these patients are not required. As our ground is simply to maintain our statement, that he failed to provide day-rooms, we may fairly decline to enter into the question whether they are required or not; but we are entitled to remark that all the other competitors were careful in providing such day-rooms.

Our author still objects to our remarks that the staircases are placed at random, and he charges us with overlooking the fact that he intended the upper portions of these erections to be used as water-towers. Our contention is that we did not overlook this point, proof of which is afforded in our remark that this great mass of costly towers, with the exception of one, are for such a purpose wholly uncalled for; as to their use for ventilation whatever the author may say about "new and startling discoveries in physics," we maintain that they were clearly never intended for such a purpose. If our author, instead of composing such phrases, would explain how he proposes to ventilate three-story blocks of buildings into detached towers, when the connection between them is only two stories, and these lower in their stories than the buildings themselves, he would be conferring a favour; and, further, he might explain, having overcome these, to us, insurmountable obstacles, how this system of ventilation would work in the face of another and a distinct system discharging itself above the eaves of the buildings.

The author's opinion, that staircases for the use of blocks being placed in the middle of connecting corridors is "simplicity itself," is one we cannot endorse, and we think the fact of his having to provide other staircases in the blocks is proof of our assertion, that they have "a very confused connection with the blocks themselves."

"L. O." makes capital of the typographical error in our reply, where the total of the scheduled beds is printed 460, instead of 400; as we were defending the latter figures, he might have seen it was not our intention to introduce any fresh ones.

The general readers of your journal will glean from this correspondence that what we class as faults in these designs the author claims as merits, and that the pursuit of such a controversy is useless, as it is a case of blending oil and water. If the author's views are correct all we can say is, that he ought to bear away the prize, for he has clearly no opposition under the headings we have ventured to call into question.

THE WRITER OF THE REVIEW.

[We can spare no space for a continuance of this controversy.—ED.]

SIR,—I cannot think that your columns were ever intended to be the medium for competitors to publish "supplementary reports" on their own designs when still *sub judice;* but it would appear, from the long communication from "Lucidus Ordo" this week, that they are of opinion that your columns should be so used. In fairness to the other competitors, should this be allowed?

I will not go into the merits or demerits of their design, or to discuss those of the Whittingham Asylum (by which they have evidently been inspired), but content myself by calling your serious attention to the matter.

The committee will not, it is hoped, be influenced by what may appear in your columns for or against any of the designs, but will adopt the only proper course, viz., a reference of the designs, or a selection of them, to a professional adviser of large experience in this class of work, and by so doing secure the approval of all honest competitors.—I am, &c., A COMPETITOR.

STAINES TOWN HALL COMPETITION.

SIR,—It really seems to me that this competition should be inquired into by the R.I.B.A., as the profession are asked to compete for £100, which, so far as I can see, means $2\frac{1}{2}$ p.c. on what, taking the conditions as to requirements, must at the lowest estimate be the probable cost of the building. This barefaced attempt to publicly reduce the usual commission should, at any rate, be treated as it deserves to be, by no one competing, and I cannot fancy anyone who cares for his profession will do so on such terms. I hope an example will be made of this "generous" Local Board.—I am, &c.,

DO AS YOU WOULD BE DONE BY.

NEWARK HOSPITAL COMPETITION.

SIR,—I shall be glad if you can find space in your valuable journal for a little comment upon the plans in this competition.

I wish to do so simply because I am (with one exception) acquainted with the whole of the competitors, and have been over to Newark and spent several hours in consideration and examination of the designs; but have not been dodged by any one competitor "extolling the merits of his design," or "picking holes in the others."

The committee have, I think, acted very wisely (if it is correct) in calling in professional advice—such advice simply to be upon the merits of the plans as they are, irrespective of cost or architectural display, and reserving to themselves the right to award the prizes as they may think fit after getting such opinion and advice. Your correspondent Mr. Heyward is very sore upon this point.

There is, I think, a great advantage in their arrangement, having got in designs which (with one exception) will cost double the amount proposed to be expended. These cannot meet with the approval of the committee as they are, and professional advice as to the best-arranged plan, and a judicious pruning down of the two costly elevations might bring them a building fairly within the scope of their requirements and their instructions to competing architects.

Elaborate and artistic perspective views are shown at these competitions which do not really represent what the building will be when completed. A good example of this we have in our university buildings in Nottingham, now being completed. The perspective design would certainly not know the offspring from it if now introduced to the building as erected, so much docking and curtailing having taken place. So much for elaborate perspective.

As I before stated, there can be no doubt that, with one exception (that of Messrs. Evans and Solly, in which economy has certainly been considered), any of the designs carried out would cost nearly double the sum (£3,300) proposed to be expended.

The competitors have no doubt to some extent considered what the requirements of the committee were as far as accommodation goes, but have been completely at sea as to the cost, and have allowed themselves (as is the common practice in competitions) to be carried away with an elaborate and unnecessarily expensive elevation—not thinking of the cost until they come to cube up the building, when the cost per cube foot will be 4d. or 6d., as may be, to make up the sum intended to be spent.

There need be no wonder at one of the competitors having, in the opinion of many good judges, the best-arranged plan, because he has all the advantages of the constant intercourse and communication with the authorities whose wishes and arrangements have to be provided for; and there can be no doubt also that his plan, especially No. 2, will, with the exception named above, be the least expensive one. It will not do, pending the judgment, to comment too much upon the merits of the plans; but I may say that one set has a most artistic perspective drawing, another is a very bad illustration of Queen Anne style, while a third closely resembles — although on a small scale — the Norfolk and Norwich Hospital, illustrated in your paper in June last. The remainder are so far removed from high-class that it would be almost unkind to comment upon them. Apologising for the length of this letter,—I am, &c.,

Nottingham, Sept. 24. Looker-On.

MANCHESTER TOWN HALL PAVEMENT.

Sir,—In the review of Mr. Henry Reid's recently published work on "Natural and Artificial Concrete," in your current issue, you refer to "the pavement of the Manchester Town Hall, executed by Messrs. Patteson, of that city."

You are in error in making this statement; the work was not done by us, nor were our marble mosaic tiles, to which Mr. Reid refers, used there. On reference to the article, you will find that the author was advocating the superiority of tiles in which Portland cement was used "as the matrix of concretion" to the mosaic tiling of the Italian kind, where a cement is employed which "requires to be quick in its initial set, and, owing to such necessity, is composed of such ingredients as will prevent its reaching any very high point of ultimate induration."

In order to prevent any misunderstanding, we shall be obliged if you will insert this correction in your next issue.—We are, &c.,

J. & H. Patteson.

Stone and Marble Works, Oxford-street,
Manchester, Sept. 22.

NEW PREMISES IN FLEET-STREET.

Sir,—In your issue of the 19th instant, remarking on your lithographic illustration, you state the dressings of the new buildings in Fleet-street are Dumfries red stone. This is a mistake; the dressings are red Corsehill stone, supplied by myself.

Red Corsehill stone is a much finer-grained stone than Dumfries red sandstone.

If you will kindly note this in your next issue I shall feel obliged.—I am, &c.,

Samuel Trickett.

Victoria Stone Wharf, Millwall, Sept. 23.

HORSESHOE ON CROSS.

Sir,—If the Rev. Alfred Earle, whose communicate to the *Guardian* you quote on p. 355, happens to have a Greek Lexicon (or Testament) at Fovant Rectory he will probably find in the last letter of the Greek alphabet an explanation of the "horseshoe" which he has discovered in the centre of the cross on the south aisle gable of St. George's church; and it is not unlikely that on the other side of the same cross, or on the outer face of some corresponding symbol on the building, he may find the *first* letter of the same alphabet occupying a like position.—I am, &c.,

20th September. H. P. H.

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A meeting was held under the presidency of Lord Wrottesley, at the Salt Library, Stafford, for the purpose of founding an archæological society for the county of Stafford. The objects of the society were explained by the Hon. Col. Wrottesley, who said it was intended to publish by instalments with each of the annual *Transactions* a portion of the many volumes of county records compiled by the late William Salt at enormous expense, and still left in MS. The proposal was approved, and the council, editorial committee, and officers of the society were elected.

Intercommunication.

QUESTIONS.

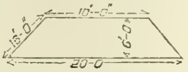
[5899.]—**Concrete Cistern.**—I have recently had a concrete cistern fixed in a currier's shop for steeping and boiling leather. The sides and bottom of the cistern discharge little black spots, about the size of a pea, which stain and damage the leather. We have tried to boil them out, but with no satisfactory result. I shall be thankful to any one who will be kind enough to inform me of an effectual remedy.—W. H. H.

[5900.]—**Drain.**—Last summer a drain of about 1,000 yards in length was cut to dry a moss. It was laid with 18in. and 15in. spigot and faucit glazed pipes. The gradient was 1 in 140 for lower half and 1 in 300 for upper half. The depth varied from 10 to 16ft., and the bottom was so soft and charged with water that only one pipe at a time could be laid, and that with so much difficulty that the work had almost to be abandoned. The joints were clayed as well as could be done. Manholes were built at from 60 to 80 yards apart. Being a dry year it was got finished and run well till latterly, when it was found that many of the pipes were broken. The water seems to run outside of the pipes and washing away the sand from the sides, the pipes, having no lateral support, get cracked and broken by the weight above. The pipes were got from two makers, and those best burnt and glazed were found to be mostly whole. We are replacing pipes where required, and putting in turf and moss alongside the pipes instead of the sand as at first. I have not heard of any drain at such a depth in running sand, and will be glad to have any reader's experience of similar work. I am anxious to learn also if there be a probability of the drain keeping good without further extensive repairs.—Enquirer.

[5901.]—**Hall Floor.**—I am laying a pitch-pine floor, and shall be glad to know the best way of treating the surface.—H. B.

[5902.]—**Formulæ.**—I should be glad to know of a concise treatise on the method of working out the formulæ given in Hurst's "Architectural Surveyor's Handbook," having a very crude knowledge of mathematics.—R. W. P.

[5903.]—**Measuring Slating.**—I should be obliged if any subscribers in different localities would give the different methods of measuring slating in practice as regards the following hipped roof covered with countess slating.



My method of measuring, which is the same as given in most text-books, is to take the nett size of slating, to which I add 20ft. by 9ft., the amount shown on bottom course, and 6in. cutting for each side of hips. A friend contends this is wrong, and that the custom of some London slaters is to allow 6in. at both eaves and apex, but agrees with me in the cutting to hips. Can anyone inform me if this is carried into practice, or if in any localities an allowance is made for straight cutting to gables, &c., running at right angles with eaves?—Port Madoc.

[5904.]—**Plaster Casts.**—Would some reader kindly give me a receipt for taking plaster casts by the gelatine process?—Pug.

[5905.]—**Blistered Painting.**—Could anyone inform me of a preparation of paint or varnish or any other means to prevent the paint of a door from being blistered and cracked by the sun's rays? The door faces the east, and although painted annually gets quite unsightly in a short time.—J. C.

REPLIES.

[5787.]—**Strains on Collar Beam Roofs.**—"H. A." has evidently forgotten what I did say about the collar. I said that it ought to be in compression, and that the walls ought to be strong enough to resist the force of the roof load received on the walls at the plate level, and quoted a failure through the "false economy or the ignorance of the designer," and "H. A." then was the first to make "unbecoming remarks" about the "mere practical man designing such roofs" or I should not have made any "invidious comparisons," which was not intending to apply generally but exceptionally. He now follows up by saying that I must be either "workman, foreman, or clerk of works, and least likely of all a contractor." Well I am not one of these three last-named. If I had taken less interest in the present and similar subjects and paid more attention to that which contractors usually do, that is, finance, I perhaps might have been as fortunate as other members of the family, but I am still only workman with my nose very close to the drawing board all day long, and use such tools as "H. A." is accustomed to. I have perhaps designed and superintended the carrying out of as many and as difficult works as the majority of my compeers at my age. I thought my last was clear enough about the overturning of wall, without illustration on paper. I think it will be understood to have the same results as "H. A.'s" sketch shows. I don't see how 35cwt. at a ridge can have a thrust horizontally of the same weight at an angle of 45°, but we shall have only 25cwt., that is if load is applied at the ridge, but if it is distributed over the rafter it will be under 9. Now, if we build buttresses to this wall 9in. projection from the face of wall opposite each principal we reduce the power from $\frac{W}{16}$ to $\frac{W}{7}$, which is quite enough to resist the horizontal force exerted by the roof load. The thrusting of plates off the wall will take more than two-thirds if bedded and beam filled above. The coefficient of friction of repose wood on stone is ·60 without bedding in mortar. In closing my part of the correspondence on this question I would ask "H. A." why do they put buttresses to the aisle walls and flying buttresses to nave walls if the collar would answer the same purpose, for I take it that they are of some support to all church walls where used, and not merely for artistic appearances.—B. S.

[5888.]—**Minutes.**—Will you kindly allow me to write a few lines in your valuable paper to give a definition of the word "module"? In your "Intercommunication" column of the 12th ult., "Star" asked for an explanation of the word "minute." I have no doubt that the subjoined will be of some use. Architects usually chose the diameter or semidiameter of the bottom of the column for their module, and this they subdivide into parts or minutes. "Vignola" divides this module, which is a semidiameter, into twelve parts for the Tuscan and Doric, and into eighteen for the other orders. The module of Palladio, Scamozzi, Cambray, and others, which is also the semidiameter, is divided into thirty parts or minutes in all the orders. Some divide the whole height of the column into twenty parts for the Doric, twenty-two for the Ionic, twenty-five for the Roman, &c., and one of these parts they make a module to regulate the rest of the building by. But the little module, taken from the third of the diameter of the lower part of the column, has uses far more extensive, for by this the height of pedestals of columns and entablatures in all the orders are determined without a fraction, as then the great module or diameter of the column has sixty minutes, and the mean module or half the diameter has thirty minutes. The little module, or one-third the diameter, has twenty minutes.—C. E. Cackett, Exeter.

[5892.]—**Coating for Plaster.**—A thin coating of Parian cement, or even a wash of this material, would meet the requirements of "G. P. B."—C. W.

[5894.]—**Surveyors' Charges.**—See Spon's "Architects', Builders', and Contractors' Pocket Book for 1879," page, 173-4.—C. E. C.

[5895.]—**Sewer Gas.**—The smell from sewer gas usually determines its presence in w.-c.'s, &c. The examination should be made after having been at least 15 minutes in the open air. If a small quantity of ether is introduced at or near the bottom of soil pipe the source of leakage can easily be detected.—C. W.

[5896.]—**Concrete.**—To allow for ramming, shrinkage, and waste, about 1½ cubic yards of the materials are required to measure a cubic yard of concrete *in situ*. With 6 of gravel to 1 of cement this would equal $1\frac{1}{6}$ cubic yards of gravel and $\frac{1}{6}$ of a cubic yard of cement. The sand should be equal to about $\frac{1}{3}$ the bulk of stone or sufficient to fill all voids. This is best ascertained by measurement as follows:—Screen from sand sufficient of the gravel to fill a bucket. Fill in water until it reaches the surface, then remove the stones. The water left will represent the bulk of voids.—C. W.

[5896.]—**Concrete.**—One yard cubic of gravel and from 3 to 3½ bushels of cement. The materials laid dry would measure 30·8511ft. (3½ bushels), but as cement when mixed reduces the bulk about one-third, the interstices will easily take up the remainder.—G. B.

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STATUES, MEMORIALS, &c.

A German National Memorial.—Soon after the Franco-German war some enthusiastic Teutonic patriots conceived the idea of erecting a national memorial which should symbolise the victory. It was decided to erect it on the Niederwald, near Bingen, where it should tower as an emblem of Germany's perpetual lordship over the national river. The celebrated sculptor Schilling, of Dresden, was charged with executing the work. He had some months ago completed his gigantic model of the "Germania victrix," and some days since all the parts of it were conveyed from Dresden to Munich for casting. They occupied eight goods waggons of the railway. The statue will be 10 mètres (32ft. 9in.) in height, which is, however, little more than half that of the "Bavaria" in the Theresa Meadow, near Munich, which is 19 mètres high. The casting will be made in the Royal Bronze Foundry at Munich, and will take from two and a half to three years. It is estimated that over 500 centners of metal will be required.

Leicester.—On Wednesday, the fountain which has been erected in the square opposite the Town Hall was unveiled. Mr. Hames, the architect of the Town Hall, prepared the plans for the fountain, which is erected in a basin, 30ft. in diameter, and 2ft. 6in. deep, formed of blocks of Shap granite, 14ft. in length, and lined with white glazed bricks. A light iron railing runs round, supported by eight polished Ross of Mull granite pilasters. The structure itself is of cast-iron, bronzed, and stands on a rustic Ross of Mull granite base, 3ft. thick, the total height being 23ft. 6in. It is in 18 pieces, and weighs nine tons. Four Assyrian winged lions are represented as crouching on the base, and supporting fluted pillars and capitals, at the summit of which is the central basin, 9ft. in diameter. A centre piece supports the smaller basin, which is 5ft. in diameter, and in the centre of which a cluster of bulrushes is fixed. The ironwork of the fountain was cast in Paris.

The Late King of the Belgians.—A memorial of the late King of the Belgians has been placed by the Queen in St. George's Chapel, Windsor Castle. It is a white marble statue sculptured in the *atelier* of Mr. J. E. Boehm, the figure of King Leopold being rather larger than life-size. The King is represented wearing his robes, which are decorated with the badge of the Order of the Garter, with star on breast, sword by his side, and holding a sceptre in the left hand. The statue is raised upon an ornamented pedestal of white veined marble with porphyry base, and upon the front there is a tablet bearing the inscription.

WATER SUPPLY AND SANITARY MATTERS.

Annan, N.B.—A special meeting of the Annan police commissioners was held on Monday week, to receive a report as to a source of water-supply, prepared by Mr. Gale, C.E., of Glasgow. The report dealt with the five following proposed sources of supply, all furnishing water by gravitation, and estimated as for a service of 100,000 gallons per day:—Dalton Burn, £11,198; Sinclair Burn, £11,515; Middlebie Burn, £10,006; Mein Water, £11,531; and Kirk Water, £13,363. For a service of 150,000 gallons a day the cost would vary from £12,100 to £14,945. The report recently received by the police commissioners from Messrs. J. and A. Leslie, civil engineers, of Edinburgh, recommended pumping the supply from the river Annan, but Mr. Gale reported in favour of some gravitation scheme. A decision has not yet been arrived at by the commissioners.

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LEGAL INTELLIGENCE.

Alleged Dangerous Structures in the Haymarket.—At Marlborough-street police-court, on Friday, a series of summonses against the owners of Nos. 27, 28, and 29, Haymarket, and 1, Arundel-place, alleged to be dangerous structures, were gone into before Mr. Mansfield. (The case against Mr. Fagg, the owner of No. 29, Haymarket, for having a dangerous arch, 8ft. wide, resting on a 4½in. wall, alleged to be old and rotten, had been heard on the 3rd September, when it was dismissed by Mr. Mansfield, on the ground that, though it was dangerous ever to have erected such a structure, yet, being shored up, it was safe. The district surveyor, finding the shores were loose, and being dubious as to their strength, had since given a new certificate to the Board of Works to serve notice on the owner to take down the insecure and dangerous wooden props, and all dangerous work connected therewith. The summons also included a certificate as to the dangerous upper portion of the party-wall between 28 and 29, Haymarket, and other dangerous parts of same.) Mr. Grain appeared on behalf of the Metropolitan Board of Works; Mr. Green appeared for Mr. Fagg, the owner of 29, Haymarket; Mr. Tatlock for the Civil Service Stores (28, Haymarket); and Mr. Houghton for Messrs. Kirk and Randall, contractors for No. 28, Haymarket. The first summons taken was that relating to the party-wall between No. 27, Haymarket, and 28, which has been pulled down. Mr. Robert Walker, district surveyor of St. Martin's-in-the-Fields, deposed that the wall was dangerous, having cracked, and said that the magistrate had already ordered part to be removed. Mr. Mansfield granted an order to take down within four days against the owners of both 27 and 28. No. 1, Arundel-place was next taken, and as to this photographs were produced by Mr. Walker, who said that the wall in question was only kept in position by 3in. of rotten brickwork. A similar four days' order was granted. The third and principal case, that as to party wall to No. 28 and 29, and a projecting vault belonging to 29, was then re-heard. Mr. Grain explained that the vault abutted on an old chimney-stack on No. 28, which the magistrate had already ordered to be taken down as dangerous. The contractors, Messrs. Kirk and Randall, had commenced to obey this order, but the men refused to remove the lower portion of the stack, as they feared the vault would fall upon them. The outer walls of this vault were but 9in. thick; and on one side only 1½in. They rested on a loose ballast foundation, and were only held in position by the old stack. The arch of the vault was but half-brick thick, with scarcely any mortar, and part of the wall beneath was of loose bricks held together with mortar on one side. He trusted Mr. Mansfield would not be influenced by anything which might have appeared in the newspapers, but would deal with the case on its merits; and he earnestly requested him to visit the buildings and see for himself before coming to a decision, a plea in which the other counsel engaged joined. Mr. Mansfield said he would visit the buildings that afternoon at the close of the hearing. Mr. R. Walker, district surveyor, produced plans, sections, and photographs, and deposed that the party wall at the rear of the vault was exceedingly dangerous, crushed and rotten, and bulged on the top story. Part of it had fallen down. There were no footings, concrete, nor foundations to the wall, which had cracked. Much of the Haymarket property was in a bad state, as the soil of the hill was of clay, with potholes of sand. From these the tenants had pumped water, which had caused the whole to slide, splitting some of the walls. As to the vault, this was also very dangerous. The arch was of 4½in. work, in red place bricks laid overhand, with mortar on the inner face only. Not only could it not be built against, but if the base of flue were removed the whole would fall, and the whole of No. 1, Arundel-place, might be heeled over thereby. Cross-examined by Mr. Green: It had needles through it, but the holes were large enough to admit a man's body, and under the Building Act he did not recognise shoring other than as a temporary expedient. True, three stories had been built over this vault and a chimney stack abutted on it, but the weight of the house rested on the haunches, and had no influence on the vault save to steady it. To Mr. Honghton: Building operations at No. 28 had been stopped, on account of the danger, for three weeks. Mr. C. Forster Hayward, district surveyor for St. Giles's and St. George's, gave evidence to the dangerous condition of the wall and vault. To Mr. Green: The haunch of arch bore weight of chimney and house. He thought that the vault might be taken down if great care were used. Mr. R. Woodthorpe, surveyor, gave similar testimony, and in cross-examination said he could not speak as to the mortar in arch of vault, as there was none to inspect. Mr. George Hall, builder, Leicester-square, corroborated, as also did Mr. Thomas Verity, architect for the Stores. In cross-examination, the latter witness admitted that he thought it would be necessary to take down the wall for the new building to be erected, but the wall was nothing like good enough for present purposes. Mr. Joseph Randall, of the firm of Kirk and Randall, contractors, said the walls and vault appeared so threatening that three weeks previously his workmen refused to go on with the rebuilding at No. 28. Mr. Lee, a clerk of works under Messrs. G. G. and J. O. Scott, and Mr. Geo. Wood, formerly principal assistant to Sir G. G. Scott, concurred in regarding the vault as very dangerous. The latter witness, in reply to Mr. Green, said of course it could be centred and shored up, but practically an arch might be hung up without any side columns or buttresses; it was simply a question of time and expense, and no wall or arch, however dangerous, need be allowed to fall. This closed the case for the Board of Works, and the case was adjourned till Saturday, Mr. Mansfield, accompanied by counsel, visiting the premises.—On Saturday, Mr. Fry stated the wall had shown extensions of cracks since previous day, and this was deposed to by Mr. Green, foreman to Messrs. Kirk and Randall. Mr. Pincher saw the wall that morning; the crack was enlarged since Friday. Mr. Lee also saw the party-wall; the crack was considerably enlarged, and there were several fresh cracks. On cross-examination, he said this was the wall of the arch. The building was gradually falling owing to the movement created by new cracks. He thought there was a possibility of Arundel-place being destroyed. On behalf of Mr. Fagg, the owner of No. 29, Mr. Bingham (who appeared in place of Mr. Green) contended that the re-hearing of this case was unnecessary. He did not understand why an order to pull down should be made now, as the circumstances were not altered since the last hearing. The learned counsel said that Mr. Walker had first offered his services to Mr. Fagg; he afterwards suggested to Mr. Fagg that he should call in an independent surveyor, and that he (Mr. Walker) should be put down as reference. The case, however, was not referred to Mr. Walker, and an ill-feeling had thereupon been created. It was stated that Mr. Walker had sketched the shores for the arched chamber on an iron door. (The door with chalk sketch was produced in court; and Mr. Green said it was his, not Mr. Walker's, sketch, but that he had suggested the shores.) The learned counsel contended that the differences must have arisen between the 3rd of September and the present. He also read Mr. Stevenson's award, according to which the building owner may raise the wall, and should rebuild such part of wall taken down and secure arch. Mr. Bingham asserted that Mr. Walker came biassed into court, and stated that the summons against Mr. Fagg was properly dismissed by magistrate. The questions for the Court to determine were, whether the party-wall was so dangerous as to require pulling down. Mr. Fagg should not be called upon to rebuild, but that the building owner should restore wall to its former state. Mr. Tatlock replied, and protested strongly against Mr. Bingham's statements. The question with Mr. Walker was one of danger, and had nothing to do with the award or the mutual arrangements of neighbours. He argued that the Stores wanted to raise the party-wall, but that on examination it was found that it was not safe to do so. The learned counsel urged that adjacent owner should pay. Mr. Fagg was next called. Examined by counsel: Mr. Walker came by request to look at wall, and did not think anything of cracks. He suggested his name should be put down for reference. Mr. Walker showed the kind of shores to be put up. On 1st of September Mr. Fagg received further notice to take down south wall; 3rd of September attended at Court about arch. Mr. Mansfield said he went to the place, and, after examining it, he considered, as one of the witnesses said, that if a tempest or anything of that kind occurred there might be danger. There were cracks in the walls, but as to the amount of immediate danger he would not like to give an opinion. Mr. C. Sewell, architect, was called. He said he considered south wall between 28 and 29 not dangerous, that it was well constructed and "sufficiently sound for all present purposes." The mortar was good; he had measured the bulging, which was about 3½in. in 30ft., which he attributed either to having been built out of perpendicular or to pressure; it was certainly not dangerous. He further said that the timbers were removed with much carelessness. The wall was three bricks thick at basement, two bricks in the middle floor, and one and a half bricks at top. He denied any indication of cracking. Mr. Sewell here produced a section of the arched chamber, and the shores he had prepared from careful measurements, which presented very different proportions from those shown in Mr. Walker's drawing exhibited to the Court. The room or chamber was less lofty, the lower part of the wall from which the arch sprang was 9in., not 4½in. as stated, though the upper portion immediately below the arch was 4½in. Mr. Sewell attributed roughness of brickwork on the outside to the removal of party wall, and said the loose bricks had merely filled up an opening that had formerly existed. The cracks were the result of mortar having come off. Mr. Sewell was subjected to a severe cross-examination by Mr. Grain, but remained unshaken in his opinion that the arched chamber was not imminently dangerous, and thought that the party wall, if it had been left, would have rendered the building perfectly secure, even assuming the old chimney-breast were taken away. He also said that if arch came down it would not endanger rest of structure. The case was then adjourned till 3 p.m. to-day (Friday).

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Our Office Table.

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The Worsted Church of Canterbury, N. H., is described in the summer correspondence of *The Boston Traveller*. The interior is a mosaic of needlework of vines, flowers, and decorations of worsted in all colours and designs. Crocheted lambrequins cover the curtains at each window, and baskets filled with zephyr wool flowers hang from the centre. Harps, crosses, anchors, wreaths of flowers and festoons of vines are placed between large tablets of artistic designs gracing the walls like ancient tapestry, and inscribed with Scriptural selections. These tablets and inscriptions are composed of various coloured crimped tissue papers upon a background of cloth. An immense ornament of flowers and drapery is suspended from the centre of the ceiling with two large arches of flowers spanning the interior of the church. The flowers look so fresh that the beholder is almost tempted to pluck a regal lily, a blushing rose, a radiant dahlia, a modest forget-me-not, or the lily of the valley with its fairy bells. "Who has done all this work?" admiringly asked our Transatlantic contemporary. A young widow, who made a work-room of an apartment near the entrance of the church, and who not only decorated the walls during the week, but conducted service every Sunday for five years, reading Mr. Beecher's sermons from the pulpit.

Mr. Frederick Ransome, after an extensive series of experiments, is stated to have produced a new cement which is perfectly white, and, in addition, possesses a strength greater than that of Portland cement. Although the new cement is colourless in itself, it is capable or receiving and retaining any tint that may be imparted to it, which is a valuable feature. In his early experiments Mr. Ransome produced excellent results by substituting washed kaolin for the alluvial deposits of the Thames or Medway which are used in the manufacture of ordinary Portland cement, and by burning the slurry in retorts or muffles, so that the material was protected from the direct action of the heated products of combustion. Although the results were perfectly satisfactory in a scientific point of view, they were hardly so commercially, as the cost of the cement promised to be excessive, and thus to limit its application to very special purposes. Further search for a supply of silica and alumina in favourable conditions for his purpose led Mr. Ransome to experiment with blast-furnace slag. By its aid he has now fully succeeded in effecting his object, and has produced eminently satisfactory results. In making this cement the slag is first granulated or reduced to sand, which is easily reduced to a very fine powder, and is then mixed with from one to two parts by weight of chalk or limestone, and burned at a moderate temperature. The result is said to be an excellent hydraulic cement, possessing great strength, and having a pure white appearance.

Last week the members of the Rochdale Art Society held their first exhibition of pictures, in a very suitable room of the Public-hall, Rochdale, and the collection was numerous and creditable to the amateur exhibitors. This society was only formed in October last, for the purpose of encouraging art, and the members meet fortnightly to suggest subjects, and monthly meetings are also held to criticise work. The exhibition held last week was confined to amateur artists residing within nine miles of Rochdale. Miss M. T. Bright, Mr. John Bright's youngest daughter, has contributed four water-colour pictures of flowers, some very nicely worked out. An alderman of the borough, Mr. W. T. Shawcross, has also produced some creditable pictures in water-colour during his leisure. Mr. R. Glazier has a large number on view. Miss Louisa S. Cook, the daughter of the Rev. Canon Cook, of Smallbridge, also exhibits.

According to the *Weser Zeitung*, the bridge over the Rhine at Wesel comprises 107 arches or openings. Of these there are four in the centre of the stream 313ft. wide, the less considerable including 35 of 60ft. each, six of 61ft., 14 of 40ft., 18 of 12ft., 10 of 20ft. and 20 of 30ft. The total length of the bridge or viaduct, including the part on piles, is therefore, 6,220ft., or 1,952 metres. The elevation above the level of the sea of some of the chief railways of the world out of the British Islands is as follows:—The Apennine line at its highest point is 617 metres above the sea level, the Black Forest line 850 metres, the Semmering, 890, and the railway over the Caucasus 975 metres. The tunnel of the St. Gothard line attains an elevation of 1,154 metres, the Bremner line 1,367, and the Mont Cenis line 1,338. In America the highest lines are the North Pacific, which at its most elevated point is 1,652 metres above the level of the ocean, the Central Pacific 2,140, and the Union Pacific 2,513 metres. The highest point of the railway over the Andes is 4,769 metres above the sea-level.

The Sydney Exhibition was opened on the 17th of the present month. The machinery in motion department is not yet completely ready, but the preparations are on a great scale, and there is every reason to believe that this department will be of much interest and practical use. The pottery and glass section is very good and extensive. There are 800 British Industrial exhibitors and 513 fine art entries, including photographs. Germany has 695 entries, including 108 fine art; Austria, 170; France, 350 industrial and 168 fine art: Belgium, 236 industrial, and 50 paintings. America has 150 industrial collections. Among the best filled sections are railway apparatus and material, steel and cutlery from Sheffield, guns and miscellaneous manufactures from Birmingham, Manchester goods, sewing cottons, cloths, hats, indiarubber manufactures, chemicals, preserved foods, lamps and stoves, paper and stationery. The British Government collections comprise those of the Admiralty, Science and Art Department, and the School Board for London. The paintings include those lent by the Queen and Prince of Wales, and by the Society of Arts. There are 175 British oil-paintings, 111 water-colours, and 97 architectural drawings.

Messrs. R. W. Winfield and Co., of Birmingham, have just completed the first two of five massive chandeliers destined for the illumination of the reception-rooms of the new Council House in that town. In accordance with the free style of decorative treatment which prevails in the interior of the building, the designs are of a composite character, blending with the curvilinear outlines appropriate to a classical edifice a modified form of Gothic ornamentation, in the style popularly known as Victorian. The chandeliers, which are corona-shaped, are constructed for eighteen lights, in pyramidal clusters of three, and are fitted with Sugg's patent burners of sixteen-candle power, each with opal globes, resting on winged brackets. The leading constructional lines are of brass; the foliated ornament is of grey or steel bronze, delicately shaded by brushing off the steel-grey bronze from the projecting surfaces; the flowers and cusps are of beaten copper, and some of the inner lines and framework are of the same metal; and the harmony of varied metallic surfaces is further relieved by settings or jewellings of Derbyshire spar, and red-stained ivory nuts for the stamens of the flowers. The weight of each chandelier, exclusive of the ceiling ventilation, is about 5 cwt.

Just now, when attention is being so generally given to the provision of open spaces and the general improvement of the appearance of the metropolis, and when it has been shown, in the case of St. Paul's, how easy it is, at a comparatively small outlay, to make ornamental a place which was previously an eyesore, a correspondent of the *Times* trusts that some attention will be given to the space on the north side of Westminster Abbey. Here there is a very considerable piece of ground which in fine weather resembles a sandy waste, but which in wet weather is more like the bed of a river at low water. There is no proper footway across, and any one who ventures to cross is obliged to leap over the puddles from tombstone to tombstone to avoid getting his feet wet. Very great improvement might be effected here at no great cost by laying down turf, making one or two footpaths, and planting a few trees and shrubs. If a new railing could also be provided this would be very desirable. In no other city in England would such an approach to its cathedral church be tolerated.

The lectures on architecture and construction at the University College have usually been delivered by Prof. Hayter Lewis, F.S.A., who for so many years has been connected with architectural education, much to the continued advantage of students. This year, however, the professor has obtained leave of absence of the council of the college, and Mr. T. Roger Smith is announced to deliver the usual series of lectures and conduct the classes. The two series are divided as A and B: *A*, "On Architecture as a Fine Art"; and *B*, "On Architecture as a Science." These lectures are delivered every Tuesday evening, and each course consists of 30 lectures of two terms of 15 lectures each. Beyond these, Mr. Roger Smith has arranged to deliver an extra course of lectures "On Modern Practice," on not less than 15 successive Monday evenings, from 6.15 to 7.15.

Mr. C. Sadd, of Duffield, Derby, has invented a very ingenious mode of finding the weight of bolts and nuts, that will be received by all practical men, especially engineers and architects, with satisfaction. In the preparation of estimates and specifications for ironwork, &c., the frequent want of an easy mode of calculation is obvious, and cannot be better met than by reference to a diagram that can be hung on the walls of the office or easily read. Mr. Sadd's method is a graphical one. The diagram consists of a series of lines at right angles, the horizontal ones showing the weight in lbs. and decimal parts, and the vertical ones corresponding with the length of bolt in inches. Across these are diagonally-drawn lines, which represent the diameter of bolt. Let us suppose it is required to find the weight of a bolt 1in. diameter and 9in. long. We find the diagonal line figured 1 on left margin, and next the vertical line marked 9 at bottom the length of bolt; then the intersection of these lines we find to be about one-tenth higher than the horizontal line marked 3, which shows the weight to be 3·01, or a fraction over 3lb. The numbers are repeated at each side of the diagram. We cordially recommend Mr. Sadd's table as a very reliable one, and we hope some day tables of this kind may be constructed to show the weights and strains of girders and roofs.

The *St. Petersburg Herald* devotes an article to an enumeration of the advantages likely to accrue to Russia from the proposed connection of the Sea of Azof and the Caspian by means of a canal. A large number of foreign products would also be able to reach the Volga district much more cheaply than at present. Morever, with the prospective connection of the Caspian with the water system of the Aral Sea, either by the diversion of the Amu-Darja into its old bed, or by a direct canal joining the northern portions of the Caspian and the Aral, a direct water communication through Russia between the Mediterranean and the heart of Asia would be established. An effect almost equivalent to a revolution would thus be produced upon Asiatic trade, and the political assimilation by Russia of her Central Asian conquests would be greatly forwarded. Amongst the merely local advantages which would result from the Azof-Caspian canal would be the regular irrigation and drainage of districts which under existing conditions suffer much from drought and untimely floods. As we announced some time since the Russian Government has instructed the engineer, Mr. Daniloff, who has submitted a proposal on the subject, to make further inquiries into the geological structure of the district, and four Government Commissions are also on their way thither to investigate.

The following startling facts, says the *American Builder*, are clearly proved by the reports of the American Consuls resident in the chief European towns:—1. That wages in the United States are double those of Belgium, Denmark, France, and England; three times those of Germany, Italy, and Spain; and four times those of the Netherlands. 2. That the prices of the necessities of life are lower in the United States than in Europe, and that the labourer in the United States, were he satisfied with the scanty and miserable fare upon which the European labourer must live, can purchase the food for less money than it can be purchased in Europe. 3. That the French working people, with far less wages, are happier than the working people of Great Britain, who receive the highest wages in Europe, on account of the steadiness and economical habits of the former, and the strikes, drinking habits, and consequent recklessness of the latter.

The trustees of the British Museum seem inclined to give students, if possible, the advantage of a longer day in the reading-room than can be commanded under the present regulations, which exclude the use of artificial methods of illumination. The trustees in the earlier part of the year instituted a five or six days' trial of the electric light, distributing a dozen standard burners in different parts of the reading-room. The results on the whole were not thought to be sufficiently encouraging, and there seemed a disposition to allow the matter to drop. Now, however, it is intended to take advantage of the usual closed week, which commences on the 1st of October, to repeat the experiment, but with the difference that this time there will be one large "sun-light," which will be suspended from the centre of the dome.

A few days ago there was found near to the Loch of Hennis, in the vicinity of Maeshowe, Orkney, two very ancient gold rings. A farmer was engaged ploughing, and a boy following him picked the rings out of the furrows, and carried them about as toys for some time before their real value was known. The two rings were clasped together with a solid piece of gold, made in a sort of band or hook form to overlap the edges. The rings are three-quarters of an inch in diameter, inside measurement, and along with the band weighing 1oz. 8dwt. One is very intricate, three-cornered plait patterned, and the other a plain double cord. The articles are in a perfect state of preservation, and looked as if they were fresh from the hand of the workman. It is thought by local antiquaries who have seen the rings, and judging by the patterns and workmanship, that they must be at least a thousand years old, and it is considered one of the most valuable finds that have been made in Orkney. The rings have been handed over to the county clerk, at Kirkwall, as treasure-trove.

CHIPS.

The School Board for Landrillo and Eirias last week adopted plans and designs for a new school, prepared by their architect, Mr. Richard Davies, of Bangor.

The memorial-stones of a Wesleyan Methodist Chapel at Stone were laid last week. The style adopted is Early English, and the materials used will be almost exclusively brick. Accommodation will be provided for 300 persons, and the cost of the building and site will be about £1,200. Mr. T. Roberts, Trentham, is the architect, and Messrs. Jukes and Weston, Longton, the contractors.

On Monday afternoon the garden at the eastern end of St. Paul's Cathedral, which has recently been laid out under the supervision of the Corporation, was opened by the Lord Mayor. The expense of the work has been about £5,000, which has been borne by the Corporation, and among the improvements in the churchyard have been the setting back of the rails on the south side to afford a "refuge" from the road (the excavations in connection with which alteration have revealed some relics of old St. Paul's, including part of the original Chapter-hour, and a pier of the old Church of St. Faith), and the planting of the beds in the grounds with laurels and other evergreens.

It has been decided to restore the fine Norman church of Hartshead, near Clifton, in the West Riding of Yorkshire. The work is to be carried out under the superintendence of Mr. W. S. Barber, of Halifax.

THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 3, 1879.

BRICKS—IN HISTORY.

MARBLES and granites, and stone in every variety, have constituted, of course, the foundations and materials of all splendid architecture; but bricks, nevertheless, have filled an important place in building history. From those of Assyria, famous for its clay, to those of Italy, with which the porte of Trajan and the citadel of Ostia were chiefly constructed, they have been in perpetual request, sometimes alone, sometimes in association with other materials, as in the great works of Constantine, at Byzantium and Rome, where they alternated with more natural masonry, and as also in Tuscany, ancient Bavaria, and the South of France. It is curious that the Romans, perfect masters though they were of their fabrication, disdained their employment for any except the humblest purposes, and that, during their domination over Britain, the brickmaker's vocation, unless for baths, basements, and so forth, was almost entirely gone. So with the French; they have never appreciated the value of brickwork in an equal degree with the Germans, who, practically speaking, possess no marble, or even the Italians, who, of course, possess it in abundance, and yet use the inferior substance largely, with a view to decorative variety and colour. It may be said of the Germans, in fact, that, at Munich, Carlsruhe, and Berlin they have brought the manufacture to perfection, and the Russians are following close upon their improvements, especially in their southern provinces, where the fabrication of hollow bricks represents a special branch of industry, supplemented by various processes of colouring, polishing, and even varnishing over with a cheap species of enamel paste, though the Russians do not carry their refinements in this direction so far as to cut their bricks in two and make mosaics of the roughened ends. In all respects, however, the brick-manufactory of the Northern Empire, celebrated for centuries past, is of extreme interest. Its products are of marvellous solidity, capable of resisting any degrees of damp and cold, of sustaining enormously heavy roofs, and of withstanding the most violent alternations of temperature. When the wooden parts of the structure have been, as so often occurs in that region of conflagrations, devoured by fire, the bricklayer's work is generally found to have remained intact, and, as a rule, habitations thus constructed are dry, warm in winter, cool in summer, and at all times healthy. The Russian brickmaker, in selecting his materials, rejects all earth containing more than a certain proportion of sand; he employs, moreover, a particular amount of vegetable substances, such as old straw, hay, or even fresh grass and leaves; he spares himself no trouble; and he coats his hollow bricks with hot oil or wax, or a mixture of these with wood ashes, until they become absolutely waterproof. But, not to follow him through all his manipulations, one example may be cited of his success. In 1838 there was erected, on the shores of the Black Sea, an immense array of structures—farms, stables, granaries, a mill, and a church. Two or three years later the whole south of Russia was convulsed by a violent earthquake, shifting the surface of the soil to the extent of at least five or six inches, and yet not one of these Russian-built edifices showed a fissure in its walls. The Romans possessed the same art, though they often affected to despise it; but they discovered in England a material quite equal to the Russian, and, during the five centuries of their ascendancy, put its durability, at any rate, to the proof; while, after their departure, ages elapsed before it was again employed in the national architecture. Some affirm, indeed, that it was only reintroduced by the Flemings. However this may be, it is positive that the industrious emigrants from the Low Countries did rear for their factories and marts a great number of buildings in this country, which were composed almost entirely of brick; that stone and wood at that period had begun to grow scarce, and that an immense accumulation of brickwork in every shape had commenced in London. Strangely enough, it was not until three hundred years later that a similar change began to manifest itself in the capital of France. When the French Government had conceived its gigantic plan for the fortification of Paris, and still later on, when the Imperial improvements were undertaken, the cost of stone rose in an inordinate degree, and builders resorted to brickwork for at least the internal parts of their constructions. The Italians, notwithstanding the wealth of their quarries, have always appreciated this material for the sake of the effects it is capable of producing; and the Tuscans, above all, have put it to beautiful uses. While the Parisians plastered the Italians polished, and there can be no question as to the difference between the artistic results. But the French to this day have never comprehended the proper methods in brickwork, and have still to take lessons from their Belgian, Dutch, and English neighbours. They are themselves conscious of this truth, and a prize is annually given at Paris for improvements in the process. Yet the noble Hotel de Rambouillet, with its niches, friezes, cornices, architraves, and pilasters, was a brick structure, though ornamented with stone, as were, again, the Palaces of Versailles and Fontainebleau—the latter the Hampton Court of France—the Hotel de Mayenne, and the old Palais Royal. "The redness of the brick, the whiteness of the stone, the darkness of the slate," it was said, "made up the finest combination in the world," and the palace of the Quai D'Orsay was, no doubt, a remarkable example of the kind. We find numerous attempts at harmonising the rich tints of which baked or burnt clay is capable with the warm natural colouring of the tropics; but, so far, brick constructions have not answered in those regions, except, perhaps, in Brazil, where it has been noted a clay exists almost precisely identical with that which was used in the antique palaces of Assyria. In the Central and South American territories, however, the secret has not been discovered, to which reference has already been made, of the South Russians, who construct an edifice of brick capable of withstanding an earthquake-shock. The Spaniards tried this in Manilla, but failed, and had to fall back upon timber edifices, deeply planted on piles, and only one story high.

This manufacture, of most remote origin, known, indeed, in the days of the Egyptian captivity, and traced to traditions far beyond even that, has assumed a great variety of forms, and yet, taken for all in all, the shape of a brick has been pretty much the same in every country and age, from Babel to the historical patents of Conrad and Adhemar, whether hollow, solid, porous, plain, decorated, or merely fantastic; whether employed in the paving of a Roman stable, in the arching of a Neapolitan bath, the lining of a Gothic chimney, the walls of the great Parisian markets, or the foundations of the vast Napoleon Hospital at Berck-upon-the-Sea, where every single oblong is stamped with the maker's name. No doubt, in the modern market various fashions and appellations are in vogue, but in a retrospect they nearly always present themselves in one point of view: the pyramid of unburnt brick, cemented with sediment from the Nile; the red and white chalky substance mentioned by Vitruvius; the Greek, which was about as long as a man's hand; those of Calensum in Spain, Marseilles in France, and Pitane in Asia, the weight of which was specifically less than that of water. These are historical, wholly unlike the trash hidden beneath plaster, of which so many myriads of our closely-thronging dwellings are composed, and which, in their turn, are wholly unlike the material employed by Jones and Wren, and which Palladio himself did not despise. It is curious to observe that in many ancient basements brickwork has been discovered of exactly the same character as that used in the Mediæval houses of the Norman town of Trepont, clay mixed with powdered sea-shells and now and then with powdered slate. An identical composition was found beneath the ruins of Hadrian's Villa, at Rome. In modern days, however, as we have hinted, the Germans have been among the greatest brickmakers of Europe. The brick is their leading architectural material, though its modern employment by no means constitutes a new style, as certain artists of Berlin would pretend, because nothing they have ever created in this way approaches Hampton Court Palace, the "Hotel of Ridicule," in Italy, or the Cathedral of Alby, in France. Still, they have undoubtedly reached a high pitch of excellence in the production of carved and moulded bricks, as at Carlsruhe, Munich, Vienna, and Berlin, where the manufacture attains to almost artistic importance, with its adaptations of colour, vitrification of surfaces, grounds for painting, and elaborations of form. The qualities claimed are—a scientific selection of clay, sand, quartz, and chalk, with a subtle mixture, for varnishing, of lead, alum, sea-salt, saltpetre — the whole resulting, however, rather in a tile than in a brick, the colouring being determined before the baking or burning is carried out, and being generally confined within a small compass of varieties—as, deep violet, pale violet, green, sky-blue, and gold-yellow. This certainly confers a characteristic aspect upon the domestic architecture of Germany, where it is not uncommon to see houses built from basement to roof—front, sides, and back, window-frames and chimneys,—in these brilliant tints; a taste especially prevalent in Baden and Bavaria. As we have remarked, while in Germany this fashion extends, among the French it has been in a considerable measure abandoned, though, during the reigns of Henry IV. and Louis XIII. brickwork stood in the highest favour, and was adapted to almost every kind of architectural form—angles of walls, embayments, window-arches, balustrades, cornices—even church towers, just as in England during the sixteenth century, and in Piedmont about the same period, where, as at Astie, several remarkable monuments of this class are extant—not to be matched, perhaps, with the grace of the cloisters at Chartreuse, or the delicacies and infinite variety of Bologna, or the perplexing riches of Milan; or, perhaps, with the splendours of the Visconti Palace at Pavia; but works of art, nevertheless, naturally created in an art-loving land which possesses scarcely any stone, though abounding in excellent clay. The vast Tuscan Cathedral of Aix, with its lofty roof, is on a par with many among the most ambitious of Middle Age edifices, belonging to the same class, and a very small proportion of stone entered into its construction. Its interior is decorated in dark colours, relieved by surfaces of white; here and there the brilliant red of the brick is left untouched; and, upon the whole, the effect is singularly imposing. It has been successfully imitated at Vienna, in a church built exclusively of white, black, red, and yellow bricks, which have lately assumed the importance of a special manufacture in that country; though the industry is, at the same time, an ancient one. The famous chateaux of Igling and Rhelingberg contained scarcely a stone in all their walls, while Heidelberg itself was of similarly composite construction, as, indeed, were, in France, both the Louvre and the Tuileries. It is somewhat surprising, nevertheless, to find that in so many monumental and triumphal columns and groups on the Continent, while their surfaces are of bronze or stone, their core, or central mass, is of brickwork, pure and simple. In not a few instances, indeed, no pretence at concealment is made, and the trophy rises in unblushing brick, as though it were a chimney-stalk of the Midlands. Of course, it is to be remarked, throughout, that brickmaking has principally, and most naturally, flourished in regions where marble, stone, and timber have been comparatively scarce. It is hardly, for example, to be met with at all in the wooded territories of Sweden and Norway. So with particular districts of France, Scotland, and England itself. But on the immense bare plains of Babylon, Egypt, and Assyria it became an early necessity of the people, and there is hardly a Book of the Old Testament in which mention is not made of this industry. Without referring again to the more classic illustrations, we have others at Padua, Morya, and Certosa, at Pisa, Ionia, Ferrara, and Venice; throughout Belgium and Holland; all more or less ancient, and all of historical interest. Some of the antique brick edifices in Amsterdam are among the most characteristic in Europe.

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STEEPLE RESTORATION.

WE published last week a letter written by Mr. J. P. Seddon to the *Times*, in which that gentleman referred to the unnecessary spoliation of one of the most characteristic steeples of the metropolis by the removal of the vases at the angles. Mr. Seddon very justly observed that their removal has denuded the design of Gibbs of features that added much to the sky-line of this fine tower of St. Mary-le-Strand; and we join in the hope that the vases will be replaced, believing it to be the duty of every generation to preserve and keep in repair features of this kind, however useless they may appear, and to replace, stone for stone, those parts of the structure as they fall into decay. There is a necessary distinction to be observed in restoration that affects the structural requirements of a building, and that affecting the purely architectural features, like a tower. If the necessities of an age require a remodelling of the interior arrangements of an edifice, we can understand why certain features should be removed or altered, but in taking down the ornamental adjuncts of a steeple we are not only altering the design, but robbing the structure. On this ground it would be justifiable to take away all ornaments as they show signs of decay, till even the orders and stories themselves, as they fall into disrepair, would be removed. Such a proceeding would be certainly destructive of all our architectural monuments, for we might justify the removal of the vases at the corners of every other steeple, even of those that now adorn the west towers of St. Paul's cathedral itself.

Fleet-street and the Strand possess in the two or three steeples which distinguish them works of especial value to the architectural student of the Revival. St. Mary-le-Strand, the steeple of which has been lately divested of its corner ornaments, is particularly interesting as an example of Gibbs' talent as architect; though Walpole has said of it that it is "a monument of the piety more than of the taste of the nation." As a design it has been described as ranking next to St. Martin's-in-the-Fields, the portico of which last was much eulogised in its day as a work that compares fairly with its great prototype, the portico of the Pantheon at Rome. Even Gwilt, whose criticism was often as ironical as it was severe, describes St. Martin's as the best in London. Gibbs' work of St. Mary in the Strand has been said by Cunningham to want massive grandeur, and to be "composed of a multitude of little parts which, though all united, and that skilfully enough, into a perfect whole, produce no impression of simplicity or true beauty." We are not disposed entirely to quarrel with this criticism. The structure, though exceedingly simple in its outlines, is not well-proportioned; its west front has a stilted appearance; the main structure, broken into two orders, is not a good example of the application of the Italian style to a church; while the steeple, though very picturesque and broken, seems wanting in the solidity and beauty of parts that characterise other London steeples. Yet, notwithstanding these faults of composition, there is a certain variety and grace of outline in it which places it above many other similar compositions. Seen from the Strand, either from the east or west, the three broken tiers or stories, with their end porticoes, have a pleasing lightness about them; the broken angles and detached Corinthian columns at the ends of each stage adding much to the variety and grace of the outline. One peculiar feature about the tower is that its sides do not form an equal square. Its fronts on the north and south present a much narrower elevation, as may be observed by anyone coming down Drury-court. From this point of view the steeple is an exceedingly graceful and picturesque object, springing out of the sombre buildings below it. Each story of the steeple is really an oblong in plan, the narrower ends being finished with porticoes or detached columns, slightly broken at the corners. It was at the corners of these stories, above the detached columns, that the vases stood which have recently been taken down. They helped considerably to ease the pyramidal outline as seen from the east or west by filling up the abrupt angles formed between the upper entablatures of the ends of each tier and that above it. The broken fragments now lying in the churchyard show that the vases were not decayed—merely honeycombed, but that the iron plugs had corroded and had split the stone. The dowels are very large, about 3in. square. The tower has suffered most on its west and south sides.

Comparing the steeple of St. Mary's with that of St. Clement Dane's, a little further up the Strand and occupying a similar position, a few interesting differences are worth notice. That of St. Mary springs out of a stylobate resting upon the western end of the main structure, just above the central pediment over the porch, but the steeple of St. Clement Dane's rises from an independent square tower at the west end of considerable height, the stories of the steeple forming not much more than a third of the whole elevation. The first story above the cornice of tower is an octagon, the cardinal sides being the widest; the angles have Ionic pilasters. Filling up the corners between tower and octagon are diagonally set bases, belonging to the podium of the order, and these carry large vases or urns of considerable size. The sides of this octagon are pierced by circular-headed windows. The second stage is also an octagon pierced by windows; but the sides are concave, and it is adorned by pilasters and entablature of the Corinthian order. Above this there is an octagon lantern. The composition is well-proportioned, the outline good, and there is a solidity in the treatment of the stages. The plain massive character of the tower, the peculiar spacing of the upper windows, and the singular buttresses at the lower angles looking more like obelisks placed against the walls, enhance the picturesque grouping and effect of this steeple. We wonder whether the same precautions have been taken as at St. Mary's, for the angles of the first and second stages are crowned by terminals which to all appearance are equally unstable upon their bases. By removing those of St. Mary's steeple the detached flanking columns look conspicuous and useless as appendages, and from our own observations much of the original charm of this structure is lost. The two steeples we have described, together with that of St. Bride's in Fleet-street, make up three types of Italian towers that for originality and invention may be compared with any of those designed by the great Italian revivalists themselves.

There is some fine carved woodwork in St. Mary's Church. The west front, a view of which was published in the BUILDING NEWS for 1876, Vol. XXX., p. 594, is remarkable chiefly for its semicircular porch, a half-peristyle of the Ionic order crowned by a flat domical roof. The windows at the sides lack solidity, and the ornament under the curved and triangular pediments is not equal to other carved work of the period. Details of this front and porch are given in the illustrations we have referred to. As the work of one of the leading Revivalists in England, and the architect of the Radcliffe Library and dome at Oxford, we should regret to see this church despoiled, as long at least as it is suffered to remain where it is.

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MOULDINGS: THEIR USE AND ÆSTHETICS.

THAT features once fulfilling a useful purpose have in the course of time lapsed into ornamental features is a fact of which the student of architecture cannot be ignorant. The history of the art affords several instances of parts of buildings that have become so far changed from their original use that we can now simply regard them as ornaments to the structures they are associated with. The battlement with which architects love now to crown the summit of their towers of course originated in the requirements of the ancient mediæval fortress. The merlons and embrasures that make so pleasing an indented parapet were actually used to cover the soldier, and to afford him a notch for the discharge of his arrows. The openings between the corbels were likewise to enable the defenders to throw down or hurl upon the besiegers stones and other instruments of destruction. The angle turret or pinnacle so frequently employed to relieve the angles of gables and towers of Gothic and Renaissance buildings had its origin in the bartizan, which was a small turret corbelled out from a wall or tower to enable a warder to see around him or scan the flanks of his fortress. The very crenelles or perforations imitate the oylets or arrow-slits used in the old system of defence. Even the buttress, the pinnacle, the penthouse, the flat roof, and parapet all had an original purpose, which in the course of ages grew obsolete, the form still remaining as an architectural feature. Ruskin says in one of his works that all architecture is characterised by uselessness, though if we are to trace back these ornamental features to their beginnings, we shall find that they were all dictated by use, and in this sense, certainly, his dictum fails. It would not be difficult to show that even such a thing as a moulding grew out of necessity at first, and became in time one of the most important and expressive features of a building. Imagine what a house or any building would be without a cornice, and can we picture to ourselves any structure that would look coherent and connected in its openings without one or two horizontal bands or strings to bind the parts together? A plain peforated wall, however well we may dispose the windows and doors, never looks better than a wall with holes in it. But the architect of the present day never omits anything; his chief fault is that he uses frequently a member he does not appear to know the exact meaning or use of. Let us take the subject of mouldings generally. We find an amount of ignorance or indifference in the use of this feature that is surprising. We have frequently observed a cornice where it cannot be of any service whatever, while the upper part of wall is left unprotected and unrelieved. In a low position, it performs the function of a mere cincture, and would have been better expressed as a string-course. The idea of proportioning a moulding to its height and position never occurs to half of our designers of the "inspired" and "cut-and-dried" schools. They profess to design by the eye merely; they reject all method and rule; they place their mouldings to "look well"; and they do not much trouble to care for their size or contour. A little consideration of the functions and artistic value of mouldings might enable one to detect their object, and begin to find out a new source of pleasure in them. We suggest the following points as desirable conditions in their design:—1, Function or purpose; 2, position; 3, height from the eye; 4, material; and 5, contour. In speaking of the first, it is clear, from what we have just hinted, that the real object of the moulding is not clearly borne in view. Its first and most important use is to cover and protect, as in the cornice of the Greek temple; it may, secondly, only serve to crown and afford shadow and relief to a wall or a column (in the last case it may be well illustrated by the capital of a column); it may form a footing, as in a base mould or plinth; and, lastly, it may be used to separate stories or define other features. Each of these functions may be found exemplified in the works of the Greek and Middle Age architects, and the moulding was never used where it could not be understood. The cymatium and corona of the cornice became at once the cover, guttering, and drip to the wall below it, the abacus and ovolo of the capital were the earliest and simplest types of the crowning member, or the expressive transition between the supported and supporting members, while the moulded base and plinth transmitted in like manner the weight of the wall or column to the ground in an easy and agreeable manner. In both the two last cases we have the idea of pressure, and the types of the simple Doric order illustrate this, at least as regards the capital; while the base mouldings found at the Erectheium and in the Ionic orders show how well the forms of the mouldings express the condition of pressure as well as lead the eye by a gradual transition from the column to the ground. The position of a moulding is almost as necessary to its proper design as its function, and here we find even graver faults perpetrated. Of course, if an artist disregards the purpose of any member of a building he can have no clear idea of its position. We may pick out a dozen new buildings anywhere in an ordinary street, and find that the class of moulding used for a string is similar or a repetition of that used for a cornice, but the chief blunder committed is in using mouldings unsuited to the point of view from which they are seen. Thus a series of mouldings only suited for a capping member is placed below the eye, the consequence of which is that no one except children and dogs can possibly see them. Of course, every moulding ought to be made suitable for its destination; a cornice should be moulded below the corona, so that its shadowed part may be relieved by reflections and half-lights, or be accentuated by dark lines of shadow or luminous lines in its prominent parts. Thus the mouldings of an ordinary cornice, if lit up by the sun at an angle of 45°, would probably show three luminous lines on its upper members: first the upper fillet would catch the sun, next the lower curve of the cyma recta, and third the lower edge of the corona or drip: the bed mouldings would be buried in shadow, but this shadow would be relieved by the ovolo and cavetto, and by the quirks between them, which will appear dark lines from below. A string-course is a band or cincture and its use is to define or mark a separation; it should have its mouldings on the face; they should be shallow, and if above the eye, the condition necessary to a cornice may be obeyed; if below, that necessary to a base moulding, where the eye may rest on well-defined members which expand gradually towards the ground as in many of the Twelfth-century mouldings. A string-course may suggest pressure, and some of the old labels and string-courses of the Mediævalists afford excellent types. The height or distance of the moulding from the eye is frequently neglected by young and inexperienced designers, the consequence of which neglect is that we often find large coarse mouldings around windows and doorways close to the eye, while the mouldings above or at a distance, like cornices and chimney cappings, are crowded with small members that cannot be seen at all. The fineness of the moulding should invariably diminish in the direct proportion of distance. The taste of the artist is often shocked by the glaring violation of this and the former rule in interior cornices. In suburban houses, these finishes to the rooms are generally regulated upon the principle that the principal apartments should have the widest cornices, and no discrimination is excreised as to scale; whether they were originally designed for rooms of twice the size and height or not, is a question that does not trouble the builder, even if the poor unlucky occupant grieves under the weight and width of a cornice that appears to crush all below it. Even in houses professedly designed by the architect, we have seen some mouldings glaringly inconsistent with the size and position of the apartments. Material is a more important condition than it seems to be imagined, and architects, as a rule, ignore this consideration woefully. We constantly see mouldings intended for stone or marble reproduced in wood. Of course, the brittleness of stone suggests mouldings that are not easily chipped; the hollows may be deep, but the angles cannot be so finely-cut without a risk, as in wood or more plastic materials. Cement and plaster dictate their own mode of treatment; the mouldings should be shallow, but they can be finer than those proper for stone. In joiner's work, the mouldings can be very fine, and it is this minuteness of treatment that renders the fine wood mouldings of the Queen Anne period so interesting. The last point relates to contour, and here the skill and taste of the artist must be exercised in the agreeable balance of the three elements, rounds, hollows, and squares; but we cannot, in a single article, say much on this head. The late M. Viollet-le-Duc observes the importance of designing mouldings on certain principles. Two conditions, he says, must be observed, the function they have to perform, and the effect to be produced in the place they occupy. A moulding is good only in as far as it fulfils these conditions. He further alludes to the material employed. "It would denote a condition of profound barbarism," he says, "to give to mouldings of joiner's work the section adapted for those that suit stone or marble—to mouldings inside a hall the section adopted to those outside it." The artists of the Middle Ages pushed the rigorous observance of principles as far, it is contended, as the Greeks. "In the Greek and the Twelfth-century architecture the moulding," says Le Duc, "serves three purposes: it either supports a projection, or it forms a footing, or it marks a height, or defines an opening. In the first case, the moulding is a cornice; in the second, a base or plinth; in the third, a string-course, a jamb or frame." These functions have typical forms or arrangements, which are sketched by the same author. The exquisite skill and refinement shown in the Greek mouldings are pointed out by Viollet-le-Duc as having been carried to perfection by the artists of the 12th century, who preferred hand curves to those struck by instrument. He describes various forms of cornices in which the contour has been designed, not only in accordance with structural requirements and position, but with reference to an exquisite sense of light and shadow and reflected light. Some of the classical mouldings exhibit a particular care to accentuate the shadowed parts by dark lines. Thus the shadow thrown by the drip was generally relieved by dark lines, or quirks and sinkings between ovolos, and these were occasionally employed to separate the parts of a cornice. Mouldings were also designed with reference to reflected light; the various members, scotias, and sinkings were defined by sharp shadows in many of the old base mouldings. The whole subject of mouldings is replete with interest to the artist, and our remarks may tend to incite the student to examine it with more scientific method and care.

THE DANGEROUS STRUCTURES IN THE HAYMARKET.

MR. MANSFIELD has decided in favour of the Metropolitan Board of Works and their surveyor, by granting the summons he dismissed on the 3rd ultimo against Mr. Fagg, the adjoining owner of 29, Haymarket. The decision has justified the remarks we ventured to make last week as to the actual state of the alleged dangerous structures at the side and in the rear of the above premises. Here was an arched chamber that had been brought to light by the taking down of some condemned walls in the rear; it was an interlapping structure belonging to the owner of 29, though it structurally seemed to be part of No. 1, Arundel-place, as above it the rooms belonged to the latter premises, while both above and below it the structures had been condemned and partly demolished. The chamber itself was found to be in a state of disrepair, and the taking down of the party-wall and chimney-stack next it certainly did not improve its condition, but rendered it necessary to shore it up. It was further found necessary to leave the base of the chimney-stack as a lateral support to the arched chamber. Mr. Walker had condemned the structure as dangerous, but the magistrate decided that as it was secured by shores it was safe, and the summons was dismissed. Last week we detailed the evidence that was adduced in favour of the summons being re-heard, the unanimity of which evidence was almost convincing. On Friday last a large number of qualified experts were arrayed on the opposite side, who bore witness in the most positive manner to the safety of the party-wall and arched chamber, and their examination and cross-examination will be found in our report of the proceedings. Mr. Sewell, in his examination, declared he had not perceived any new cracks in the party-wall. Mr. Harvey also said the wall was not in a dangerous state, and that the defects had been caused by the removal of the timbers. He was subjected to a long cross-examination by Mr. Grain, in which the question was put whether the absence of footings did not constitute an element of danger to a wall. Mr. Harvey justified his answer that in this case the wall was not endangered by the absence of footings, as it was a thick wall, that while it was a defect it might not be one of real danger. Mr. Hope, Mr. Goodchild, and Mr. Smith confirmed the opinion that the wall was not really dangerous, and that the bricks and mortar were fairly good. Learned counsel, when they examine witnesses on technical matters, too often expect a decided answer of "yes" or "no," and many able witnesses hesitate or decline to answer a question so definitively. It is sometimes impossible in matters of this nature to affirm positively, and it is absurd to expect an intelligent opinion from a witness who is not allowed to qualify his meaning. Thus, it is quite reasonable that a wall without a footing may be as safe, or more stable, than one of thinner substance with one, and it is scarcely fair to take a professional witness away from the actual case in point to an abstract case, even for the ostensible object of obtaining a favourable answer to the question. There are other instructive features in this rather protracted case that cannot be passed over without remark; one of these is the very conflicting evidence of the professional witnesses called by the opposite parties to the case. As we hinted in our previous remarks, a strong point for the defence in the matter of the arched chamber rested upon the possible adequate support the old party-wall afforded next the arch, a portion of which had been cut away. This plea was strongly urged by Mr. Fagg's counsel, and the witnesses called last Friday, including Mr. Harvey, Mr. Hope, and Mr. Goodchild, proved satisfactorily that the arched chamber would have been perfectly safe if the side wall had been allowed to stand to its proper thickness of 18in., even on the supposition that the shores were removed, and that when the party-wall of the new building is restored the wall and chamber would be secure. It was the concurrent opinion of all the witnesses that the principal support of arch had been taken away in removing the portion of party-wall next the arch, and that this fact had rendered inside shoring necessary. Under these circumstances it was only required to put back the wall in its place, when the shores could be taken away. The inference to be drawn from these statements is clear enough: it was attempted to be shown that sufficient care had not been exercised in the removal of the old work. Thus, while the witnesses on behalf of the Board contended for the insecurity of the structure from its present actual condition, those on behalf of Mr Fagg were contending that the structures in question would have been perfectly safe if certain things had not been done. A great deal of amusing bewilderment upon the nature of arched structures and their support was exhibited on both sides, and go to confirm us in the opinion that questions affecting structures under the Metropolitan Building Act should be heard before tribunals composed of practically qualified men. How an arch could fall under which a carefully-framed set of supports or centres was placed, upheld by two needles and upright timbers, or how the removal of the old brickwork on the side of No. 28 could affect more than the lower portion of the arched chamber of, Mr. Fagg, did not seem to have entered into the consideration of those who were conducting the prosecution; and, on the other hand, the witnesses for the defence seemed to overlook the fact that if the mass of brick composing the base of the old chimney-stack was taken away, it would in all probability undermine the wall below the arch, as the wall in question did not go down to the same depth. A very moderate knowledge of mechanical science would suffice to convince anyone of the actual requisites for the safety of such a structure as the one we are referring to; that if you support the crown of a vault underneath it cannot collapse, and that a whole building might be shored up by needles in such a manner that it could not fall, providing, of course, such shoring could be introduced without interfering with the building operations going on next door. But there is another issue affecting the "adjoining owner" that this case suggests. The owner or occupier of any "dangerous" structure can be ordered by the magistrate to "take down, repair, or otherwise secure, to the satisfaction of the surveyor, such structure or part thereof as appears to him to be in a dangerous state." This clause, referred to by Mr. Mansfield, leaves it entirely in the hands of a district surveyor; and we may imagine a case where the surveyor would not be satisfied with any amount of securing short of pulling down the old building. The question at once arises—How far a properly-shored structure is dangerous; whether if, when the adjoining owner secures his own structure by shores to the satisfaction of the surveyor he can be called upon also to take it down? The decision of Mr. Mansfield does not clear up this point; it merely declares a structure to be dangerous that has been reported to be so, and fails to decide what conditions and amount of care should exempt an adjoining owner from having to rebuild his walls that have been disturbed by the operations next to him. We are afraid the tendency of the decision in this particular case —which we believe has been fairly decided upon its merits — will be to subject the holders of leases to considerable expense and inconvenience, and we think that there is certainly an opportunity here for an amendment of the Building Act. In that part of the Act referring to party structures, the rights of building and adjoining owners are laid down with much care and detail. It is expressly stated that a "building owner" has a right to pull down any party structure that is of insufficient strength for any building intended to be built, provided he makes good all damage occasioned thereby to the adjoining premises. There are certain rules also as to exercise of the rights of both these owners, which require that the building owner should obtain consent of the adjoining owner, that he should not do anything to cause "unnecessary inconvenience to the adjoining owner," that the latter may require the former to build any chimney jambs, breasts, piers, &c., for his convenience, and that in cases of a difference the respective parties may refer the matters in dispute to arbitration. It should not be lost sight of that a party-wall is the property of both owners—each has a partnership right in his moiety, and it is absurd to suppose that at the instigation of one partner it is to be pulled down and rebuilt. If the Dangerous Structures clauses are to be construed in this spirit, the holders of old houses on repairing leases are exposed to risks which they never contemplated; at any moment they may be called upon to rebuild walls that might have well lasted their term, or be put to great inconvenience and expense through the animus or ill-feeling of their neighbours, or the hasty opinion of the surveyor. We have always maintained that the law of party-walls should be interpreted as favourably as possible for the "adjoining owner," that he should not be called upon peremptorily to pay for an improvement to his next neighbour's premises in which he does not participate, and that particular care ought to be exercised not to entail upon him any further expense than that necessary to secure his own structures during the time of rebuilding the adjoining premises.

Messrs. Bunnett and Co. (Limited) have just fixed another of their patent lifts at the Bank of England, and are now instructed by the Inland Revenue authorities to fix another of their patent lifts at Somerset House, in connection with other work of their manufacture.

SOUTHWELL MINSTER.

MR. GEORGE EDMUND STREET has sent us a copy of his report to the Bishop of Lincoln upon the restoration of Southwell Minster. Mr. Street thinks it desirable, reference having been made to the matter in the Building News, that the report should appear in our pages, in order that there may be no mistake as to what he did recommend.

14, Cavendish Place.
June 1st, 1876.

My dear Lord Bishop,

I am ashamed to say that I have delayed giving you the advice you desire at my hands as to whether you may safely give your approval to Mr. Christian's scheme for the restoration of the choir of Southwell Minster from day to day and week to week, because the more I thought of the case the greater seemed to me to be the difficulties in the way of doing anything which would not only be conservative of all the architectural interest and beauty of the building, but at the same time thoroughly useful for the religious worship and teaching of the congregations for whose use and edification the building is to be restored and rearranged.

As I find that I cannot endorse Mr. Christian's scheme for the rearrangement of the interior as it stands on his plan, I must go at some length into my reasons for dissenting from it.

As in so many of our great churches, whatever difficulty occurs here arises from the use to which we wish to put the church not being at first sight precisely the same as that for which it was gradually adapted by its builders; and it is very necessary to see whether we cannot so far harmonise the old and new uses as to get over almost all apparent difficulties. In its original foundation, Southwell Minster was just such a church in its ground-plan as one would like to devise at the present day for such a place. Its choir, east of the central tower, being only about 55ft. in length, afforded no more than just the due space for the ministers of the church and the decent celebration of their functions; whilst even if it were prolonged westward across the transept (which it may, perhaps, have been) its length would only have been about 80ft., and a choir placed at the intersection of the four arms of the cross would have been seen and heard better than anywhere else in the church by a large congregation.

These short choirs, so usual in the cathedral and conventual churches of the 11th and 12th centuries, were soon extended. The accommodation in the choir, which was so exactly what we can use well at the present day, was found in those days to be quite insufficient for the increasing members of the ecclesiastics connected with the church, and so, in the 13th century, an entire reconstruction on a very much enlarged scale of the whole eastern limb of the cross was constantly undertaken. At Southwell this enlargement was conceived in a most noble and artistic spirit, and the architectural result is beyond measure beautiful, few 13th-century choirs being more truly excellent in every way. Nor was it very extravagant in the space it gave to the choir. What this was, will be seen by the diagrams appended to this letter, from which your Lordship will see that the position of the altar could not have been removed more than about 12 or 15ft. nearer to the east than it was in the first position. The eastern bays of the north and south choir aisles were undoubtedly built for chapels with altars. They were not, therefore, allowed to be passage-ways, as proposed by Mr. Christian, and were no doubt screened off at the ends and sides from the rest of the church. In the same way the three eastern bays of the central portion, of late years thrown into the choir, and proposed to be again so used by Mr. Christian's plan, formed the Lady chapel, and between these three eastern chapels and the choir, one bay was left entirely free so as to form a procession path round the choir, and to give access to the three eastern chapels already mentioned, and to the two beautiful chapels opening as eastern transepts into the choir aisles. I hold, as an archæologist, that there can be little, if indeed any, doubt as to the general character of these arrangements. The only question not clear is as to the nature of the screens, which at that time inclosed the choir on all sides, and divided the aisles from it from the chapels. Probably, however, they were not very close, and did not shut off the choir completely from the nave, or it may be presumed that the close stone screen and loft, erected at the entrance to the choir in the 14th century, would not so soon have been substituted for them.

In the 13th century, no less therefore than in the 12th, the choir of Southwell Minster would have presented no difficulty whatever to our Anglican use. We should have been able to use the choir for the clergy, the nave and transepts for the laity, and the noble eastern chapel for those services, such as early Communion offices, early matins, instruction for candidates for confirmation, or for young communicants, &c., in which a small cougregation only is gathered before an altar, and where none of the adjuncts of a choral service are required.

The difficulties which now exist in the arrangement of the interior are entirely caused by the small addition to the church just mentioned, which was made in the 14th century, and which for all practical purposes has completely divided the church up to the present time into two distinct portions, of which one hitherto has been used only as a sort of narthex, and the other as a place of worship. This was the close stone screen and large rood-loft over it, with its row of highly ornamental stone canopies over the return stalls on its eastern side. This screen is about 15ft. in depth from east to west, is groined in three divisions, and has two staircases leading to the loft: this, which was originally intended for a rood-loft, is now found to be large enough to contain a considerable organ, which effectually completes the blockade between the nave and choir.

The consequence of the retention of this screen has been naturally, as in so many other cases, a complete alteration of all the arrangements of the ground plan to the east of it; and I hold that on architectural grounds the beauty of even the most exquisite screen would be dearly purchased by the consequent necessity of such alterations. In any real restoration of an ancient choir, I always maintain that the first thing to be done at all costs is to restore the altar to the place which the original builders of the choir intended it to occupy. Any other arrangement, out of deference to the builder of a screen added a hundred years later than the erection of the choir, is no work of restoration in any true sense of the word, but appears to be rather a blind and unintelligent deference to alterations to which we have become accustomed. The true course is, first of all, to restore the thirteenth century arrangements of the fabric; then next to see whether a due and good use cannot be made of the building when so restored; and lastly, if this due use is hindered or prevented by the subsequent erection of a piece of furniture (which is what the fourteenth-century screen is), then the only true course is to have the courage to remove the obstruction, preserving it carefully on account of its architectural interest, but not allowing it to hamper or hinder the whole usefulness of the building. The population of Southwell is not very great, and, consequently, I think it may be possible here to effect a compromise which in such cathedrals as those of Exeter and Ripon appears to be impossible. In the case of these two cathedrals, the retention of the old rood-screens appears to involve either the enlargement eastward of the old choir or, what is even more objectionable, the filling of the choir aisles with benches. It cannot be too strongly impressed on everyone that in such churches the choir aisles were distinctly passageways, and nothing else. To convert them to any other use is wholly to ignore their builders' intentions, and in my judgment wholly to ruin their effect. Keeping the principles which I have stated in view, let me now point out to your lordship what results they involve at Southwell, and how these results can be utilised satisfactorily without prejudice to the performance of Divine service. Beginning from the east end, there will be the old Lady-chapel, a central chapel of three bays, and about 45ft. in length. This should be screened off from the rest of the church, and, fitted up properly, would be most useful for early Sunday or week-day celebrations of Holy Communion. Similar use is made of similar chapels at Hereford, Salisbury, and other cathedrals. The practical convenience would be very great in many ways. West of this chapel would be one bay of the choir, which would form the connecting passage between the north and south choir aisles to the east of the altar in the choir.

The choir would consist of four bays east of the tower and rood-screen, and would be somewhat less than 60ft. in length. It should be fitted just as it originally was, as far as this can be ascertained. The stall canopies at the west end are very exquisitely designed and wrought in stone, and have been copied with singular skill and accuracy by Bernasconi in the plaster stalls and canopies which he erected on either side of the choir. When he erected these canopies he had, no doubt, removed the old wooden screens and stalls, and I was delighted to find lying in a heap of lumber in the roof of the chapter-house a number of fragments of these screens of extreme value and interest, and enough in quantity to give the key to the character of the whole of the wooden fittings of the choir. I advise, therefore, that Bernasconi's stalls and canopies should be entirely removed, and two rows of stalls should be fixed in the two western bays of the choir, leaving the two eastern bays free for the altar and its steps. In the choir so arranged there would be room, it is true, for only a very moderate congregation, but there would be ample room for the sort of congregation which assembles commonly on week-days, when the stalls are more or less occupied by laity, and when a few additional seats can be provided if necessary by the use of chairs below the stalls.

The difficulty now arises as to how we are to provide for the larger congregations which on Sundays, and especially on other days, will gather in such a church.

Assuming that the rood-screen is to remain, it will be important to see whether this cannot be lightened in some degree. At present it appears to be a solid wall of division between the nave and the choir. But when I visited Southwell I had the floor of the loft taken up in order that I might see if the old stairs remained, and there I found not only the two usual staircases, but also openings in the wall at the back of the stalls, which if they were repeated on the other (west) wall of the screen would have a valuable effect in making the screens more transparent, and the service in choir more audible than it now is in the church.

But at the best, such openings would make but a slight improvement, and it would not, I fear, make it possible at any time to use the nave and choir together without some modification of ordinary usages.

The use of nave and choir together appears to me, however, as I have little doubt it will to your lordship, to be the one object which in any real restoration of such a church ought to be kept in view, and I think it may be accomplished by the application of a little common-sense in the use we make of the existing features. I have already explained that the rood-screen was introduced as an addition to the then existing fittings of the church in the 14th century. When it was built the people still used the nave, and it is pretty certain that its builders had no idea of making that use less easy. The probability is all the other way. The loft was a spacious erection, approached by two staircases, and with ample area on the top for a choir of singing men. When it was built the choir stalls had each their own occupant, much more regularly using his seat than we now imagine, and there was probably no provision of any sort for choir boys, or for laity within the gates of the screen. I have no doubt that it was found to be desirable to give the people more, rather than less, opportunity of hearing the service, and that this loft which now seems to be such a hindrance was erected for this very purpose. It was, in short, the orchestra or singing gallery of the church; and I believe that it might again be restored to the same use with the best possible result.

When it was built, the organ was not the institution it now is. A small "pair of organs" may have been placed on the loft, and might again be restored to their position so as to give the choir all that they can require for assistance in their musical services; whilst the great organ can easily be provided for elsewhere, either out of sight, as at Canterbury, or at the end of one of the transepts, or of the nave, so as to be useful on great occasions for accompanying the unisonous singing of the nave congregation, and for other purposes when great organ performances are required.

With all the choir services sung from this central gallery or loft, the lessons read from an eagle under the central tower, and the sermons preached from a pulpit placed against one of the piers of the central tower, we should have the great satisfaction of seeing the whole church thoroughly usable in every part, in exact accordance with the intentions of the old builders, without alteration or removal of a single old feature, and with, I am certain, the happiest results from a religious as well as from an æsthetical point of view, and without any of those too-fashionable alterations of the old uses and arrangements of the choir aisles and chapels which have effected of late years in the cathedrals of Bristol, Ripon, and Exeter, and which Mr. Christian's plan suggests for your approval at Southwell.

If, however, your Lordship is not convinced by my statement, and is disposed to think that the restoration of the use of the rood-loft in the way suggested is not a scheme to which you could give your sanction, I must proceed to point out that there are two other courses open which would not involve an entire mutilation of the old choir arrangements (the retention of which ought to be a *sine quâ non* in any work of restoration), though I much doubt whether you would like to be responsible for recommending either of them in preference to the course already suggested.

The first would be the absolute removal of the 14th-century rood-screen and loft from its present position. This screen not being in the way, there would, of course, be no difficulty whatever in using the whole church properly; and, for myself, I have the courage to say that *were I not distinctly of opinion that the screen may be utilised in the way I have suggested*, I should not object to being responsible for its removal, and its re-erection in another part of the church (*e.g.*, across the transept), keeping it as an architectural curiosity, and not allowing it to be a hindrance to Divine service. The violence done in this way to one feature in the church would, to my mind, be moderate indeed compared to that which is done to every portion of the choir arrangements when, as in the recently-restored cathedrals already referred to, in order to save a disused rood-screen, the altar is moved back from its old place, the procession path round the choir is done away with, the stalls in the choir are added to, seats and chairs are introduced for the congregation between the stalls and the altar, and lastly, and perhaps worst of all, the aisles are opened to the choir, and seated for the congregation, whilst, as a consequence of all these changes, a nave restored or built at vast expense is incapable of doing any, or at any rate, proper service, simply because wrong service is demanded of the choir and its aisles. Such an illustration of straining at a gnat and swallowing a camel never was exhibited as is by those who, in their desire to be conservative about a rood-screen, are so radically destructive about every other ritual arrangement in an old church! But at Southwell I think the necessity for this sort of display of courageous common-sense, and respect for real archæology does not exist, and I do not therefore recommend the removal of the old screen, though it is the second in order of the alternatives open.

A third alternative would be to restore the choir exactly on its old lines, to keep the organ where it is, and to have the Sunday services held as they are now in the nave. But this implies the provision of an altar in the nave, with seats for the choir, and this would not only be very unsatisfactory in its effect upon the building, but might in many ways be liable to objection, and I mention it with no desire to recommend it. It seems to me to be the worst course of the three, but better than that which is shown on the plan proposed by Mr. Christian, according to which the choir is to be opened from end to end, the altar moved to where the Lady-chapel altar originally stood, the stalls increased in number, and the congregation seated (I suppose facing north and south) in the space between the stalls and the altar, and in the eastern transepts and choir aisles, or, to quote the words of Mr. Christian's report, "as regards the new seating, I do not think it would be desirable to put fixed seats *beyond the line of the transeptal chapels*, but would advise that the whole of the remaining portion be fitted with chairs. By this means within the limits named as regards the choir, and by *making use of the whole of the aisles and eastern transepts*, good accommodation would be afforded for the congregation of about 700, which in ordinary times would be amply sufficient, and on extraordinary occasions the nave and transepts would be available."*

I regret that I am obliged to trouble your Lordship at so much length with the reasons for the suggestions which I have had to make. It is necessary to do so, however, because the practical result is that I should ask you to put my suggestions in Mr. Christian's hands with a request that he would see whether he could not bring himself to agree with me. I am sanguine enough to think, from his tone when we went over the church together, that he would do so.

I know well that his most anxious desire is to leave this grand church, when he has refitted it, an example of a building restored in the best and most truly conservative way, both inside and out, and I feel sure that he will see that my proposals are wholly made with the object of assisting him in doing this.

The other portions of Mr. Christian's proposals are generally, I think, such as your Lordship may safely agree to. The restoration of the external roofs to their original pitch is a work as to the advantage of which there cannot be two opinions, and the restoration of the spires covered with lead on the western towers is much to be desired. As to the central tower, I agree with Mr. Christian in thinking it desirable not to alter the roof. The restoration of the roof of the chapter-house is a most desirable work. This beautiful building would have its charms much enhanced, and the room gained above the vault might well be fitted as a museum for the various curiosities discovered from time to time, and for the safe keeping of which some apartment is much required in such a church. As to the proposal to remove Bernasconi's tabernacle work, I am agreed with Mr. Christian; but as when he made his report I think he was not aware of the existence of the fragments of old oak screens and stalls, he would probably modify his proposal to erect iron grilles. If my suggestions are adopted, the aisles will not be wanted for congregational purposes, for which they were not built, and very open side screens would not be required.

I agree entirely in Mr. Christian's proposals as to the arrangements for the vestries and library; but I venture to suggest the advantage of securing the old hall of the Bishop's Palace, and restoring it as a choir practising room or school—a room much wanted in connection with such a church.

In regard to the chapter-house, I would suggest, in addition to the work proposed by Mr. Christian, that the beautiful passage leading to it should be properly restored or repaired.

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* The italics are not Mr. Christian's. It will be observed that no explanation is given as to how the nave and transepts are to be made use of on extraordinary occasions.

In the warming, as now managed, I think great improvement might be made. At present a chimney from each stove defaces and destroys the stonework in its neighbourhood. I should like to see the whole church heated from an apparatus and furnace placed entirely away from the minster, in part of the old palace to the south of the south transept. The fuel might then, as suggested by Mr. Christian, no longer deface any part of the church, and the damage by smoke would also be avoided. The annual cost of the fuel for, and repairs of a number of Gurney's stoves is very considerable, and their unsightliness is equally great. If the altar is placed in its old position, as suggested by me, funds would no doubt be forthcoming from independent sources for making it, as well as the reredos, pulpit, and other fittings, worthy of the building in which they are placed.

The plans appended to this letter are (1) a plans howing the position of the altar in the 12th-century church, and (2) a plan showing the arrangement of altars, screens, and choir, after the choir had been rebuilt in the 13th century. The subsequent alterations were the erection of very magnificent sedilia in the south wall of the Lady chapel, and the erection of the rood-screen and loft at the west end of the choir. There is, I believe, no evidence whatever that the choir altar had been moved from the place shown on plan No. 2 before the Reformation.

I trust that I have said enough to show, that if the case is not unattended with difficulties, there is, nevertheless, every possibility of making this noble church thoroughly useful at the present day without removal of any old features, and without departing in any degree from the old lines.

Believe me to be,
My dear Lord Bishop,
Yours very sincerely,
(Signed) George Edmund Street.
To the Rt. Rev. the Lord Bishop of Lincoln.

ON COMPARISONS AND ANALOGUES OF THE MOUNDS SIMULATING ANIMAL FORMS IN EUROPE AND ASIA WITH THOSE IN AMERICA.*

IN this paper, which was illustrated with a large number of drawings and representations of mounds by photographs and other pictorial figures, the author confined himself chiefly to an enumeration of such mounds as he had discovered, together with the principal features and physics of the localities in which they were found, and such accompanying information as might enable other explorers to compare the results of their own investigations with his, and thus, possibly, to arrive at some conclusions, sooner or later, as to the people by whom, or the periods in which some, at least, of these remarkable and little-understood emblems were formed.

He was bound to give, he said, what was due in every respect, both in point of time and extent of discovery and research, precedence to the great American explorers, Messrs. Squire, Lapham, Davis, and others, the results of whose labours have been from time to time made known through contributions from those authors in the "Smithsonian Contributions to Knowledge," by very carefully-figured representations and by minute measurements, proving beyond question that these mounds were, for the most part, remains of wonderfully-modelled forms of animals, both as to correctness of proportion and enormous dimension; the most perfect and beautiful of all, probably, being the vast figure of a serpent with a triangular mouth or head, facing a mound of sacrifice, and which serpent, if its convolutions were unfolded, would measure 1,000ft. in length. These American mounds simulated a great variety of forms besides that of the serpent; those of quadrupeds, apparently, in some cases unmistakably. Prof. Rupert Jones had forwarded to him (Dr. Phené) some time since a sketch of a mammoth or elephant, so figured and distinctly capable of identity. Some from the lapse of ages and the effects of rain and weather were not, of course, capable of identity as to the exact animal represented, and consequently they assumed the forms of vast saurians, with flattened or shapeless projections, perhaps originally so formed, perhaps once representing outlines of carefully-modelled members of quadrupeds. There were also birds: some rude outlines which might once have represented the human figure: and other forms besides those of animals, as crosses and emblems, the meanings of which, if perfect, would not at this day be understood, as we know nothing of the people who constructed them.

The author observed that he had not been led to make his own researches from these discoveries in America. At the time he was prosecuting investigations which resulted in the greatest success, he was quite unaware of any such discoveries as those he had just enumerated. He was led to make his inquiries from the question being undetermined amongst British antiquaries, as to whether the serpent was an object of worship with the early inhabitants of Britain or not: and he had nothing to go upon but vague suggestions and semblances drawn from the positions of stones here and there on the great moors of England, Scotland, and Ireland, which stones, when they did assume an approach to such device, were generally found to have been removed from their original positions, and must by the merest accident have been found as they now are. The only unmistakable form that he could rely on in Britain up to that date was that discovered by Dr. Borlase in Cornwall, and engraved by him in his work on the antiquities of that county. That form was serpentine, and was composed partly of earth forming a mound, partly by stones, so that it was possible that some of the curious positions of stones considered by former antiquaries to have represented the serpent had once done so, that the mounds had been removed for agricultural purposes, and hence the uncertain positions of the stones.

At the same time that he was pursuing his researches, with little or no indications to aid him, Mr. William Simpson,* to whom he was then unknown, and who was at that time as equally unaware as himself of the discoveries in America, and knew nothing of so-called animal mounds or of any such ancient simulations, except those in rude sculptures on the rocks and in caves in India, discovered in China some very remarkable mounds, which, though not in the forms of animals, were curiously enough in forms which happened to have been those which had led him (Dr. Phené) to make his own researches, and had, in addition to this, discovered long winding serpentine avenues leading to the great tomb temples of the Ming dynasty also in China, both sides of which were apparently guarded by enormous stone effigies of all the larger quadrupeds known in the east. The serpent did not appear—so far as he was able to discover—among these forms, but the way was a serpent, the tomb temple being the head, and this, no doubt was the explanation of that special myth of Chrisna and his followers, when he was hard pressed by an enemy, taking refuge inside a serpent's head. There seemed no question that these serpentine ways did represent the serpent, as the word "Lung" (pronounced Loong) was equivalent to serpent and these winding ways were so named, as Mr. Simpson discovered, on inspecting the tomb of the first of the Ming dynasty at Nanking. The same idea was evidently emblemed in the vast simulations of animals in the mounds in America, and these carved simulations in China. The mounds he had referred to as discovered by Mr. Simpson, and as being of the same outlines as the forms which had led him (Dr. Phené) to make his researches, were also tombs, and the information Mr. Simpson had given him amounted to this: the mounds placed in the great Necropolis in China over poor men were single cones; those over great or wealthy men had three points, the summit being divided into three portions, and near the latter were found large animal forms in stone. Dr. Oliver, a learned writer on ancient customs, had stated that the mountains in Britain were resorted to for the performance of rites connected with the early religion of the land, and that of these mountains the single peak was sacred, the dual peak more so, and the triple-peaked mountain so in particular. On this alone, he (Dr. Phené) had commenced the prosecution of his investigations, and in almost every case of a triple-peaked mountain he had found an animal form, generally that of the serpent, in its vicinity.

Mr. Squire had figured two of the largest forms of serpents in America, as constructed—the one of earth, in a continuous and solid form, the other of earthen mounds placed at uniform distance, in a curved line, of great length and beautifully symmetrical, simulating a serpent, and each form having the same representations of symbols at the head. He (the author of the paper) had found the serpent in both these forms in Britain. They were each distinctly defined, and in every case they were proved to be sepulchral, from the remains in them. They could all be shown to be of the highest antiquity. In the head of one of those in the solid or continuous form was a triangular chamber formed by three vast blocks of granite, in which were evidences of a grand cremation. Cremation was also, in some instances, found to have been used in the separate mounds, which appeared either to have formed a serpent necropolis, a new mound being formed on the death of each member of a tribe, or one interment of a number of persons at the same time, a separate mound placed over each of so many followers who have fallen with, or in defence of a chief of a serpent tribe, so-called, or emblemed, as, for instance, the Snake Indians in America are to this day. Both in Europe and Asia he had found such forms not only like the great serpent ways of India discovered by Mr. Simpson; not only mounds constructed as he had described, but also mounds formed partly of soil and stones, sometimes both added on to other portions of a form, which latter was sometimes cut into shape, sometimes, probably, a mere natural simulation, and in some cases completely natural forms, and even mountains, so unmistakably adopted as places for worship of the serpent, that doubt as to the cause of selection could not exist, as in the serpentine mountain of Pergamos, in Asia Minor, where Esculapius had his grandest temple, and in every such case vast sepulchral remains existed, showing the importance of the spot. These always contained remains of the highest antiquity, in each country in which he had discovered them. He had found them in Scotland, England, Wales, Brittany, and the Pyrenees; also in Greece and Asia Minor, and in the islands of the Levant. In several cases, where the mounds had eluded the notice of treasure-searchers, portions were found where lithic arrangements showed even a careful representation of the positions of the bones of the animal. These discoveries have been made in the presence of many persons, at various periods, and separate accounts had appeared, from time to time, in the leading English and Scottish journals. The exact details were proved by photographs taken on the spot, and exhibited to the meeting. Similar additions to natural mounds, as well as natural simulations, were referred to in America, as Lapham's Peak, &c.

IRON AND STEEL AS CONSTRUCTIVE MATERIALS.

LAST week before the Iron and Steel Institute at Liverpool, Mr. J. A. Picton read a paper on "The Progress of Iron and Steel as Constructive Materials." In the following words Mr. Picton introduced his subject:—"The working and employment of metals have from the earliest ages exercised a most important influence on the progress of the human race. The ancient poets celebrated in song the golden and silver ages, typifying what was supposed to be the primitive state of innocence and purity of our early fathers; but the real advantage and progress of humanity commenced with the use of iron. It would be hardly possible to exaggerate its importance in the economy of human affairs. The employment of iron is a crucial test of the civilisation of any people at any period of history. Without it art and science are comparatively unknown, and progress, except to a very limited extent, is impossible. With the free use of iron commenced the dawn of the arts of life. Every invention which contributes to material comfort, every pursuit which tends to elevate humanity, is connected with the employment of iron. A little reflection will show that this must of necessity be the case. The progress of man, whether physical, mental, or moral, is intimately connected with his conquest and mastery of the material elements by which he is surrounded. For this purpose no instrument has anything like the potency which belongs to iron. It is iron which digs the mines, iron which ploughs the land, iron which reaps the harvest, iron machinery which grinds the corn. It is iron which fells the timber, iron which converts it into building material or decorative furniture. Every department of industry, every art of life, is dependent on iron. It is iron which out of the rough marble blocks brings forth forms of beauty and life. It is iron which quarries the stone and shapes it into stately piles of magnificence and grandeur. The exercise of man's constructive faculty to any extent would be impossible without this instrument. What infinite forms of utility or beauty does it assume, from the delicate trinkets of a lady's boudoir, the minute hair-spring of a watch, even a dinner card of invitation, up to the ponderous plating of an iron-clad, or the mighty percussive strokes of the steam forge hammer. Nature has placed in the hands of the human race no power so potent as steam, which in less than 100 years has changed the aspect of the world to a greater extent than in all the ages that have gone before; but without iron the steam-engine would have been an impossibility. The modern developments of the applications of iron surpass all which have gone before, and are daily extending in magnitude and importance. The railway, with its locomotive speeding along with arrow-like swiftness, the mighty steamship ploughing the ocean with its thousands of tons of merchandise, the telegraph wire, like Ariel, putting a girdle round the earth, and annihilating time in bringing together distant regions, are amongst the latest illustrations of what we owe to iron." After giving an historical review of the application of iron, from the time of Tubal Cain to the 16th century, Mr. Picton said that from the 17th century onwards the use of iron in works of magnitude became general. One of the first employments of iron on a large scale was in bridges, and Mr. Picton described some of the more famous structures of that character. Then came railways and the various appliances connected with them, and the supersession of wooden ships by iron and steel ones. Mr. Picton also spoke of the enormous weapons used in modern warfare, and then alluded to the use of iron and steel as building material instead of stone, brick, and timber. In conclusion, he said—"Machinery, whether locomotive or manufacturing, is undergoing a constant but quiet revolution, consisting in improved economy of materials, rapidity of motion, and increased efficiency. Iron ships, especially steamships, are increasing in size and power, to which the introduction of steel plates will impart greatly increased advantages. In warlike affairs, whether the contest between armour-plating and armour-piercing has reached its acme I will not take upon myself to say. The final decision of the problem is one of great interest as to the future employment of iron for such purposes. The facilities of iron, especially wrought iron, for all engineering constructions are more and more appreciated year by year; but with some few exceptions there is a great defect running through them all in the absence of anything of æsthetic taste in the designs. The ancient motto for building was 'strength, commodity, beauty.' The two first have been attended to almost to the entire neglect of the third. This I cannot help thinking is a great mistake. The grand engineering works with which the surface of our country is studded should have a dignified and noble aspect. They should minister to the sense of beauty and fitness as well as to that of strength and power; but too frequently the reverse is the case. In architecture, properly so-called, iron is doubtless destined to play a very important part. Hitherto architects as a body have neglected iron. When employed, they have striven to hide it from sight, and seem to apologise to themselves and the world for being obliged to use it instead of brick or stone. Its use, however, is being forced upon us, and on every side we are met with iron sheds, iron churches, iron houses. The designs of these are usually hideous to behold, but why should this be so? Why should architects not face the difficulty, and instead of letting iron master them, convert it into their handmaid and servant. The mediævalists followed a different course. They took the material which lay before them, and, by a happy audacity in design and skill in construction, they produced effects which, for composition of masses, picturesqueness of outline, and brilliance of inventiveness, have ever since been the admiration of the world. Looking to the future, there can be no doubt that iron is every day becoming a more important factor in the world's affairs. The ages of stone and bronze, the times of darkness and ignorance, have passed away, and with the use of iron came in power and knowledge and light. It is destined to work yet greater wonders. It is its mission, sent by a gracious Providence, to lighten men's labours, to give him the mastery over nature, to enable him to explore her secrets, to comprehend her laws, and turn them to the best advantage for the welfare of humanity. The ages of gold and silver may serve for the theme of the poet's fancy or the dream of the enthusiast, but the age of knowledge, and progress and power, and wisdom is the age of iron."

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* A paper read by Dr. Phené, F.S.A., F.R.I.B.A., F.R.G.S., F.G.S., &c., &c., before the International Congress of Americans, Brussels, Sept. 25, 1879.

* Special artist to the *Illustrated London News*.

THE MELBOURNE INTERNATIONAL EXHIBITION.

THE year 1880 will be an important one in the annals of Victoria. The colony then intends to invite the world to see what great and rapid progress it has made. The size of the Melbourne Exhibition will give visitors a very good idea of the position attained. The London International Exhibition of 1851 had a superficial area of 794,970ft.; Melbourne, for her first International Exhibition, shows the creditable figures of 513,658 superficial feet. The design for the Melbourne Exhibition was chosen in open competition. The first premium was awarded to Messrs. Reed and Barnes, of Melbourne, who were deputed to carry out the work. The people of Melbourne up to the present time have often felt the want of a permanent building of large size on the occasions of intercolonial and other exhibitions. No building larger than the Town Hall being available for such purposes, it has often been necessary to expend large sums of money on temporary buildings, which very inadequately answered the purposes for which they were intended. They will now have a permanent building, capable of accommodating 25,000 people, for an expenditure of about £70,000. The Carlton Gardens, which, "within a generation, formed part of a forest in an unknown land," are in all respects as good a site as could have been chosen. They are centrally situated, favourable for approaches and entrances, and interfere with no existing buildings, and from their elevation (being a hundred feet above the Post Office), the Exhibition will form a prominent feature from all parts of the city. The plan of Exhibition buildings, as described by the *Australian Engineering and Building News*, is in the shape of a Greek cross, with two of its arms lengthened. The nave is 500ft. long in the clear, and 60ft. wide; the south transept is 120ft. long, and the north transept 140ft. long, both being the same width as the nave. Running round the entire lengths of nave and transepts are aisles and galleries 20ft. wide, and attached to these are four courts on the ground floor, with four picture galleries above, all 30ft. wide. The nave and transepts are 75ft. high. The roofs are formed of ornamental circular-framed ribs, springing from iron columns, boarded and decorated in colour on the underside, and covered on the outside with galvanised corrugated iron. There is an extensive basement under the south-west portion of the building, giving an area of 140,000 square feet, amply lighted and ventilated, and well adapted for refreshment rooms and similar purposes. There is no direct top light. The windows are all high up above the floor, thus preventing any glare in the eyes of the spectators. There are eight staircases, carried up in the towers of the angles of the nave and transepts, giving communications with the galleries, and conveniently placed at the different entrances to the Exhibition. The dome, springing from the junction of the nave and transepts, and forming the central feature of the building, both inside and out, forms an octagon 100ft. in diameter at the base. About 100ft. above the floor level the drum is octagonal on plan, and 60ft. diameter. The dome is of good curve both inside and out, and is crowned by a lantern at a height of 212ft. above the floor-level. All the walls are of stone and brick, and substantially carried out.

The style of the building is described as Italian Renaissance, very freely treated. The façade towards Victoria-street is 600ft. long. Broken in the centre by the pediment over the transept with its angle campaniles and by the dome, and varied at the angles by the staircase towers, it fulfils the acknowledged rules as regards outline—the chief point (though one often neglected) in a building. One of the great advantages of the dome is that it "pulls the whole building together," and does away with what the late Sir Charles Barry used to call "wainscot architecture,"—a good front elevation and indifferent side elevations.

The four entrances are emphasised by bold arches spanning the openings, with pediments over, in which the greater part of the decoration is placed. On either side of the entrances are the campaniles, containing the staircases, which prevent any appearance of weakness from the largeness of the openings, and are correctly placed to group with the dome. The minor architectural features consist of the usual mouldings, architraves, and cornices. The walls are enriched by panels, and of course, remembering the architect, we have the usual buttress, with the inverted truss instead of a weathering and a vase at the top, which is Mr Reed's hall mark. We have no reason to quarrel with them in this particular instance, as they give an appearance of additional height by breaking up the wall space, though it is a feature quite foreign to Italian Renaissance.

The façades towards Nicholson and Rathdowne-streets are 220ft. long, irrespective of the transepts, and are similar in character to the front. The interior of the building will depend mainly on colour for its architectural effect. The estimate of Mr. Mitchell, the contractor, was £1,500 within the stipulated amount. The work is to be finished within fifteen months of the date of the contract. In addition to the Exhibition building proper, which forms the permanent building, there are the machinery annexes and other buildings of a temporary character, connected by corridors with the main building, which bring up the total number of superficial feet available for exhibitors to 543,658ft.

Our contemporary takes exception to the construction of the dome. To hoist girders, weighing seventy tons each, 60ft. above the ground to carry a mass of brickwork, when the whole of the dome above the roof might have been more elegantly, more cheaply, and more scientifically constructed in iron, is diametrically opposed to the teaching of the nineteenth century—"the iron age." Sir Christopher Wren, scientific constructor that he was, would not have used brick for the cone to support the lantern of St. Paul's Cathedral, had iron construction been as fully known as it is now.

The medal and form of certificate, for presentation to the Exhibitors, have been designed by Mr. R. O. Campbell, and Mr. Charles Turner. It is hoped the die and plate will be executed in the Colonies.

CHIPS.

Mr. Samuel Pipe, for 27 years foreman of the Lowestoft works of Messrs. Lucas Brothers, contractors, died last week at the age of 75.

The tomb of H.R.H. the Duke of Sussex in Kensal-green cemetery is said to be in a most dilapidated condition, and indeed likely to fall in, owing to the recent wet weather. The tomb was erected by the Freemasons of England.

The Lochgelly new public waterworks will be commenced in a few days, the contract for the same having been intrusted to Messrs. Connally and Torrance, Kirkcaldy, at the sum of £4,227.

The new saloon at Whitby was opened last week. Mr. Julius Mayhew, of London, prepared the plans, which have been carried out under the superintendence of that gentleman and Mr. E. H. Smales, the local architect; Mr. John White, of Whitby, being the contractor. The structure is built of brick, diversified with stone. The style is Queen Anne. The large assembly-room will seat nearly 1,000 persons.

The operative plumbers of Blackburn will probably accept without dispute the six months' notice of a reduction in wages of 1d. per hour, which comes into operation next week.

The Custom-house at Castletown, Isle of Man, is undergoing extensive alterations and renovation. The work is being carried out by Mr. Flaxman Stowell, builder, of Castletown.

A scheme is being promoted for forming a narrow-gauge railway from Dublin to Blessington. Brittas, and Baltinglass. There are no heavy cuttings or severe gradients on the route, and the cost is estimated by the designer, Mr. Lewis, C.E., of Dublin, at £1,000 a mile.

The site of the Alcazar, Leicester-square, being cleared, the directors have given instructions to proceed with the necessary arrangements for the building.

The annual outing of the Bath Builders' Association took place on Tuesday week, when the village of Stourton was visited.

Considerable alterations and improvements have just been commenced in connection with the premises of the Bank of Scotland at Dundee, from the designs of Mr. Geo. S. Aitken, architect.

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ILLUSTRATIONS.

SELECTED DESIGN FOR THE NEW MUNICIPAL OFFICES, GREENOCK.—INTERIOR OF HOUSE AT PARIS.—INTERIOR OF BILLIARD-ROOM, ST. JOHN'S-WOOD. — HEADLAND-BUILDINGS, LEEDS.—SEXTON'S LODGE, NEAR LEICESTER.—LODGE AT COPPINS.

OUR LITHOGRAPHIC ILLUSTRATIONS

NEW MUNICIPAL BUILDINGS, GREENOCK.

We give two of the principal elevations and the principal plan of the selected design for the new municipal buildings at Greenock, by Messrs. H. and D. Barclay, Glasgow. The style is Renaissance, and the buildings, which will cost not less than £80,000—not £8,000, as stated on p. 385—were fully described by us last week, when we announced the result of the competition.

INTERIOR OF HOUSE AT PARIS.

The interior we publish this week is a view of the entrance hall and staircase of the house in the Paris Exhibition built by Messrs. Collinson. This interior, with the furniture shown, was designed by Mr. Thomas E. Collcutt. We published the exterior view some time since.

BILLIARD ROOM, ST. JOHN'S WOOD.

The room illustrated is an addition to a detached house, and is 36ft. long by 18ft. wide. The front portion, shown in the drawing, is the billiard-room, 24ft. by 18ft. by 18ft. high, the part beyond the detached columns being used as a card and smoking-room, 18ft. by 12ft., by 12ft. high. In the basement there are wine and coal cellars, heating chambers, &c., and a part is left open to the garden, a semicircular arcade carrying the external walls. The floor of the room is constructed of rolled iron joists and concrete, upon which rough boarding is laid to receive the finished floor of oak in narrow widths, and walnut borders. The billiard-room is panelled to a height of 5ft.; the smoking-roo up to ceiling. The columns and pilasters carry an entablature with a carton-pierre cove above, the roof being panelled in wood, finished with a flat ceiling in panels of ground plate-glass. The mantelpiece in smoking-room is an old Elizabethan one, which, together with the iron backing at grate, was supplied by Messrs. Feetham and Co. The carving above mantel and the enriched panel are all old. The woodwork throughout is of walnut with grey oak panels, and the fretwork of white abele. The detached columns at division of rooms are used as a cue stand and cigar cupboard. The whole of the joiner's work is executed in the best possible manner, and secret-fixed. The wall space between columns is hung with tapestry. The billiard-room is lit by a Stroude's sun-burner, and the smoking-room by four pendant lights in copper and brass, on the Rickett principle, to ventilate the room. The billiard-room is heated by hot water, with gratings under centre of billiard table. Special woods supplied by Mr. Alfred Roberts, and the general execution of the work by Messrs. Aldin and Son, builders, Kensington, under the direction and from the designs of Mr. Thomas W. Cutler, F.R.I.B.A., 5, Queen's-square, W.C.

HEADLAND BUILDINGS, PARK-ROW, LEEDS.

The building shown in our illustration was completed in the early part of this year, and has been erected from the designs of Mr. George Corson, architect, of Leeds. The accommodation provided for the tailoring business of the proprietors, Messrs. Headland and Sons, consists of a shop, cutting-out room, and office on the ground floor, a show room on the basement and tailor's workroom, housekeeper's rooms, and a dining-room for Messrs. Headland, on the top story. A separate stair at the back, communicating with Basinghall-street, admits the workmen to their room, and to the cutting-out room. The parts let off comprise a large shop on ground floor, with show room below, four offices on the first floor, and four on the second. Harehills stone is used for the front, but that part of the top story between the bow windows is constructed in wood. The upper part of the transome windows is filled with glass in lead; and the lead is gilded externally. The brick and mason works were done by Mr. E. Boothman, the joiner work by Longley Brothers, slating by Watson, Wormald, and Co., plumbing by Joe Lindley, plastering by Richard Pearson, painting by Jackson and Co., and carving by Mawer, all of Leeds. The wrought-iron gates and railing to the area were made by Robert Sones and Co., Knowsley Works, Cheetham, Manchester.

SEXTON'S LODGE, SYSTON, NEAR LEICESTER.

This lodge, which is just completed, forms a part of the new cemetery which will be consecrated during next month. It is built of local red bricks, with "Brown's" ornamental bricks sparingly used for gables and other purposes, and the projecting gable over entrance is timbered with Portland cement rendering. Mr. Arthur Ardron, of Leicester, is the architect.

ENTRANCE LODGE, "COPPINS," IVER, BUCKS.

We give this week an illustration of entrance lodge in course of erection at "Coppins," Iver, for James E. Taylor, Esq., and under the superintendence from designs of Messrs. Tarring and Wilkinson, architects, of 69, Basinghall-street, London. On the ground-floor are living-room, kitchen, scullery, closet, w.c., and coal-cellar. On upper floor are three bedrooms and large closet. The lodge is of the half-timbered type, the ground-floor walls being red brick, the upper portions being half-timbered (oak) work, filled in with stucco and upright tiling, the roof being covered with mixed brown and red tiles. The building is being erected by Messrs. Catteridge and Son, of Uxbridge, at a cost of £550.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Discoveries at Pompeii.—Yesterday week was observed as a commemoration of the eighteenth hundred anniversary of the destruction of Pompeii. At ten o'clock the directing engineer of the excavations, Signor Ruggiero, delivered an inaugural address in the Great Basilica, probably the most ancient building in Pompeii, as it already existed A.U.C. 676, and the portico which faces toward the forum is of greatly anterior date. On the podium at the eastern extremity a temporary theatre had been erected to accommodate the orators and shelter them from the rays of the September sun, which by this time was too powerful to be quite pleasant. After Signor Ruggiero's Italian speech, a general adjournment took place to the spot next to be excavated. Finding it impossible to be at all the points of interest, ten new excavations being carried on simultaneously, the *Standard* correspondent went, being advised by those most competent to judge, to section No. 9, and there, in a small division parallel to that numbered five, the curiosity of the spectators was soon richly rewarded. Almost with the first strokes of pick and spade, there came to light a quantity of household objects, of light and beautiful forms and delicate workmanship. There were bronze amphora lamps, brooches, bracelets, vases, and one very large and elegant bronze candlestick; earthen vessels of various forms; fragments of glass, amongst which were the pieces of a lovely little glass vase of the most brilliant blue colour. The belongings of the upper and under stories of this little house were curiously mingled together, objects of mere ornament being mixed up with kitchen utensils. Then came some large tiles and fragments of a large beam of wood, showing that the roof had been crushed in on the lower stories. It is judged to have been the shop of a seedsman, for, besides some bronze scales and weights, several large heaps of small beans, grain, and hemp seed came to light, with portions of wooden casks and canvas sacks in which they had been kept. One piece of sacking was wonderfully perfect, although quite black. In one corner were the bones of some small animal, probably some household pet; and stuck against the wall was a skeleton of a little bird, its breast pressed against the mortar, where it had clung in its fright and bewilderment. Several human skeletons were found in other parts of the city, and one very perfect piece of mosaic pavement.

COMPETITIONS.

Bradford.—A new technical school is the subject of a competition among the architects at Bradford, the plans being sent in last Tuesday, the 30th ult. It seems that the council of the Institute have given a sort of half-promise to appoint a professional referee, and we have been asked to urge the adoption of such an election. This we readily do, because such a course must be likely, if not certain, to insure a satisfactory result. The present President of the R.I.B.A. would, we are sure, do justice in advising the Bradford people in selecting a design for their new technical school. Hitherto Bradford competitions have invariably resulted in the selection of local men, and the townspeople seem therefore to hang well together; but whether justice has been equally conspicuous in former competitions is by no means so evident.

Ilkeston Board Schools.—The School Board for Ilkeston recently invited designs, under mottoes, for the proposed Granby schools, the author of the design placed first to be appointed architect for their erection, the second to receive £10, and the third £5. On Thursday, the 25th ult., a decision was arrived at. Mr. Tait, of Leicester, was appointed architect, provided he will prepare plans acceptable to the board which can be erected for £4,000. The second premium was not awarded, but the third was voted to Mr. Knight, of Nottingham.

CHIPS.

The Parkes Museum of Hygiene was reopened on Wednesday, on the occasion of the Inaugural Conversazione of the Medical School at University College. A new and enlarged edition of the descriptive catalogue of the museum is now ready.

All Saints' church, Horstead, near Norwich, which was till recently in a very dilapidated state, has undergone partial rebuilding and restoration, and was reopened last week for service. The architect was Mr. R. M. Phipson, of Norwich and Ipswich, and the contractors were Messrs. Cornish and Gaymer, of North Walsham. The outlay amounted to about £900.

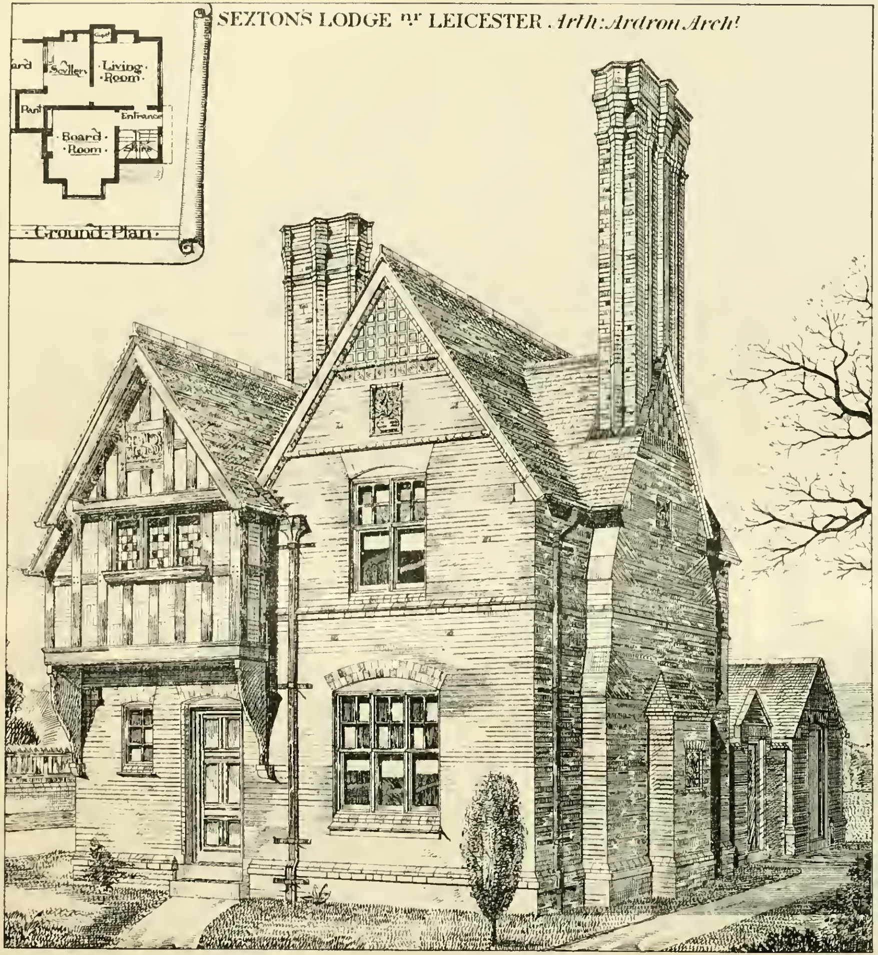
A new Episcopalian church at Scapatrick, near Banbridge, seating 200 persons, was opened on Saturday by the Bishop of Ossory.

The light line of railway connecting the hitherto isolated watering-place of Southwold with the Great Eastern Railway system at Halesworth, was opened on Wednesday week. The gauge is only 3ft., and the maximum speed allowed by the private Act is 16 miles an hour.

We are sorry to hear of the death, on Sunday last, at the early age of 55, of Mr. George Wood, architect, late of Whitehall, and for some years manager to the late Sir Gilbert Scott and Mr. G. E. Street, R.A. But nine days previously we heard him give evidence in the Haymarket case at Marlborough-street, and we were struck by his self-possessed and quiet demeanour in the witness-box.

"The Bouffet," which is one of the handsomest restaurant out of London, has just been opened in Dundee. The work has been carried out from the designs and under the superintendence of Mr. Geo. S. Aitken, architect.

SEXTON'S LODGE nr LEICESTER. *Arth: Ardron Archt.*



·Lodge·Coppins·
for J.E. TAYLOR·esq
Messrs Tarring & Wilkinson Archts

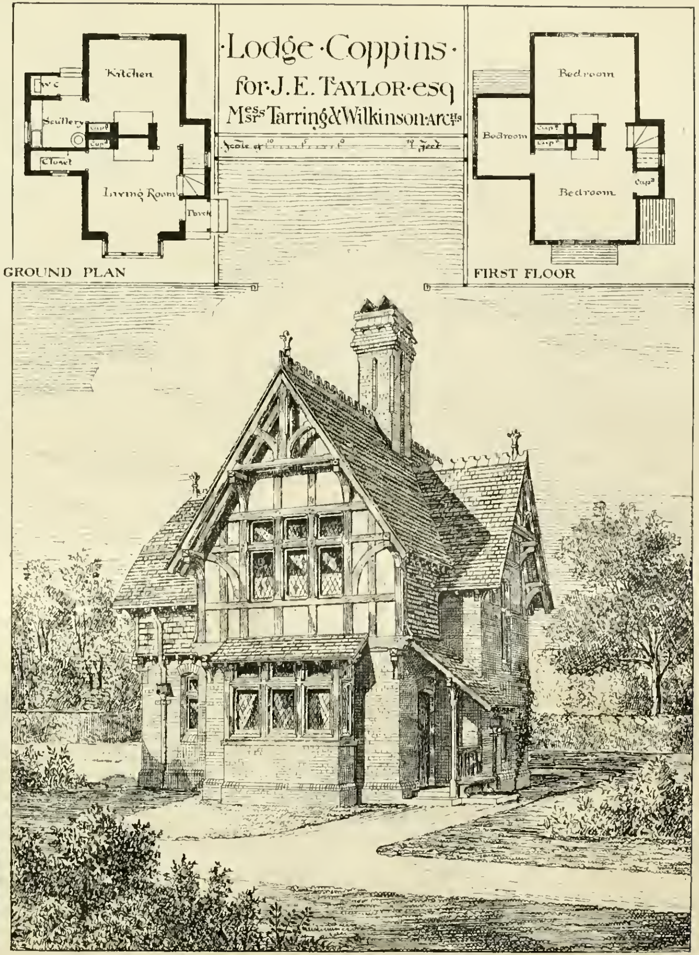
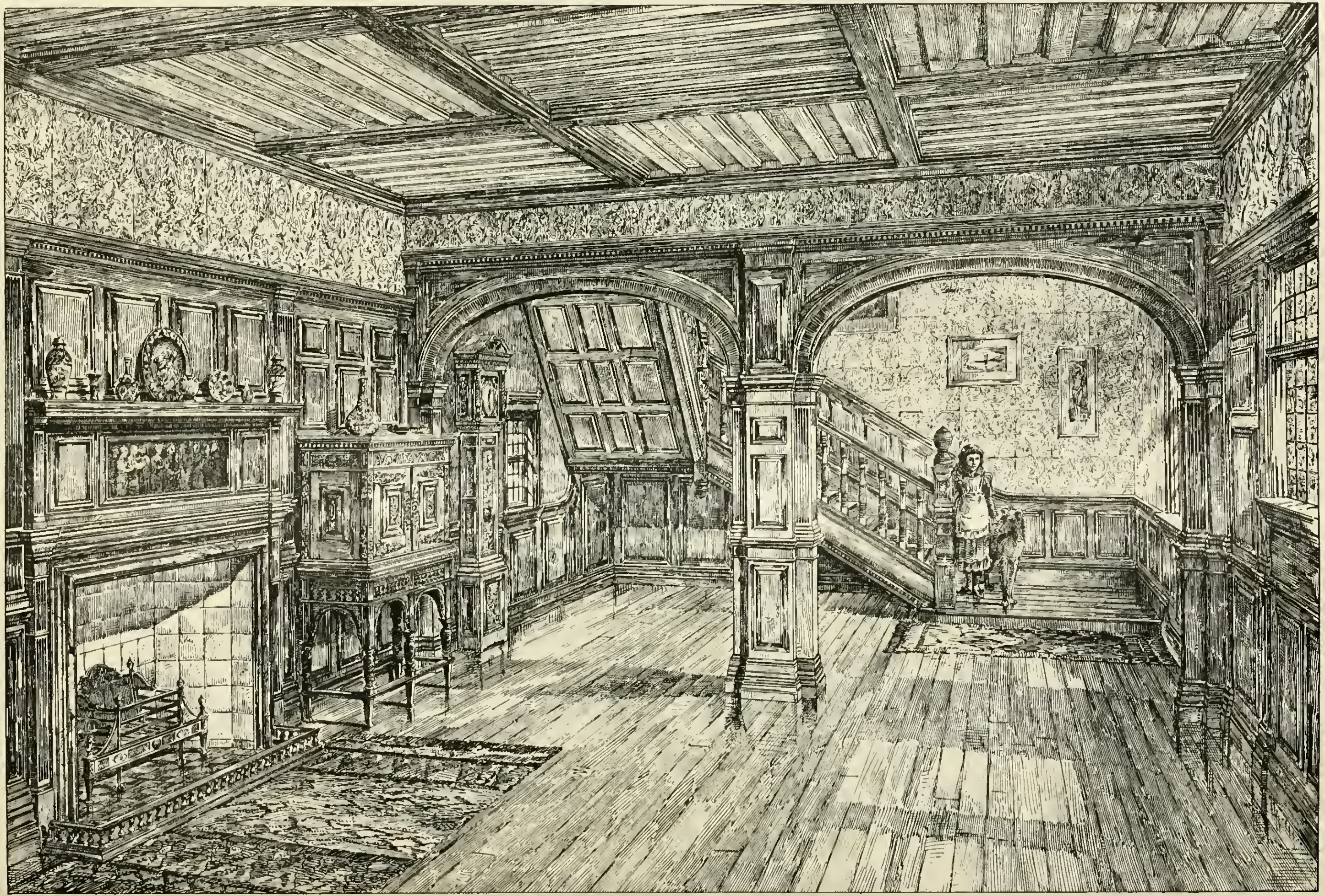
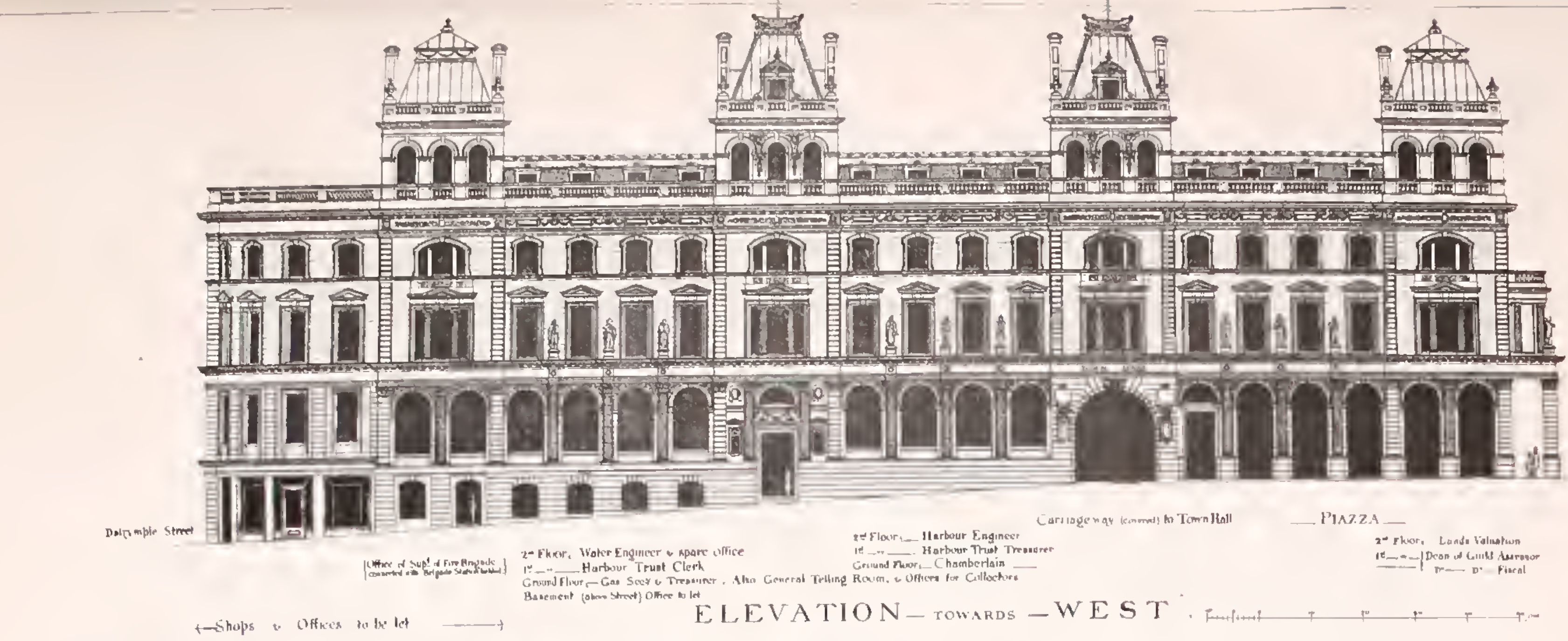


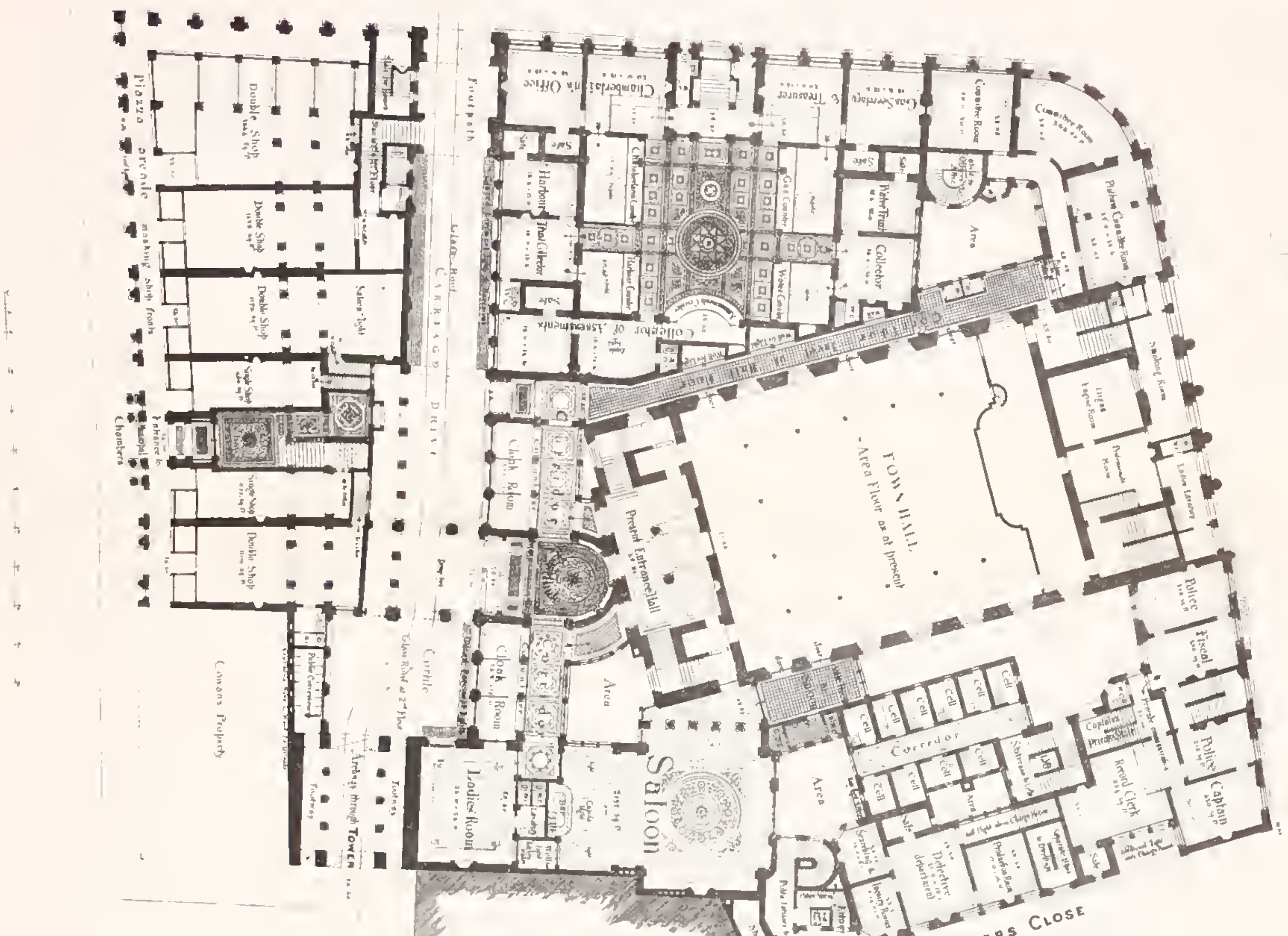
Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

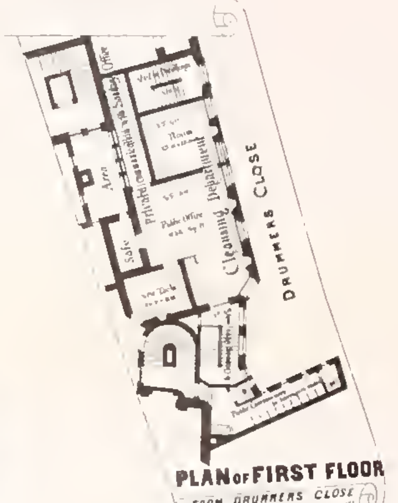


INTERIOR OF HOUSE, PARIS.

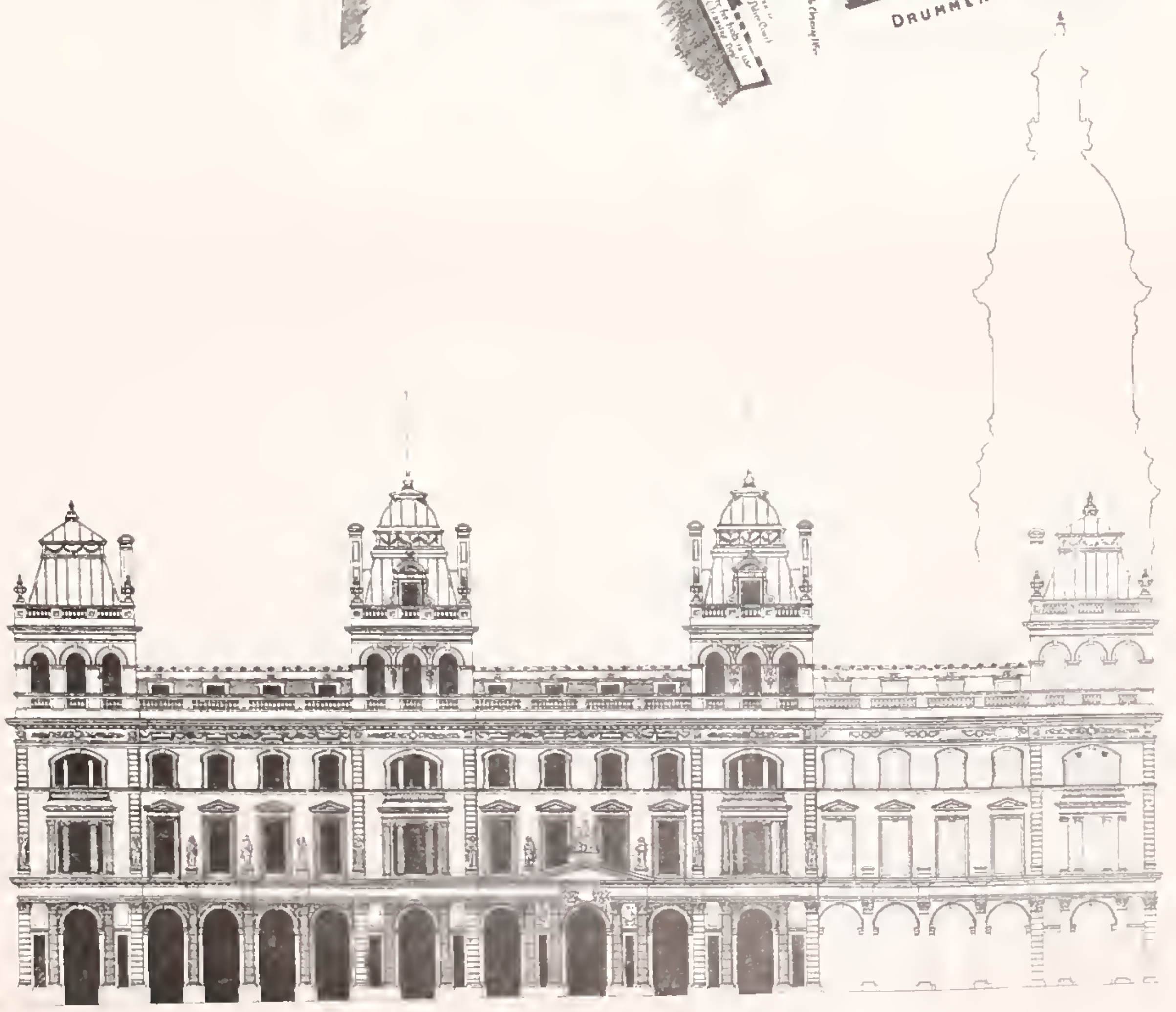

Dalrymple Street
Hamilton Street
Office of Supt. of Fire Brigade connected with Belgate Station
2nd Floor, Water Engineer & spare office
1st — Harbour Trust Clerk
Ground Floor, — Gas Secy & Treasurer, Also General Telling Room, & Offices for Collectors
Basement (above Street) Office to let
2nd Floor, — Harbour Engineer
1st — Harbour Trust Treasurer
Ground Floor, — Chamberlain
Carriageway (covered) to Town Hall
— PIAZZA —
2nd Floor, Lands Valuation
1st — Dean of Guild Assessor
Do — Do Fiscal
←Shops & Offices to be let →

ELEVATION— TOWARDS —WEST.

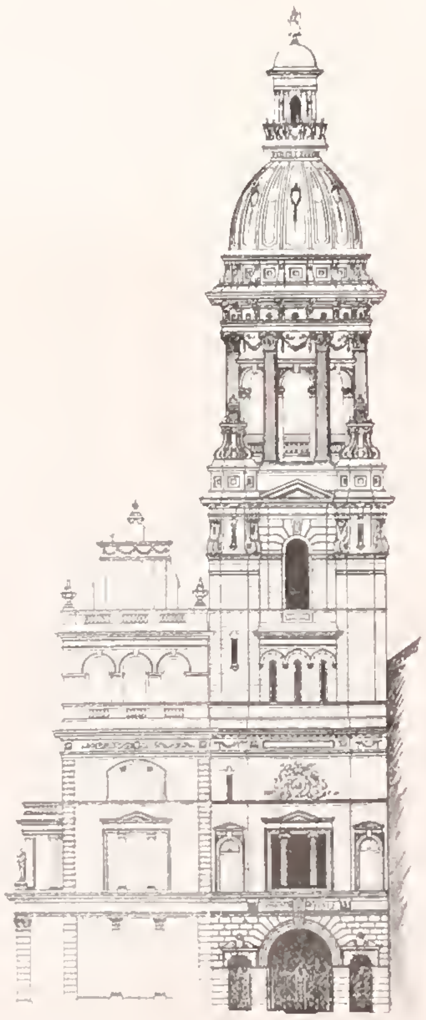




PLAN OF FIRST FLOOR
FROM DRUMMERS CLOSE
See Elevation & Drummers Close



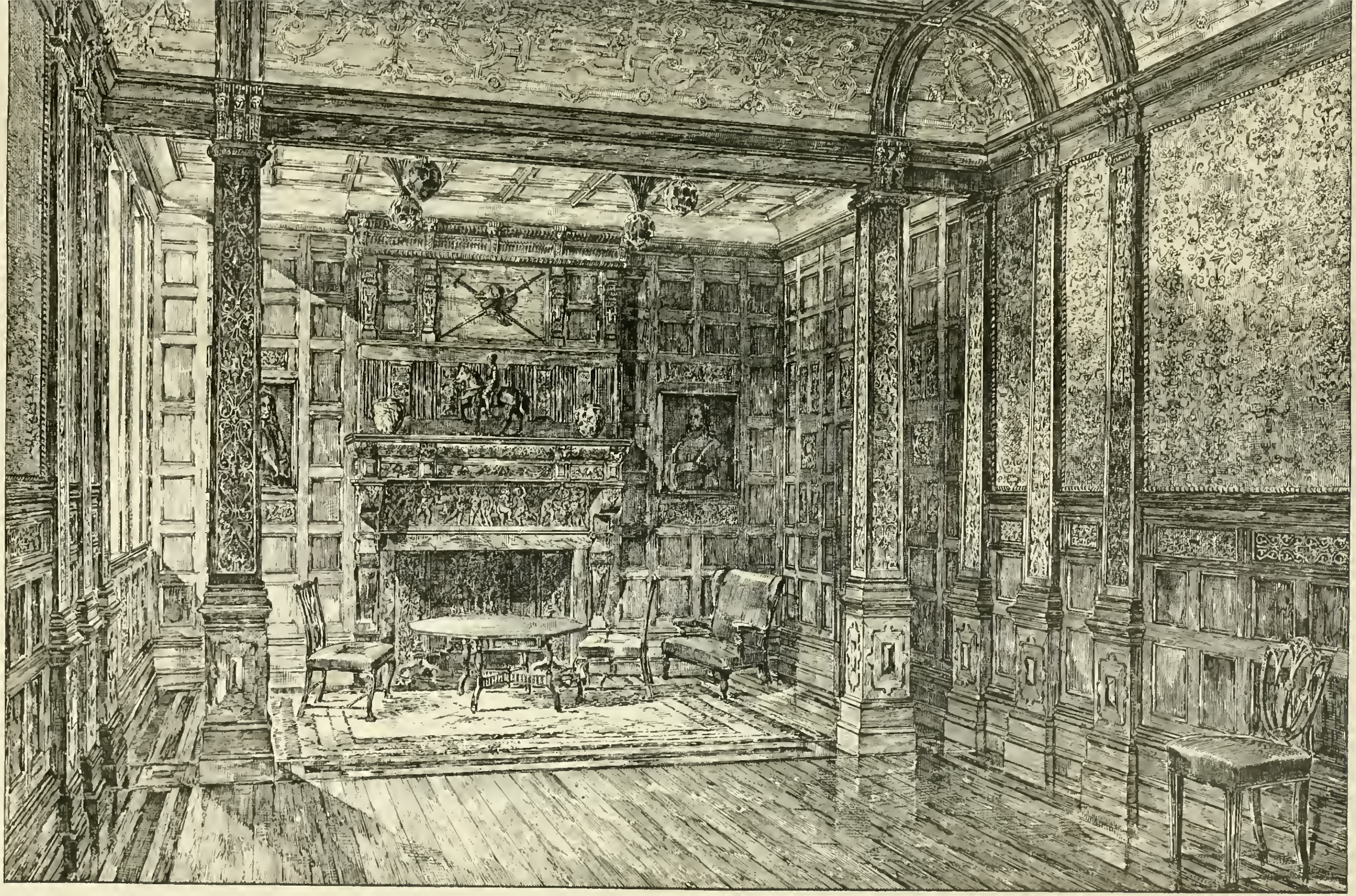
ELEVATION TOWARDS SOUTH — (HAMILTON STREET)



ELEVATION to CATHCART SQ.

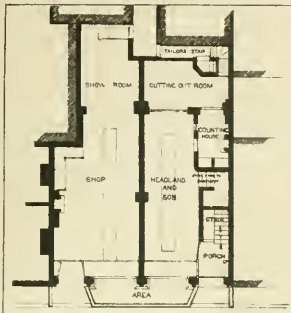
Photo-lith Stapled & Printed by James Akerman 6, Queen Square W.

MUNICIPAL BUILDINGS, GREENOCK. (SELECTED DESIGN.)
H & D BARCLAY, ARCHITECTS

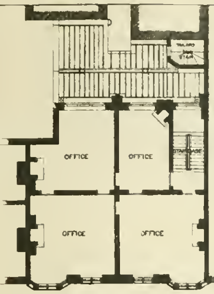


INTERIOR OF BILLIARD R^{m} S.JOHN'S WOOD W T.CUTLER, ARCHITECT

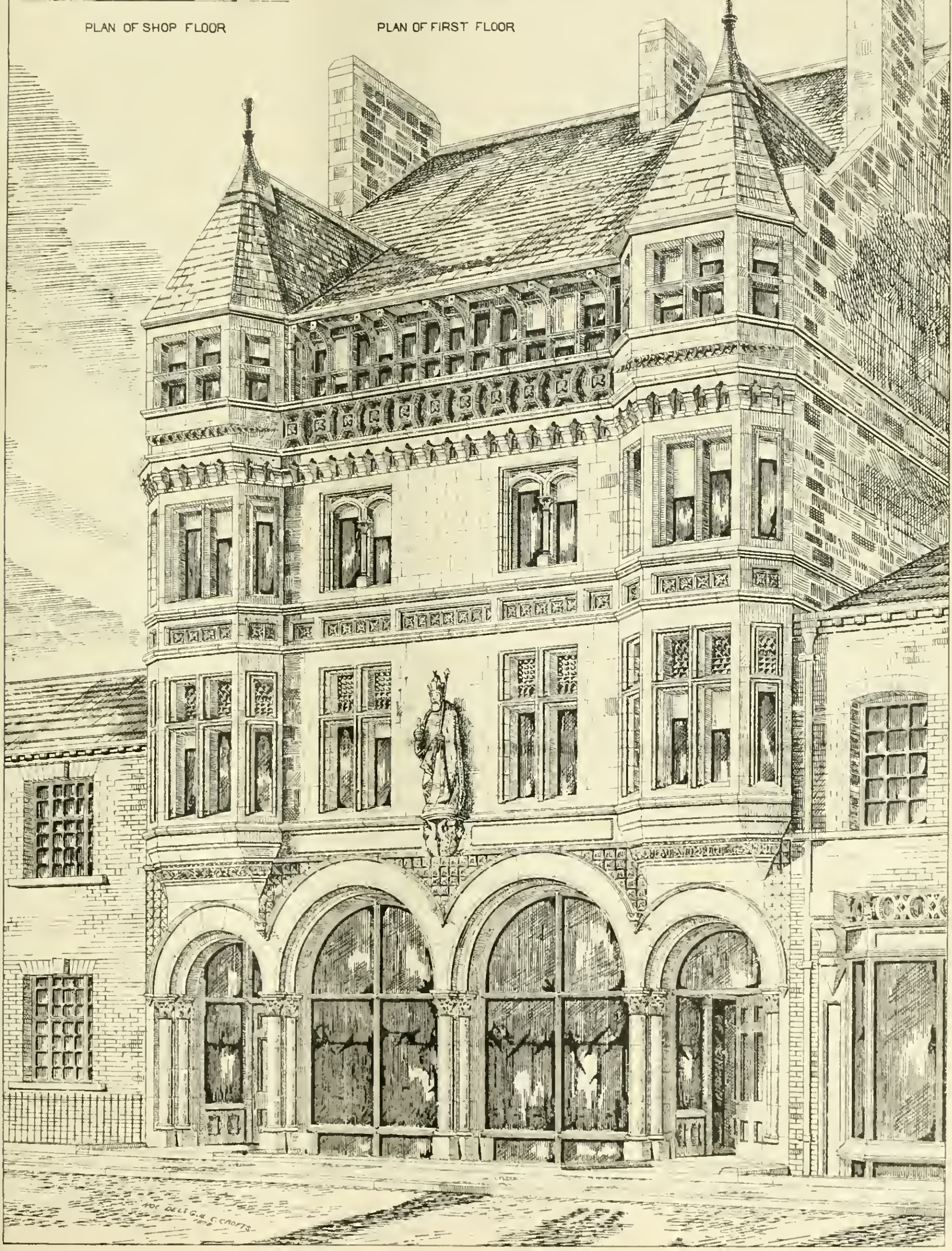
Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



PLAN OF SHOP FLOOR



PLAN OF FIRST FLOOR

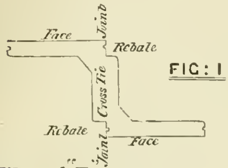

NOS DELT G. & C. CROFTS

J Akerman Photo lith London

LISH'S SYSTEM OF BLOCK BUILDING.

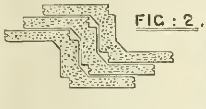
IN the Building News of May 23rd, 1879, we gave a photo-lithograph and a description of screw scaffolding, designed by Mr. Joseph J. Lish, of Bucklersbury, E.C., and Newcastle-on-Tyne, which attracted some attention, the illustration having been reproduced in America, and favourably commented on by several other journals. We now give illustrations of a system of Z block building patented by the same gentleman.

FIG: 1.



Plan of "Z" Block.

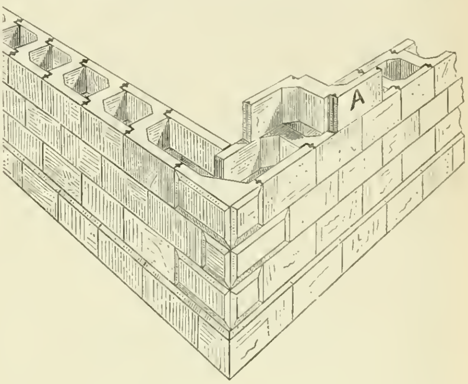
FIG: 2.



Mode of Packing for Transit.

FIG: 5.

Perspective View of "Z Block" Building.



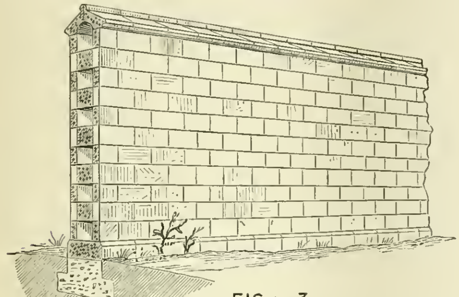


FIG: 3.

Wall built of "Z Block and Slabs."

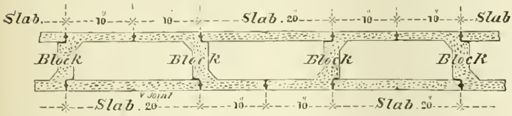
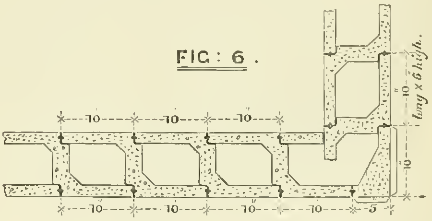


FIG: 4. Plan of Wall "Z Blocks and Slabs".

FIG: 6.



Plan of "Z Block" Building.

Fig. 1 shows a plan of the Z block, by which it will be seen that each Z block forms the two faces of the wall. The face portions of block are bound together by a solid portion (cross-tie), and rebates or checks are provided to receive the ends of the next blocks or slabs, as the case may be. The Z blocks are designed of such a size and weight as a workman can most conveniently handle.

Fig. 2 shows the Z blocks packed for transit by road or rail. They are so shaped and proportioned as to pack as closely as bricks, the faces and arrises fitting up to and protecting each other. These blocks, whilst producing hollow walls, obviate the loss of space during transit incidental to all systems of "hollow block" building; and a load of the blocks builds a greater amount of wall than a load of bricks.

Fig 3 is a perspectivo sketch of a fence wall built of Z blocks and slabs, finished with a moulded coping; and fig. 4 is a plan of such a wall. Every alternate Z block, in this case, is reversed, which allows of the introduction of slabs stretching from rebate to rebate of the blocks. This combination of the Z block with slabs meets a want where an economical wall is desired.

Fig. 5 is a perspective view, showing the corner of a building in which the Z blocks are employed with quoin blocks for the angle; and Fig. 6 is a plan of the same. For Z block building the tail end of one block fits into the rebate of the next, the course above breaking joint, the cross-tie or bonding piece stretching by this means from the centre of the face of one block to the centre of the face of the adjoining one (see "A," Fig. 5). Thorough bonding of the work is thus secured, and the strength of the wall equalised throughout. It will be noticed that when the Z blocks are used the joint in the facing comes opposite to, and is backed up by, a solid—that is, the cross-tie.

The following are some of the advantages claimed for this system, as compared with brickwork:—

1. That there is a considerable saving in the quantity of material employed, and consequently a corresponding saving in the cartage of such material.

2. That there is a large saving in mortar, not more than one-fourth of that used in ordinary brick-walling being required: giving a corresponding saving in the cartage on this item.

3. As the workman (see Figs. 4 and 6) builds both faces of wall in setting a block, greater rapidity of work is secured, together with a saving of labour.

4. The Z blocks are equally available for the construction of hollow or solid walls, as the spaces may be filled in, if desired, with a rough kind of concrete.

5. By this system the walls are thoroughly bonded throughout.

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THE SOCIAL SCIENCE CONGRESS.

THE Social Science Congress, which is this year held at Manchester, was opened on Wednesday. The President (the Bishop of Manchester) having dealt in his inaugural address at some length with education and kindred subjects, passed on to his second topic—questions affecting the health of our vast urban populations, or, as they are sometimes called by a hideous but convenient word, questions of sanitation. Good health in towns, he observed, may be said to depend upon four primary conditions—a good water supply, good drainage, good air, well-constructed and wholesome houses. I would premise that a great number of misleading ideas lurk under what I may call the "fallacy of averages." By the exertions of the two corporations, I believe that the death-rate in Manchester and Salford has been very sensibly reduced, and does not now exceed more than 20 or 22 per 1,000 under normal circumstances; and for some time past we have been wonderfully free from epidemic or infectious disease, But, as I have often heard the late Mr. Cawley M.P. for Salford, who from his knowledge as a civil engineer could speak accurately on the subject, state at meetings on sanitary subjects, while the rate of mortality in Higher Broughton, the salubrious level on which he and I lived, did not exceed 10 or 12 per 1,000, there were courts and alleys in Salford where it would rise as high as 60 or 70. And you lose this disparity of facts when you come to strike an average, which of course does not represent any actual fact at all. The chief difficulty in dealing with these great and important questions affecting the public health arises from the fact that municipal bodies and local boards rarely attack the evil till it has become intolerable; and, when they do attack it, they find it encumbered with so many vested interests, or acquired rights, that it is almost impossible to deal with it effectively, except at a cost which is enough to frighten them from dealing with it at all. It is this difficulty that has rendered the Act for preventing the pollution of rivers in many places practically inoperative. After referring to the pollution of the Irwell, the Bishop said:—With regard to the general water supply—whether for drinking or for household and manufacturing purposes—of our great cities, and indeed of the country at large, for there are small rural villages which have quite as great a difficulty in obtaining a sufficient supply of pure water as any of the great towns—I am entirely of the opinion that was expressed in a letter written in the course of last year by his Royal Highness the Prince of Wales to the Society of Arts, which excited a good deal of attention at the time, and which seems to be shaping itself into some practical convictions in the public mind. It is neither right nor wise that the present haphazard system should be continued; that great towns, on the principle of "first come first served," should be allowed to choose their collecting grounds for themselves; and it has become, if we are at all to consult the interests of posterity, a peremptory necessity that England and Wales should be divided into districts by competent authority for the sufficient supply of wholesome water for the populations residing in each. The story of Manchester and Thirlmere is well known and need not be repeated. Perhaps the ingenious suggestion that the scheme would improve Nature raised an unjust prejudice against it in the minds of sentimentalists and of my brother bishop, who was terribly afraid of the villainous villas that were to encircle the lake (though I am not aware that people consider even villainous villas to be an eyesore on the banks of the lakes of Como or Maggiore); but I think I can pretty confidently say, having inspected the spot carefully, and knowing that what is proposed to be done is simply to give a water surface of about 800 acres instead of the present one of barely 300—I think that I can say that Manchester's desire to secure a pure water-supply for its inhabitants is not vandalism, and that nature, whether improved or not, will not be disfigured by the operation. But I thought it was quite right that the House of Commons should require Manchester to consider the claims and needs of towns and places on the route of supply; though it certainly was rather hard in the stern Chairman of Committees in the House of Lords to refuse to allow the Bill to come before that branch of the Legislature in the Session of 1878, and to put the Manchester ratepayers to the delay and cost of another attempt, simply because, owing to the insertion of this new clause in the House of Commons, their Lordships' standing orders had not been, because they could not be, complied with. At last, however, Manchester has got possession of Thirlmere, and I hope and believe that it will use its possession wisely and liberally. I hope also that the good people under whose land the great pipes will pass, remembering that it is a public and not a private interest that is being served, will not deal too hardly or graspingly with us in the financial transactions that will necessarily accompany the operation. The drainage of a great city has a direct connection with its water-supply, especially if that supply is to any extent dependent on a river flowing through its midst, and the effect of supply on the drainage of a great city is still one of the gravest social and sanitary problems. The sewerage system of Manchester, which is rapidly advancing to completion, was recently described in an able and graphic letter in the *Times*, and the process pursued at the large municipal establishment at Holt Town is well worthy of the notice of members of the Association. The chief produce of this system is a concentrated manure suited for agricultural purposes, of which it is estimated that 20,000 to 30,000 tons can be produced in a year, and if sold at the low rate of £2 a ton would give a profit of 1s. 9d. to 2s. a ton. The gross annual expense of the night-soil department is between £60,000 and £70,000; and this profit, if attained, while it will dispose of refuse likely to be injurious to health, will also sensibly lighten the burden to the ratepayers. After mentioning other processes in use in other towns, Dr. Fraser continued:—The air we breathe, and the purity of which is so essential to our health, both of body and mind, is chiefly affected by ventilation of our houses and by the absence or presence of deleterious vapours and gases in the atmosphere. Smoke is not the only, nor I am told. the worst offender in this respect. The chemical, and particularly the sulphurous vapours that are given off, even when the smoke is consumed, are said to be more injurious to human life and more noxious to vegetation than those dense, black columns of unconsumed carbon which not only indicate our wasteful habits of consumption, but deface some of the most naturally picturesque districts in the land. Some few years back I was visiting the hematite ironworks at Carnforth, which at that time were in full operation. I was being shown over them by Mr. Barton, the manager. I noticed a thin column of white vapour issuing from the tall chimney; and I noticed also that the chimney itself was scarcely discoloured, though it had been discharging the duties of a chimney for many years. "Do you never give off anything worse than that"? I inquired of my companion. "Hardly ever," was his reply; "and the best of it is our consumption of our smoke saves us £30,000 a year"—I admit it was at the time when coal was at a high price—"in fuel." "How is it, then," said I, "that everybody does not follow your example?" "Oh," he said, "partly from want of proper looking into things, and partly because to produce this result requires a peculiar construction of the works, which, in the case of old establishments, may not be possible." I am not quite sure to what extent the mass of our working classes in Manchester are gainers by that displacement, by which they have been compelled to migrate from the centre of town to the suburbs. Externally, and while the houses are new, the gain looks considerable; and, of course, it is an immense benefit to the health and also to the morals of the community that the Corporation have succeeded in closing, I believe, every one of the cellar dwellings which once existed by hundreds, and which were centres of disease, and, partly as a result of the unhealthy conditions under which the people lived, of vice in so many forms. But an instructive pamphlet entitled "Urban Leaseholds" (Hodder and Stoughton, 1879), quoted in a recent pamphlet of the Howard Association, on the connection between overcrowding and crime, does not give a very cheering picture of these modern suburban "houses made of half-baked clay and mud and compo, with raw, shrinking timber, gaping joiners' work, foul chimneys, unsound roofs, damp basement rooms, and inefficient drains." "Ædiles," says the pamphlet from which I have taken this quotation, "are everywhere wanted. Not merely the existing public surveyors, but officers armed with effectual powers to prevent the erection of all dwellings unfit for human habitation, and to make fit those now unfit at the expense of the owners and builders. Deterrents should be raised against bad buildings." All I say is, for goodness' sake do not let us have a new set of officials. Arm those who exist already with effective powers if they do not already possess them. The Bishop quoted a communication he had received from Mr. Leigh, the Medical Officer of the Manchester Corporation, in which he summarised the work effected by the health committee, to show the work which such a body had to perform in a city containing 360,000 inhabitants. "These," concludes Mr. Leigh, with a just pride, "are some of the more important matters to which the committee have specially attended, and with the result of having lowered the mortality of the city to a very large extent. Typhus and typhoid fever, though not absolutely extinguished, are of comparatively rare occurrence, and nearly all other infectious diseases have been largely reduced in amount, while the general health of the people has been improved." Still, Manchester is not Paradise, nor even Arcadia. I do not even know that Dr. Richardson drew his vivid picture of the city of Hygieia from us. But people, I suspect, died in Arcadia and would die sometimes in Hygiæapolis; and if they die in Manchester it is not for want of that reasonable care being taken which may enable them to live. Mr. Leigh concludes his interesting letter with a few highly instructive remarks. Coming as they do from an officer of his ability and experience, I commend them very earnestly to the attention of the Congress. "The points," he says, "to which I would specially call attention are:—First, by legal action and the provision of adequate inspection to secure a better class of houses for the residence of the poor. The houses in the centre of Manchester, extending over an area of more than 600 acres, have been so far removed for the improvement of the city and the exigencies of commerce that the dwelling-houses only number on an average nine to the acre over this space. The remainder of the city, up to its boundary, is now nearly covered, so that any considerable increase of houses for the working classes connected with Manchester must be erected in the suburban districts. At present, the houses, as a rule, rise directly from the surface of the ground, without any intervening air space. The walls are excessively thin, and the mortar of the poorest quality. Such houses are necessarily damp, and must be productive of rheumatism, heart-disease, and bronchitic affections. An air-space at the basement should be insisted on, and means adopted for preventing the rise of moisture into the walls, which should be thicker and of better quality."

THE STUDY OF PURE AND APPLIED SCIENCE.

PROFESSOR Charles Graham, D.Sc., in his introductory lecture delivered at the reopening of University College, London, on Wednesday, urged the necessity for the earnest study of theoretical and experimental science, not alone upon the medical student, but also upon the young engineer and architect. Upon these classes of professional men it was increasingly necessary that they should devote a period of educational apprenticeship to mastering the accumulated knowledge acquired through a long series of experimenting and thoughtful inquiries by previous generations of workers, and that the information thus gained should be tested in the laboratory and workshop, proved to be accurate, and so made a part of themselves and available for use by the students. But if this study of pure and applied science was necessary for the engineer, architect, and doctor, it was indispensable to the manufacturer, if he would keep abreast of the times. To the twofold want of technical knowledge and the power to utilise the scientific information already possessed he attributed the fact that England was being supplanted by Continental nations in the markets of the world; our iron trade was in some measure lost, a part of our chemical manufactures was slipping from our grasp, the cotton and cloth industries were threatened. These losses were to some extent due to the high wages demanded by our workers, but also to the insufficient scientific and artistic training of those working at the heads of our manufactories. Schools of art and design were, he was convinced, meeting the latter want; but the former lack must also be supplied. He urged that it could only be done by subscription on the part of the State, wealthy corporations, or individuals; for laboratories, workshops, professors, books, and other implements were so expensive, that any remunerative fees would be simply prohibitive to all but those few who would not be under the necessity of following up their studies in after life. He admitted that not much could be expected from the State in the way of endowment. Some of the City companies had rendered valuable aid to University College and other institutions by grants towards scholarships and appliances; but if England was to take her former position amongst manufacturing nations, the study of technology must be supported by private subscriptions and contributions.

ANTIQUARIAN DISCOVERIES AT NEWCASTLE.

AT a meeting of the Newcastle-on-Tyne Society of Antiquaries, on Wednesday week, the Earl of Ravensworth presiding, Dr. Bruce read a paper giving an account of the Excavation of the South Gateway of the Roman station of Cilurnum, the modern Chester, on the line of Hadrian's Wall. The most important result of the excavation was, he said, the discovery of the fragments of two bronze tablets, giving the privileges of Roman citizenship and the rights of marriage to certain troops which were then serving in Britain. These interesting and important documents were found in the eastern guard-house amongst the débris, about 4ft. above the level of the original floor. On four previous occasions bronze tablets, or portions of them, have been found in England, conferring upon certain troops serving in Britain the rights of citizenship. Three of these belong to the reigns of Trajan and Hadrian, and are preserved in the British Museum. The earliest of them, which was found at Malpas, in Cheshire, bears date A.D. 104. The fragment of another tablet of like character seems to have been found at Walcot, near Bath, in 1815. These tablets are generally called *Tabulæ Honestæ Missionis*, because, in addition to conferring the citizenship and the right of marriage, they testify that the individuals obtaining it have completed their full term of military service, and have obtained an honourable discharge. Those now noticed consist of three pieces. One considerable piece and a small fragment are parts of one diploma. Another small fragment belongs to a different diploma. Careful search has been made for the other of these diplomas, but in vain. When the tablets were discovered scarcely a letter was distinctly legible. As the documents promised to be of much importance, we did not venture to remove the oxide of copper and earthy matters which covered the plates, but sought the aid of Mr. Ready, of the British Museum, an operator of great skill and experience. Every letter is now perfectly legible, and though we have only one leaf of the principal diploma (and some portions of it are wanting), we are able, with a single exception, to make out the names of all the troops mentioned in it. The following is a literal translation of the document so far as it can be made out from the one side and the other:—"The emperor Cæsar (son of the deified Hadrian, grandson of the deified Trajan styled Parthicus, great grandson of the deified Nerva), Titus Ælius Hadrianus, Augustus, Pius, chief priest, invested with tribunitian power for the ninth time, declared Imperator for the second time, consul for the fourth time, the father of his country, to the cavalry and infantry, in three alæ and eleven cohorts, which are named the (ala) Augusta Gallorum Proculeiana (the imperial regiment of Gallic cavalry surnamed the Proculeian) and . . . . and the first ala of Celtiberians, and the first cohort of Spaniards and the first of Dacians styled the Ælian, and the first cohort of Marines styled the Ælian, and the first of the Varduli surnamed the faithful, and the second of the Gauls, and the second and sixth of the Nervii, and the third of the Bracarians, and the fourth of the Lingones, and the fourth of the Gauls, and are in Britain under Papirius Ælianus, who, having completed twenty-five campaigns and obtained an honourable discharge, whose names are written below, whoever of them does not already possess it, has granted the rights of Roman citizenship and marriage with the wives whom they may have when the citizenship is given, or if any of them are unmarried, with those whom they may afterwards take, provided each have one only." Here the document ends. If the remainder of the plate had been found, it would have given us the day of the month on which the edict was issued, together with the names of the consuls for the year. We know, however, the year. Antoninus Pius possessed the tribunitian power for the ninth time, was imperator a second time, and consul a fourth time in A.D. 146. All the troops mentioned in this tablet we have met with before, either upon other diplomas, or in lapidarian inscriptions, with the exception, perhaps of the first, the *ala prima Augusta Gallorum Proculeiana*. Of the troops mentioned in this diploma as being in Britain in the year A.D. 146 it is worthy of notice that five of them (one *ala* and four cohorts) came from Spain, four (one *ala* and three cohorts) came from Gaul, and two cohorts came from the modern Belgium. One cohort, the Dacian, came from the east of Europe, the country now occupied by the Wallachians and Bulgarians. Another fact of interest respecting the troops mentioned in our diploma is that we have proof that one-half of them remained in Britain until nearly the close of the Roman occupation of the island. The Chester tablet reveals to us the name of a governor of Britain of which we were ignorant before. Near the close of the inscription we have the words *sub Papirio Æliano*. Before holding the office of Legate Papirius Ælianus must have served the office of consul. His name, however, does not occur in any existing list of consuls. In the year A.D. 184, a person named Cneius Papirius Ælianus appears in the consular list. It is quite possible that this person may have been a son of the British Legate, but we have no direct information respecting the Legate himself beyond what this little fragment of bronze affords us. The excavator, on raising with his spade this tablet from the bed where it had lain for more than a thousand years, little thought that he was rescuing from absolute oblivion the name of so important an official as Papirius Ælianus, the imperial Legate. In addition to the tablet which we have discussed, a small fragment of another has been found, which is possibly part of a duplicate copy of this one. It certainly belongs to the reign of Antoninus Pius, though nothing else can be discovered respecting it.

THE SEVERN BRIDGE.

THE bridge across the River Severn is now completed, and it is intended to have it publicly opened on the 17th of October.

The engineers who promoted the scheme of the bridge railway, designed the bridge, and carried out the work, are Mr. George William Keeling, M. Inst. C.E., Lydney, and Mr. George Wells Owen, C.E., Westminster; the consulting engineer being Mr. Thomas E. Harrison, M. Inst. C.E. The contracts were signed as follows:—The bridge to Hamilton's Windsor Iron Company, Liverpool, £190,000; and the railway, with viaduct, £90,000 to Messrs. Vickers and Cook, London, who by arrangement gave up the completion of the contract, viz., the railways, and that portion of the undertaking has since been carried on by Mr. Griffith Griffiths, of Dean Forest. Some time elapsed after the Parliamentary powers had been obtained before the starting of the works, mainly from the high prices and expensive labour then prevailing. The foundation stone was laid on June 3rd, 1874.

The bridge is on the bowstring principle, and consists of the following spans:—One of 134ft., two of 327ft., 5 of 171ft., 13 of 134ft., and one —including a swing bridge over the Gloucester and Berkeley Canal—of 196ft., making 22 in all. The two spans of 327ft. are across the navigable part of the Severn, and in ordinary spring tides afford a headway of 70ft. above high-water mark. In the other cases the headway varies according to the gradient of the bridge—1 in 140. The piers, moreover, vary according to the weight they have to carry. Those bearing the wider spans consist of four cylinders, each of which is 10ft. in diameter from the foundation to low-water level, and 7ft. to the top of the pier, and upon which the girders take their bearings. The piers of the five 171ft. spans consist of two cylinders only, each 9 feet in diameter to low-water mark, and from thence 7ft. The width of the river is 1,186 yards, and the entire length of the bridge, inclusive of the viaduct on the Forest shore, and the swing bridge across the canal, is 1,387 yards. It has been constructed for a single line only, although the railways, including the tunnel, have been made for a double line of rails. The total length of railway from Lydney, where the line commences, to Sharpness is about five miles. The superstructure of the bridge consists of bowstring girders resting on iron columns, and to allow of vessels passing up the canal the structure terminates on the Sharpness side with a swing bridge 500 tons in weight and about 200ft. in length. It has a double opening, and rests upon a circular tower of masonry. One of the openings of the swing bridge is across the canal, and the other over the adjoining shore of the river, The engine and machinery for turning the bridge are so arranged that there shall always be a reserve boiler, engine, and machinery, to provide for repairs or in case of a breakdown. The locking is effected by iron wedges driven by steam, lifting the bridge, and causing it to take a solid bearing on the piers. The viaduct on the Lydney side of twelve arches 70ft. high, constructed of stone from the Forest of Dean, is a fine piece of masonry.

The scaffolding used in the bridge was, from the nature of the undertaking, peculiar, and the details of the temporary structure are of interest. Before starting the piers the contractors had, during the neap tides from barges, which were fixed, to drive three rows of piles. As soon as they had been driven a scour was caused, which carried away all the sand in the bed of the river in their immediate vicinity, leaving bare the clay and gravel, of which there were about 8ft. in depth on the rock. Then the piles were braced together, an operation which had to be performed by divers, as the necessary work must be done beneath the low-water level. If the piles could not be braced together before the spring tides came all was swept away, and the task must be commenced afresh. With favourable weather, however, the men succeeded in this portion of the preliminary work, but the force of the tide was so great that to give the stages sufficient stability to resist it they were built 150ft. in length, although the piers were only 20ft wide. After the scaffolding thus far was completed, a framework was formed on the top just large enough to take the cylinders and the upright guides requisite for preserving the cylinders in position as they were lowered. When the framework was ready the cylinders were brought to the spot in 4ft. lengths, and fastened together by flanges and bolts inside. The lengths were placed inside the framework and lowered by means of long screws, having links attached, and as one length disappeared below the top of the framework, a second was bolted on, and the lowering process continued. As the screws ran out they were taken off, and links 6ft. long attached. Thus the lowering process went on, length being added to length, until the cylinder reached the level of the clay and gravel; and when this point was attained, men in the ordinary diver's dress descended, to excavate a hole that the cylinder might be steadied. Then the cylinder was built up by adding 4ft. lengths until it appeared 15ft. or 20ft. above high water. The next process was to fix an air bell to the top. This was bolted on so that it formed a chamber from the air bell to the bottom of the cylinder; and an engine and air-pump being brought out, air was forced into the cylinder until all the water was thrust out of the bottom. Through pressing air into the cylinder, much increased flotation was given to it, and this rendered it imperative to load the cylinder in order to overcome the buoyancy. That each cylinder might be kept down it was loaded with about 150 tons of iron rails. The men at work had to pass into the bell through an air trap which gave admission to an antechamber, the outside door then being closed, and as soon as the compressed air in the antechamber became of the same density as that in the cylinder communication was permitted from the ante-chamber. In this manner also the excavated material was passed out and concrete and bricks as needed passed in. When the water had been forced from inside the cylinder a man descended and excavated the clay, the cylinder dropping gradually as the excavation went forward, until it reached the rock. Then the rocky bed itself was excavated to the depth of 4ft.; and as soon as the engineer was satisfied of the firmness of the foundation the cylinder was filled with concrete, and the piers carried to their full height, being loaded with concrete to the top. On the top of these columns of concrete the weight of the bridge was supported, the iron cylinders being merely a casing.

A task of some difficulty was that attending the construction of the scaffolding for the two large spans; and after some consultation the contractors decided to have three temporary piers of scaffolding between each of the two wide spans, and these trussed. The men had to rely entirely on wood to carry up the intermediate stages, and it was necessary to have a base of 150ft., using 34 large balks of timber from 55ft. to 60ft. in length, and averaging 16in. square, to form the bays of the intermediate stages. As a start the pile-driving apparatus was placed in position, and three piles were driven if possible during low water. These three piles were then braced together to assist each other in resisting the pressure of the water until the remainder could be driven. As the process of driving advanced, the piles were continually braced from tide to tide until 34, forming one intermediate stage, were driven. When a sufficient number of piles had been driven the diver put on the bracings, which consisted of half-timbers varying from 50ft. to 80ft. in length. To get these as close to the gravel as possible efforts were made with slip channel iron arrangements, and they were bolted. The bolts in connection with the channel irons were closed by divers, and this bracing was fixed to the other piles by 1¼in. bolts. These piles were only sufficient to bring the base of the stage to low-water mark; and after the whole of the under-water work was thoroughly braced, arrangements were made for carrying the scaffolding to its required height. It was necessary in the two outer rows to have the piles doubled, in order that sufficient strength might be afforded to support the immense weight of the superstructure. These double piles were carried up so as to receive the end of the temporary trusses on which planks were laid to form a continuous platform. It was only at extreme low water that the bases of these stages could be put in; but by means of the electric light the men could work every tide until the stage was brought to high water, there being a spring tide every fortnight.

TOUGHENED GLASS AS A PERMANENT-WAY MATERIAL.

THE application of toughened glass as a material for permanent-ways is being watched with considerable interest. A paper on the subject was read on Friday last, at Liverpool, before the Iron and Steel Institute, by Mr. C. Wood, who said the invention would be looked upon with considerable interest, not only from its great novelty, but because it might have some effect upon the iron industries of this and other countries. He meant the application of toughened glass to sleepers and chairs for railways or tramways. Mr. Hamilton Lindsay Bucknall, the inventor of the new application, had given him some particulars concerning his glass sleepers. The glass was moulded into various forms to suit the different requirements, the cooling of the glass being so regulated that the radiation from each point of the surface corresponded to the thickness of the glass, thus enabling the casting to be equally affected throughout when undergoing the tempering or hardening process. The mode of toughening the glass was both curious and instructive, affording as it did a complete contrast to that of steel. The glass was heated to a high temperature, and then plunged into a bath of cool oil or other liquid, the result being that the glass became converted from its own characteristic brittleness to the remarkable tough fibrous material known as toughened or tempered glass, but to produce the desired effect and obtain the full advantages of the toughening process upon articles of great strength and thickness, Mr. F. Siemens had found that the hardening or tempering could be effected in the moulds. The first cost of this specially prepared material would not exceed that of cast iron, but the specific gravity of glass was only one-third that of iron, and its strength for all practical purposes was as great. A large out-put was anticipated, and in this way it was calculated that the first cost of glass would be considerably less than that of iron; and, by a similar calculation, could be shown to be cheaper than wood. It was asserted that these glass sleepers would, as far as one was able to judge, last a very long time, being neither subject to corrosion nor decay. The qualities of glass certainly deserved a fair trial and investigation, and the time might come when we should see not only glass sleepers, but glass tools and implements, eaves troughings, or spouting, glass furniture, and many other things. Some of these glass sleepers were laid down upon the North Metropolitan Tramways. A weight of 9cwt dropped from a crane 17ft. high on a glass plate 9in. × 9in., and $1\frac{1}{8}$in. thick, laid upon gravel ballast did not break it, but it succumbed to a fall from 20ft.

Mr. Bucknall, London, said he had just heard that the glass sleepers laid on the London tramways were standing as well as the ordinary ones, several loads of fifteen tons, drawn by traction engines, passing over them frequently without doing them any damage.

CHIPS.

The interior of the 13th-century Cockayne Chapel at the parish church, Ashbourne, has just been completely restored. The plaster has been removed from the walls, which are composed of white and red sandstone, richly and irregularly placed. The chapel is now completely occupied by monuments of the families of Cockayne, Bradburne, and Boothby, and these, and its old screen of carved oak, render it the most interesting feature of the church. The parish churchyard has been fenced with light ironwork, this last work being carried out by Messrs. Baldwin and Ormes, of Ashbourne.

A tower is being added to the modern church of St. Philip, Heigham, an increasing suburb of Norwich. The contract has been taken by Messrs. J. W. Lacey and Co., of Norwich.

An Oddfellows' and working men's hall is about to be built on the site of the Old Castle buildings in South-street, Bridport. Mr. R. Cormick is the architect, and the contractors are Messrs. T. and F. Patten.

The new auxiliary waterworks at Heanor, Derbyshire, which have occasioned much difficulty and expense to the local board, have at length been completed, and the contractors for the engines, Messrs. Worsop and Hill, of Nottingham, have received the order to proceed with the work.

At Bridgwater new waterworks are being erected by Mr. Chamberlain, contractor, and board schools are in course of building in Albert-street; for the latter Messrs. Chedzoy and Sons are the contractors.

Building Intelligence.

Bristol.—The erection of the new Church of St. Werburgh, Bristol, has been completed, and the building was consecrated on Tuesday. The length of the new church is 79ft., being 19ft. longer than the old one; but the breadth is the same, namely, 59ft. It consists of a nave, north and south aisles, chancel, organ-chamber on the south side of the chancel, vestry on the north side, western porch, and tower. The chancel is 20ft. wide and 25ft. long, and is paved with encaustic tiles. The roof is of pitch-pine, boarded and ribbed, with bosses at the intersections. The reredos is stencilled to give the effect of panels, in which the Decalogue and Creed are painted in illuminated characters. The altar-rails are of pitch-pine. The nave is paved with tiles in geometric patterns, and is seated with pitch-pine open benches to accommodate 650 worshippers. The glazing was carried out by Mr. Ben Gay, of Easton-road, Bristol. The exterior of the building is of freestone; the roof is covered with Broseley tiles, and the interior of the roof is of varnished pitch-pine. The church is lighted by nine gas coronas, supplied by Messrs. Jones and Willis. The contract has been carried out by Messrs. Wilkins and Sons. Mr. J. Bevan is the architect.

City. — The Manchester Hotel, opposite Aldersgate-street railway station, was opened for business on Wednesday. It is Late Perpendicular in style, of red brick with stone dressings. It is of six floors, and contains 240 bedrooms, all furnished alike, and all having cemented walls, coloured with light green paint. The kitchen is placed below, contrary to the rule of modern hotels, and special measures are taken to remove culinary vapours. The smoking room has a glass domical skylight, and the broad leather spring seats are so arranged as to enable parties of six or eight to sit *tête-à-tête*. There are two billiard rooms, one for visitors, the other public. The cost of the hotel, including furniture, was £70,000. Messrs. Bateman and Corser, of Birmingham, were the architects; Mr. William Brass, of Old-street, was the builder, and the furniture was designed and manufactured by Messrs. Brew and Clarke, of Finsbury. Messrs. Worrall and Stephens executed the decorations throughout. The gas, water, and electric-bell services have been made by Messrs. Strode, of Osnaburgh-street, and the bedsteads, which display much brass, are by Messrs. Peyton and Iles, of Birmingham.

Doddiscombsleigh, Devon. — Doddiscombsleigh Church, near Exeter, was reopened on the 25th ult. It is Perpendicular, consisting of nave, chancel, north aisle, porch, and west tower. The nave and chancel walls have been rebuilt, and new roofs put on; the aisle roof renovated; the arcade and windows have been repaired; Minton tiles laid in the chancel; the tower with its granite arch and west window have been opened and repaired; the Norman font repaired. In the aisle are five three-light windows containing ancient stained glass. These have been restored with much new work gratuitously by Messrs. Clayton and Bell. The walling has been done by Mr. Mayne, of Kenn; freestone work by Messrs. Easton and Son, Exeter; the carpenter's work by Mr. Diggines, of Doddiscombsleigh, who has managed the work generally under Mr. Ashworth, architect, of Exeter. The outlay has been about £900. The reseating is not yet done.

East India Docks.—The foundation-stone of a new church in South Bromley was laid by Lord Selborne on Monday. The site is between Athol-street and Barking-road, close to the East India Docks. The church is to be in the Early English style from designs by Mr. Ewan Christian, architect to the Ecclesiastical Commissioners, and the builder is Mr. George Shaw. Accommodation for 800 people will be provided, and there will be a parsonage and a parish-room. The site has cost about £2,700, and the estimated outlay, including this, is put at £14,700.

Little Bradley.—The restoration of the interesting church of All Saints, at Little Bradley, near Newmarket, has just been completed. The work has cost £900, and has been carried out, under the direction of Mr. W. M. Fawcett, M.A., of Cambridge, by Messrs. Mason and Son, of Haverhill. The roofs are entirely new, and are of pitch-pine, that of the chancel being stained and oiled. The stucco which disfigured the walls and also the round tower has been removed, the masonry repointed and, where defective, replaced. A porch has been added. Within, new low benches take the place of ugly pews, the floor of nave is retiled, the sacrarium is paved with patterned encaustic tiles and inclosed by altar rail; there are also new pulpit, reading desks, lectern, screen, and heating apparatus. Several stained windows have been erected by Messrs. Heaton, Butler, and Bayne, of Garrick-street, London: that at the east end represents the Crucifixion, on the north side of chancel is "The Holy Family," a smaller one shows "The Tokens of the Passion," while in the nave is one depicting "The Sermon on the Mount." The most interesting of the ancient memorials in the church is a brass erected in 1584 to John Day, the printer of Foxe's "Book of Martyrs," and, as this tablet informs us, the suggester of the compilation.

Metropolitan Board of Works.—This Board resumed its sittings on Friday. Mr. Lowman Taylor called attention to the proposed erection of a new building at the corner of Bell-yard, and expressed his surprise that Mr. Street, the architect of the new Law Courts, had sanctioned the re-erection of a building on the same site which would project 10ft. beyond the line of the Law Courts. He would refer it to the works committee to confer with a committee of the Commissioners of Sewers on the matter with a view of setting back the premises in line with the Law Courts. This was carried. For the formation of the roadways of the Union-road portion of the Jamaica-road and Union-road, Rotherhithe improvement, the tender of Mr. Thomas Turner, of King's-road, Chelsea, viz, £1,300, the lowest of three received, was accepted. Amongst the Acts that were reported by the solicitor to have received the Royal assent at the close of last session, and which were referred to the engineer and to various committees to examine and report upon, were the following:—Metropolitan Management (Thames River, Prevention of Floods,) Amendment; Artisans and Labourers' Dwellings Act, 1868, (Torrens' Act) Amendment; Artisans and Labourers' Dwellings Improvement Act, 1875, Amendment; Deptford Tramways; Leadenhall Market; West Kent Main Sewerage Amendment, and Metropolitan District and Metropolitan and other Railway Companies Acts. A letter was received, announcing the death of Mr. W. Newall, late principal clerk in the superintending architects' department. The Chairman remarked upon the long and faithful services of Mr. Newall, and expressed regret that no grant could be made to the widow, who is now maintained in an asylum in Scotland. Sir H. A. Hunt transmitted copies of his final awards in the High-street, Islington, and Whitecross-street, St. Luke's, improvement schemes. It was reported that the Local Government Board had confirmed the Board's new by-laws for regulating the conduct of the business of glue and size manufacturers.

Solihull.—The ancient parish church of Solihull, of which the existing chancel was erected as early as the 13th century, has undergone extensive repairs during the past year, and was reopened on Tuesday. The roofs of the aisles have been rebuilt and materially strengthened by the introduction of tie-beams, posts, and struts. The main roof of the nave has been retiled, the timbers, where necessary, including the whole of the outer wall-plates, have been renewed, while the west window and the gable above it, together with a large portion of the wall at the north-west angle of the church, have been rebuilt; the tower and the spire also have been thoroughly repaired and strengthened. In the interior a great change has been effected by the removal of the large gallery, which extended across the west end of the nave; low open benches also have been substituted for the old pews, and so arranged as to afford great additional accommodation. The old oak panelling, however, probably of the date of James II., has been preserved. The repairs have been executed by a local builder, Mr. Charles Bragg, under the general directions of Mr. E. Holmes, architect, Birmingham.

Sudbourne.—Through the liberality of Sir Richard Wallace, the parish church of All Saints, Sudbourne, near Orford, East Suffolk, has been almost rebuilt. The church was a small structure with traces of every period from Norman to Late Perpendicular, and in 1851 it underwent considerable repair. Upon removing the plaster from the outside facings, some interesting ancient features were discovered, and these have been carefully preserved and made secure. On the south side there was a remnant of an old Norman doorway, partly in good preservation. On the same side there is a small Early English lancet window. The walls throughout have been cased on the outside with a thickness of rubble stone, bonded into the old work, which is chiefly formed of the crag of the locality. The inside walls have been also recased and replastered. An addition has been made on the north side for an organ-chamber, and a corresponding addition on the south side forms a transept. The roofs of the nave and chancel are entirely new, and are formed with hammer-beam arched principals of uniform width, the whole lengths of the ceilings from east to west being boarded with varnished pitch pine. New benches are provided throughout, and the passages are paved with ornamental tiles. The old pulpit of carved oak is retained, having been repaired and set upon a stone base. The font, which is Norman, but much mutilated, is fixed upon four shafts worked from old parts that had not been destroyed. The walls of the tower have also been thoroughly repaired, and are battlemented with tracery of stone, filled with rubble panels, instead of the old brickwork formerly in existence. Sir Richard Wallace has also given a new organ, built by Messrs. Gray and Davison, of Euston-road, London, and a handsome stained glass east window, representing Faith, Hope, and Charity, executed by Messrs. Gibbs and Co., London. An elaborate monument of the Elizabethan period, to the memory of Sir Michael Stanhope, an ancestor to the present Earl Stanhope, who ordered it to be thoroughly restored and re-erected, now occupies its original position on the north side of the chancel. The whole of the work was undertaken by Mr. R. S. Smith, builder, of Ipswich, from the designs and under the direction of Mr. Frederick Barnes. The masonry work was entrusted to Mr. Frewer, of Ipswich.

Whitestaunton. — The parish church of Whitestaunton, Chard, was reopened last week after restoration. The church consists of a nave, chancel, aisles, and western tower. Originally the chancel aisles were chantry chapels. The present church is entirely of 15th-century work, and is probably built upon the lines of a church of much earlier date. The only remaining fragment of the earlier church is the font, which is of the Norman period. The restoration work consists of part rebuilding of the chancel walls, repairs to the windows, new roofs to the nave and chancel, new floors, seats, &c. The restoration, which has been carried out under the direction of Mr. Sedding, architect, of London, has cost about £600.

York Minster.—About the middle of 1877 a reredos was erected at the eastern end of the choir in York Minster. The reredos, which is an oak one, is in the form of a triptych, and occupies the centre of the stone altar-screen of eight bays. The triptych is in the Perpendicular style of architecture, to harmonise with the choir, and has been designed by Mr. G. E. Street, R.A. A few days ago the centre of the middle compartment of the tripytch was filled in with a representation of the Crucifixion, in terra-cotta, about 11ft. long by 4ft. high. The artist, Mr. Tinworth, has chosen the scene about the Cross at the third hour. The central figure is that of our Saviour, who has just been raised upon His Cross, and on each side Roman soldiers are in the act of nailing up the two thieves. At the foot of the Cross two Roman soldiers are casting dice upon a shield for the Saviour's robe, while two others are seen in the act of dividing His garments. On the left are seen the three Marys coming to the Cross weeping, while two Roman soldiers stand guard over the central figure. The Roman centurion is just riding up on the extreme left. Messrs. Doulton and Co., of Lambeth, have had the work in hand.

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The town council of Preston, at a special meeting, have accepted the terms under which the Harris trustees offer a grant not exceeding £70,000 for the erection and maintenance of a free library in Preston. It is proposed to expend £50,000 on the erection of buildings.

More than Fifty Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation render its the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.C.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J, Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line of eigh words (the first line counting as two). No advertisement inserted for less than half-a-crown. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisment inserted for less than 5s.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

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(Payable in Advance.)

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Cases for binding the half-yearly volumes, 2s. each.

Received.—L. and N.—V. Bros.—L. and W.—W. G.—J. R. and Co.—T. P. L.—G. B. and L.—P. and S.—L. B. Co.—L. P. Co.—B. T. Co.—J. J. C. and Co.—J. and Co.—E. C.—S. L.—T. R. and Son.—J. C. Son.—W. O. C.—S. S. B.—J. M.—J. W.—V. T.—A. and C. H.

W. G. (Write the Secretary at Burlington House.)—A. B. (We never heard of any other. The institute examination is the only one legally necessary.)—Kappa. (1. Joists that run through and form the floor of two rooms always conduct sound more than when they are cut off at the plate. 2. We hardly know what you mean by "clay lumps" used as internal walls. Clay does not conduct sound very freely. 3. A battened wall improves the sound or sonorous properties. We are of opinion that the chief cause of the conduction of sound in the house mentioned is the continuity of the joists and the want of pugging.)

"BUILDING NEWS" DESIGNING CLUB.

Spero. (The club is open to all. In answer to your second question, we should think so.)—F. W. G. (The conditions and rules of the new series will be published next week, when the first list of subjects will be given.)

OUR COMMONPLACE COLUMN.

Notes and quotations upon subjects in J and K will be received on or before next Wednesday week.

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Correspondence.

NEWARK HOSPITAL COMPETITION.

To the Editor of the Building News.

Sir,—Some seven or eight years since I remember reading some satirical papers in one of your contemporaries, entitled "How to Win a Competition. By a Winner." On perusing the remarks of "Looker-on," anent the above, it occurred to me he also must have read them, and mistaken the advice contained as serious, whereas they described the *abuse*, and not the proper *use*, of competitions; or else your correspondent would scarcely have published his opinion "that the Committee have acted *very wisely* in calling in professional advice to report on the merits of the plans irrespective of cost [*a most important feature of the competition*], and reserving to themselves the right to award the prizes as they may think fit." I was not aware any prizes were offered!

With all due diffidence to such an anonymous authority, "who (with one exception) is acquainted with the whole of the competitors" (save me from my candid friend!) I repeat, at the risk of being accused of "being very sore upon this point," that I consider the Committee or Governors would be guilty of monstrous injustice and wanton breach of faith to the other competitors, to be guilty of such a very dishonourable proceeding. When the plans were received the governors held a meeting, at which the question of *cost* was discussed, and they stated most positively "that no plan would be accepted that exceeded the stipulated cost." I therefore contend that if none of the plans submitted can be executed for the stipulated amount in "the instructions" (but I have yet to learn that such is the case), the competitors could not complain at their plans being rejected. Mr. Hine stated candidly his could not be, and it would have been more honourable if two or three others had done likewise; but I cannot believe that you, Sir, will lend your powerful advocacy, and stultify the previous history of your valuable journal, by agreeing with the doctrine advocated by "Looker-on," which, carried to its natural conclusion, is nothing more nor less than "the obtaining of plans by false pretences," and I blush to think that any right-minded *professional* man would advocate such a conspiracy as this, for committees to depart and cast aside their specified "instructions" issued for the competitors' guidance; the majority of committees are not insensible to the effects of *private influence*, and every few weeks adds testimony to the wanton and unfeeling manner in which these dignitaries conduct the business they have pledged their honour to transact in good faith and justice.

If the Medical Staff (certainly no mean authority), and who, to my certain knowledge, have for the past two years visited other hospitals, &c., and who have carefully devoted several hours, and held several meetings, and carefully studied the merits of the plans sent in, irrespective of architectural effect or external appearance, have placed the plan of Mr. Sanders first as being the best-arranged plan, it savours somewhat of presumption and bias for an anonymous correspondent to question their decision, particularly as we are debarred from judging of his bona fides owing to the nom de plume assumed. I join issue with him as to the plan of the competitor he refers to "being the best arranged," even though he has had "all the advantages of constant intercourse and communication with the authorities" (and more) enumerated by "Looker-on."

I also have spent several hours in carefully studying the plans, and noting the merits and demerits of each, but purposely refrained from criticism until the competition was ended.

Only two of the competitors are personally known to me, Mr. Sheppard and Mr. Hine, the others by repute, therefore the remarks I have made have been perfectly unbiassed, and my motive has been to prevent "jobbery." I am one of those who favour the appointment of a professional adviser, of rigidly enforcing "the instructions" issued, and of avoiding all deceptions, failing which, I trust the day will not be far off when every respectable architect will decline to spend time, knowledge, and money in a thankless service, and cease for ever to be dupes and actors in the great farce of "Competition versus Fair Play."—I am, &c.,

R. W. G. Hayward.

6, Bar-gate, Newark-on-Trent, Sept. 30th.

DANGEROUS STRUCTURES IN THE HAYMARKET.

Sir,—This case is now ended—in the only way which was possible from the first—in an order for the dangerous structures to be taken down.

It is not for me to comment on the evidence given by other architects and surveyors as to what constitutes an *element of danger* in a structure, though I certainly heard some singular opinions on construction during the trial; but I can, without hesitation, assert that *not one* of the witnesses on the other side would have taken the responsibility of giving a certificate that the structures were safe *without the shores*.

An unfair attempt was made to try and prove that I had an animus in the case. My reply is that I suggested to the parties they should secure the structures under an award, and I held the dangerous structure notice over *for three weeks* on my own responsibility, and it was not till Mr. Sewell, Mr. Fagg's architect, wrote me a threatening letter requesting me to get the adjoining builders to shore up his client's house, and till I heard that Mr. Stevenson's *singular award* said that an *overhanging party-wall without* foundations or footings, resting on sand, could be raised on, that I took any steps in the matter.

I may add that Mr. Fagg walked into my office just before the first day of trial, check-book in hand, and wished to know how much I wanted to help him in the case.—I am, &c.,

ROBERT WALKER.

HORSESHOE ON CROSS.

SIR,—I beg to inform "H. P. H." that he is utterly wrong in supposing the horseshoe on the cross of my church to be an Omega; and, further, if he could look on the other side of the same cross he would find not an Alpha, but another horseshoe. If he is not ashamed of his name (he gives only initials), and will forward it, with his address, to me, I will send him a photograph of the cross in question, which I hope to get taken next week.—I am, &c.,

ALFRED EARLE.

Fovant Rectory, Salisbury, Oct. 2.

THE UNIVERSAL COFFEE AND COCOA PUBLIC-HOUSES ASSOCIATION (LIMITED).

SIR,—A prospectus of the "Universal Coffee and Cocoa Public-Houses Association (Limited)," offices, 1, Queen Victoria-street, E.C., has been circulated with my name in it as architectural surveyor to the association. I shall feel obliged if you will allow me to state that I have never had the slightest connection with this company, and that the use of my name by the promoters is most unwarranted.—I am, &c.,

MARK H. JUDGE.

6, Dudley-place, W., Oct. 1st.

THE NEW MARKET AT SOUTHPORT.

SIR,—I note in your description of the new market at Southport there is an error, which, if you will allow me to correct, I shall be obliged—viz., the late John Dence (not Ducie, as printed) died Aug. 5th, 1878, and had consequently nothing to do with the *present* market. The engineering work was designed by me for the executors of the late John Dence, Esq., and should have been reported as such.—I am, &c.,

JAMES TURNER.

Corn Exchange Chambers, London, Sept. 26.

HAWTON CHURCH, NOTTS.

SIR,—Will you allow me, through the medium of your columns, to call the attention of architectural students who are making, or about to make, sketching tours, to the existence of a most beautiful Easter sepulchre and tomb in the chancel of Hawton Church, Notts?

Hawton is two miles distant from Newark, which boasts of a magnificent church, and is alone worth taking a long journey to see.

Hawton church is undergoing restoration, under Mr. Fowler, of Lowth, but I am assured by the rector that the Easter sepulchre and adjacent tomb will remain untouched.

Feeling sure that all who take the trouble of visiting this relic of mediæval times must be filled with admiration of the skill and artistic feeling of the art-workers of that day, and contrast it with our own feeble imitations,—I am, &c.,

Sept. 30th.

ECCLESIOLOGIST.

A FAMILY PROFESSION.

SIR,—The recent throwing open of part of the space around St. Paul's Cathedral has brought out again into prominence the historical fact that the first stone of St. Paul's was laid on June 21st, 1675, without any public ceremony, by Sir Christopher Wren, assisted by his trusty master-mason, Mr. Strong. It has further been recorded that in 1710 Sir Christopher—then nearly 86 years of age—assisted by his son, laid the last stone; and upon that occasion was still attended by his faithful mason, Strong.

It is interesting to narrate that the Strong family have traditionally, without a single break, pursued the avocation of builders ever since. The present representative of his sturdy old ancestor is Mr. William F. Strong, now doing duty as clerk of the works at a church at Upper Tooting.—I am, &c.,

HARRY HEMS.

A SUBTERRANEAN LEVELLING STAFF.

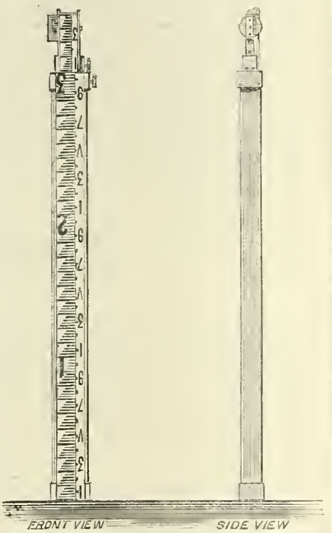
SIR,—IF you think that any notice or description of a new subterraneous levelling staff will be interesting to your readers, you can make use of the present communication. The levelling staff which I have designed for underground purposes consists of three lengths sliding into each other, and nearly resembles the ordinary Sopwith staff in that respect. The bottom length is graduated upwards in the ordinary way, and is three feet in length; but any other length could be adopted that might be thought more convenient. At the top of the first division of the levelling staff, a band is attached about two inches wide, which is graduated upwards and forms an accurate continuation of the scale on the lower division of the staff. The last-mentioned band passes over a brass roller attached to the top of the third or innermost division of the staff, and is from thence carried down and under a brass drum (on which it is wound) fixed just below the roller to the top of the same staff: the band being kept in tension by means of a box-spring attached on one side to the axis of the cylinder.

It will be seen from the above arrangement that when the second division of the staff is drawn out the band unwinds and gives a continuous reading up to five feet eight inches, *or for any intermediate distance that the height of the roof will allow*; the band being kept in tension at the required elevation, and lying flat against the face of the second division of the staff. In the same way when the third division is drawn out a continuous reading may be obtained up to eight feet, or for any intermediate distance, as before.

The second and third divisions of the staff are kept fixed in any required position by means of clamping screws, which are fixed in the sides, and the usual spring catches are also inserted in the back, which come into action when the divisions are drawn out to their full length. In the event of the staff being used in situations where from the height of the roof an occasional levelling at a greater altitude than eight feet can be obtained, it would be advisable to provide a light and portable support four feet in length with an iron shoe at the top to receive the bottom of the staff, and by which means the levellings could be extended up to twelve feet. The last-mentioned support could be made in the form of a box to hold the levelling staff, and would protect it from injury when not in use. The accompanying sketch will perhaps serve to convey some idea of the contrivance; the drawing being made to a scale of three inches to a foot. The whole weight of the staff only just exceeds five pounds, so that it is sufficiently light and portable, which is an important consideration in underground work. The levelling staff was made under the writer's directions by Messrs. John Davis and Son, of All Saints Works, Derby, and by whom the work was executed in an exceedingly neat and creditable manner.—I am, &c.,

GEORGE JOHN GEE,
Mining engineer, &c.

Pontypool.



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Mr. Saul, of Preston, the contractor for the new barracks at Preston, is fast bringing his work to completion. The buildings were begun in August, 1876, the contract being taken at £60,000, and at times as many as 240 men had been employed on the work. The site inclosed is about 9 acres in extent, and is a portion of the Bowerham estate, at the south end of Lancaster. The blocks of build-include quarters for 10 officers, 32 married men, and 120 single, exclusive of orderly staff; armoury, guard-house, canteen, hospital, stores, bath-rooms, and the usual offices.

Intercommunication.

QUESTIONS.

[5906.]—**White-Lead Paint.**—Will any of your correspondents kindly inform me of a cheap and easy way of analysing white-lead paint before and after it is mixed, and detecting any other substance mixed with it?—J. SPARROW, Napier, New Zealand.

[5907.]—**Damp in Houses.**—I note in the latest remarks of Dr. Richardson anent this subject, that moisture or condensed steam on the inside of windows of houses is held to be an infallible indication of damp in its worst form. Now, for eleven years my windows have streamed with moisture in autumn and spring, and thickly frosted with ice in winter, and yet neither self or family have ever suffered from the usual sequence of residential dampness, either from bronchitis or rheumatic fever, or lung disease, and though far from robust, we are as healthy as most people hereabouts. Still I cannot help feeling uneasy now that so eminent an authority has spoken. I should like to have an opinion or two from your correspondents before setting my house in order.—B.

[5908.]—**Emigration.**—I have served articles of apprenticeship in an architect's office, and I intend emigrating. Which country would be the best—America, Australia, or New Zealand? I may state that my age is 21, and that I am a fair draughtsman.—NOVA.

[5909.]—**Corrugated Iron Buildings.**—Would one of your correspondents who has experience in corrugated iron buildings kindly give a few hints respecting the distances apart of studs and horizontal timbers (4½in. by 3in.) of walls? Also distances apart of purlins laid on framed principals 9ft. or 10ft. apart; the building would be about 40ft. by 16ft. by 12ft. up to eaves.—IRON.

[5910.]—**Party-Wall.**—I wish to build a shop on the fore-court of house; adjoining property owner having a bay window in the front of his house objects to my shop wall as shutting out his light. I have been told that an angle (what degree?) taken from his cant window must clear the party-wall of shop. Can you inform me where party-wall must be kept so as not to obstruct?—H. F.

REPLIES.

[5897.]—**The Severn Bridge.**—A description of this structure, which is to be opened this day fortnight, will be found on another page.—ED. *B. N.*

[5900.]—**Drain.**—I have used square wooden trunks in long lengths, with holes bored in top and sides to allow water to drain into them under similar circumstances and found them answer well. I fear glazed pipes will continue to give trouble, but would advise that great care should be taken in making the under sides of the joints watertight, as probably the sand runs in with the water, and thus causes the settlement. Plenty of straw or moss well packed round the pipes will also prevent the sand from running away.—J. R.

[5900.]—**Drain.**—If "Enquirer" had prepared a good foundation for his pipes the mishap he speaks of would not have occurred. The soil being sandy and full of water has no doubt sunk from under the pipes, leaving them supported by the ends only, consequently the weight of the earth above has caused the pipes to break. I should recommend a plank foundation constructed of 2in. planks laid longitudinally the full width of the trench. The planks should break joint, and at the point where the joints are broken a transverse sleeper, 9in. by 3in., should be laid under the planking. No plank should be more than 4 or 5ft. in length. I have seen this plan carried out in similar soil, and at a greater depth, and it has answered well. Before laying the pipes the planks must be covered with good earth on which the pipes must be bedded, a hole being made for each socket to rest in, and the joints made with cement or asphalte.—H. T.

[5903.]—**Measuring Slating.**—"Port Madoc" is informed that the usual custom in northern counties is to allow 12in. extra to bottom courses of eaves, also to projecting gables, and 6in. each side of hips; no allowance for ridges. This is for the double courses at these places. No separate allowance for "cutting" to hips and valleys as in the south. The item given as 20ft. by 9ft. is evidently a misprint for 20ft. by 9in. I may add that there are many variations to this custom, some allowing as much as 12in. to each side of hips and 18in. each side of eaves. It is as well in quantities or measurements to state the data for guidance.—B.

[5905.]—**Blistered Painting.**—If "J. C." were to use alumina paint made by the Alumina Paint Company, Buckley, I think he would find it would not blister. Lead paints are very liable to blister, especially if laid on a surface which is not perfectly dry.—G.

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STAINED GLASS.

FRISBY-ON-THE-WREAKE.—The three-light window of the south transept in the parish church at Frisby has been filled with stained-glass by Messrs. Clayton and Bell. The design represents the Transfiguration. Mr. William Hill, plumber, of Leicester, undertook the insertion of the various parts at his own cost.

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WATER SUPPLY AND SANITARY MATTERS.

GOOLE LOCAL BOARD.—The Goole local board have instructed Mr. E. C. Buchanan Tudor, their engineer and surveyor, to prepare plans of a complete system of sewerage for New Goole and district. The Old Goole sewerage contract has been let to Mr. Marsh, of Thorne, who is to proceed with the works at once. Mr. Tudor strongly advised the board to carry out the main tank sewer 300 yards further, as the sewage would be tide-locked for many hours, and so that the storm-water may be more readily dealt with; but the board themselves considered an 18in. pipe sufficient, and ordered it to be laid down. The general opinion of other engineers is that the 18in. pipe will be a failure at a considerable cost to the ratepayers.

Harwich.—The works for the drainage of this borough are expected to be completed by Christmas time, and those in the Dovercourt main road are finished. The storage-sewer in Barrack-field will be 900ft., 7ft. high and 7ft. wide, having 250,000 gallons capacity, and, in case of spring tides or other checks to the discharge of sewage into the sea, nearly a week's sewage can be accumulated here. The sewage of the low-level district, which comprises the old town of Harwich and the Bathside next the Stour, will be forced into the storage sewer by means of a pair of engines supplied by Messrs. Hathorn, Davey and Co., of Leeds. The high-level sewer, serving Dovercourt, will run into the Barrack-field storage sewer by means of gravitation, and the whole will be discharged into the ebb tide through 18in. cast-iron pipes, which are to laid along the foreshore to a point 120ft. beyond the end of the stone breakwater. The contractor is Mr. John Hayward, of Eastbourne, and the expense is estimated at £10,000.

LEGAL INTELLIGENCE.

The Alleged Dangerous Structures in the Haymarket.—Magisterial Decision.—The summons against Mr. Fagg, the owner of No. 29, Haymarket, as to a party-wall and vault next No. 28, alleged to be dangerous (see report in last issue, page 38), came on again for hearing on Friday, before Mr. Mansfield at Marlborough-street Police-court. As before, Mr. Grain appeared on behalf of the Metropolitan Board of Works; Mr. Bingham for Mr. Fagg; Mr. Tatlock on behalf of the Civil Service Co-operative Society, the owners of No. 28, Haymarket; and Mr. Houghton for Messrs. Kirk and Randall, the contractors for No. 28. Mr. Sewell, surveyor, was recalled by Mr. Green, and said since the last hearing he had examined the south or main party-wall between 28 and 29, and could see none of the alleged new cracks, nor had the old cracks extended. One of the shores against the vault was quite unnecessary. Mr. William Harvey, architect, 6, Whitehall, said the south wall was not in dangerous condition; the absence of footings in so thick a wall was not material. The defects in the wall were caused by the improper removal of timber-work on the Stores' side. The shores put in No. 29, and also those in the vault, were certainly no advantage, and the latter at least did more harm than good. If No. 28 were restored as before, there would be no risk from the wall. Witness was severely cross-examined by Mr. Grain as to whether the absence of footings on a sandy soil was not an element of danger; he thought it was not. He thought the wall should be pulled down to a certain extent for the new building; the absence of footings and the bulging were certainly defects. As to the vault, the removal of the brick flue had rendered it necessary to erect shoring in the vault; if a party wall 18in. in thickness were erected the vault would stand. By itself and without shores the arch of vault would be dangerous. Shored up as it was, if the side wall next 29 were removed the arch would stand; the wall did not render sufficient support by itself. There were this afternoon vertical cracks in the wall both within and without. Re-examined: These cracks did not affect the stability of the wall. There was an engine at No. 28 which, if the wall were really dangerous, would bring it down. Mr. Thos. Hovenden had had twenty-five years' experience as a surveyor; had examined the south wall on both sides, and considered it was not in danger. It was of place bricks of fair quality, and any defects on No. 28 side were the result of building operations. If a proper party wall were erected next the vault, the shoring might be removed. Cross-examined by Mr. Green: The old flue on No. 28 can be removed by the contractors without danger, provided the shores are left in the vault. Mr. Worthington, a surveyor for thirty years, and Mr. Goodchild, architect, having twenty-five years' experience, corroborated. Both attributed the irregular appearance of the face of south wall to the manner in which the old joists were removed by the contractors for the Stores. Mr. Henry Smith, surveyor, corroborated, and, in reply to Mr. Mansfield, attributed the bulging of wall to age and slight settlement of foundations. Mr. D. T. Child gave similar testimony. Mr. Sheppard, builder, had pulled down many such walls, and did not believe the wall would fall if the shoring were removed. The evidence for the defence being completed, Mr. Mansfield said he should give his decision next day. At the rehearing, on Saturday, Mr. Mansfield said, in doing so, he must go back to the previous case with reference to this building. At the hearing of the summons, Mr. Walker, a gentleman for whom he entertained a very high respect, certainly showed a good deal of excitement, which to those not knowing him well, might not have been understood to arise from a desire to do his duty, and it might have been supposed that Mr. Walker, as a district surveyor, thought all walls dangerous till proved otherwise, as mad-doctors were said to consider everybody as mad. On that occasion Mr. Sewell's evidence was so strong that he hesitated to condemn the wall. It was made clear to him on that occasion that there was no immediate danger to the public, and the existence of the wall to the present day, notwithstanding the occurrence of a thunderstorm, had shown that this was well grounded, and there must have been some exaggeration on the part of the witnesses. He most conscientiously went through the evidence adduced, and upon that he was bound to rest his decision. The matter had, however, come before him again, and a number of witnesses of high reputation had given evidence directly contrary to each other. Notwithstanding this, however, there was no reason for impugning either their veracity or their judgment. There was no dispute as to facts; it was entirely a matter of opinion as to whether the wall and arch were or were not dangerous and likely to fall. Supposing that Mr. Walker's professional zeal had caused him to take an exaggerated view of matters, it would have had no effect upon Messrs. Woodthorpe and Hayward, both surveyors of long experience, who gave similar testimony. As no proof was possible, he could come to no other decision than to take the safe course of making the order prayed for. On Mr. Walker's suggestion, it was made an order for pulling down within ten days. Mr. Green, for Mr. Fagg, asked that the terms of the 73rd section of the Act of 1855, which ran:—"It shall be lawful for such justice to order the owner, or in his default the occupier, of any such structure to take down, repair, or otherwise secure to the satisfaction of the surveyor who made such survey or of such other surveyor as the said commissioners may appoint." He said Mr. Walker had exhibited an amount of zeal which had been commented on by the learned magistrate in his decision, and which he should almost characterise as unfair, and by giving the Metropolitan Board of Works the option of appointing another surveyor any unpleasant collision would be avoided. Mr. Mansfield said the proviso of this clause only referred to the possibility of the death or retirement of the district surveyor before the order could be executed, and as he had every confidence in Mr. Walker, he should simply make the usual order for 10 days. Mr. Fry, on behalf of the Board of Works, applied for costs; but Mr. Mansfield said he could not entertain it.

CHIPS.

The Mayor of Hanley is a sensible man. He has announced that, instead of following the custom of his predecessors of giving a dinner on the eve of leaving office, he should divide £100 between the School of Art and the science classes at the Mechanics' Institution. In these days of depressed home trade and foreign competition, he said, it was the duty of everyone to do what in him lay to improve the staple productions of the district by developing science and art in connection therewith.

The work of restoring the nave and chapter-room of Bangor Cathedral is being actively proceeded with, and the building in its entirety is expected to be opened early in the year. A curious recumbent figure, believed to mark the grave of an ancestor of the Penrhyn family, has been discovered under the chapter-room, and some old tiles were also found there.

The Concert-hall at Manchester was reopened on Monday after renovation and decoration. The benches in the hall have been replaced by chairs, new carpets and curtains are introduced, the walls coloured, and a fresh entrance made to gallery. Mr. Salomons was the architect, and the work has been carried out by Mr. Lamb.

The Lowestoft Improvement commissioners have received a report from Mr. Bruff, C.E., as to the works necessary to protect the beach sewer outlet, and have adopted the same. The estimated cost is £3,850.

George Ashcroft, builder, of Bishop's-road, Brixton, was fined on Friday, at Lambeth police-court, 10s. and costs for falsely representing himself to be a police-constable, at a common lodging-house in Mint-street, and threatening the inmates with a revolver.

The sinking of a new bore-hole 1,000ft. deep, which promised to raise nearly a million and a half gallons of water per diem, for the uso of the inhabitants of Liverpool, has proved a comparative failure, the net gain upon testing being an increased supply of less than 300,000 gallons a day.

The new Catholic Church of St. Mary Major, Carrick-on-Shannon, has been completed, and will be consecrated on Sunday, the 19th inst.

Our Office Table.

The *Irish Times* has recently been urging upon the Corporation of Dublin the necessity for obtaining a Building Act for the city. Three Dublin architects Mr. William Stirling, M.R. Inst. Architects, Ireland, Mr. Doolin, and Mr. T. N. Deane, F.R.I.B.A.—have taken part in the correspondence the suggestion has occasioned, and strongly support the proposal as a pressing necessity. Mr. Deane writes: "I have had no small experience in the erection of large works in Dublin, and when I look back to the troubles and difficulties I have had to encounter with neighbouring property—light, air, party-walls, foundations, ricketty neighbours, and a thousand other questions—I am only astonished that people venture to build. To avoid litigation, as matters stand, the cheapest way to go to work would be to buy the houses on either side of the one proposed to be rebuilt, and to sell them afterwards. When the city engineer discovers a dangerous structure, his powers are limited, his hands tied, and his action, when it is taken, is sometimes of the most contradictory nature."

Col. Rich has reported to the Board of Trade on the circumstances attending the breaking of the steps of a wooden footbridge known as the Militia Bridge, between Hounslow and Isleworth stations, on the London and South-Western Railway, on the 20th August, by which nine market-garden women were injured. He says that the accident was caused by the rotten state of the timbers, which any one who understood carpenter's work could have seen. In recommending that stone or iron staircases be substituted for wood in this footbridge, he suggests to the company that it is desirable to employ persons of higher qualifications in the inspection and supervision of the works of the railway under their district engineers than men who had originally been platelayers. Such men, although they may be excellent and trustworthy, cannot have the knowledge necessary to examine works of the kind which caused the accident.

The *Handelszeitung* states that the Austrian State engineers have completed the plans and specifications of the proposed Arlberg Railway in the shape in which they will be laid before the Reichstag. The scheme adopted is a modification of the original project elaborated in 1872. The mountain will be pierced at a height of 5,281ft. above the level of the sea, and by driving the tunnel in a straighter direction than was at first intended the length of it will be reduced to 10,270 metres. It is not yet decided whether or not private capitalists will be invited to participate in the undertaking; but the Minister of Commerce is said to be strongly in favour of making it a purely State railway.

Mr. Paul Falconer Poole, R.A., who died on Monday week at Hampstead in his 74th year, was a native of Bristol, and was born in the year 1806. He was to a very large extent self-taught, and first made his mark by his treatment of Welsh subjects, in which the life of fishermen and peasants was ably delineated. He did not, however, attract any very great attention on the walls of the Royal Academy or elsewhere until the year 1843, when his picture of "Solomon Eagle calling the people of London to repentance during the Great Plague" brought his name into prominence. This was followed by others such as "The Beleagured City," "The Suppression of the Monastery of Sion-house," "The Goths in Italy," "The Messengers announcing to Job the slaughter of his Servants," and "The Song of the Troubadour, Bertrand de Born," which were produced in various years between that date and 1854. To the Royal Academy Exhibition he contributed in 1840 "Herman and Dorothea," and in the following year "The Children of Israel weeping by the Waters of Babylon." In 1842 he exhibited two pictures, "Margaret at the Spinningwheel" and "The Tired Pilgrims." He was elected to the minor honours of the Royal Academy in 1846. Subsequently to that date he produced "Arlète discovered by Duc Robert le Diable" (1848); "The Blackberry Gatherers" and "Scenes from the *Tempest* of Shakespeare" (1849); "The May Queen" and "Mariana Singing" (1852); "The Conspirators in Midnight Meeting," from Boccacio's "Decameron," in 1856; "Leading the Blind," "The Dragon's Cavern," and "Autumn," have been among Mr. Poole's more recent contributions to the Royal Academy Exhibition. He was promoted to the full rank of a Royal Academician in 1861.

Communications have reached us (says the *Lancet*), and observations have been made, which compel us to draw very serious attention to the condition of some of the cemeteries within the metropolitan district, which are rapidly becoming sources of peril not only to the neighbourhoods in which they are situated, but to the whole metropolis. The emanations from some of the newly-opened graves is so horribly offensive as to occasion nausea among those who attend at funerals. As cases of actual illness after being present at interments in some of the cemeteries have occurred, there can be no doubt about the danger. Meanwhile the crowding of the graves is apparent. The number of bodies laid in the earth may not be excessive when calculated upon the whole acreage of the space licensed, but with an eye to the future the ground seems to be appropriated in parcels, while in some of the older cemeteries there is really no room for more graves, and the license ought to be withdrawn. The intervention of the Secretary of State should not be delayed.

The results of the examinations conducted by the Sanitary Institute of Great Britain having shown the necessity for some systematic plan of technical instruction in sanitary science, the council have decided to establish a school of hygiene in London to be opened during the month of November next. The course of instruction will include the following subjects:—Preventive medicine; practical sanitary science—(*a*) medical and chemical; (*b*) engineering and constructive; jurisprudence and sanitary law. The following gentlemen have been appointed the first lecturers:—Preventive medicine—Dr. B. W. Richardson, F.R.S.; practical sanitary science—(*a*) medical and chemical—Prof. Corfield; (*b*) engineering and construction—Captain Douglas Galton, R.E., C.B., F.R.S.; jurisprudence and sanitary law—W. H. Michael, Esq., Q.C., F.C.S. It is proposed that each session should occupy about twelve lectures, and the course will embrace the subjects included in the examinations of the Sanitary Institute of Great Britain and other examining bodies. Applications for tickets for the lectures to be made to the secretary, 20, Spring-gardens. The school will be open to all classes, and to persons of either sex. The fees and classes will be so arranged that students can be entered for a whole or a portion of each course.

The election of a pensioner on the funds of the Builders' Clerks' Benevolent Institution took place at the offices, 27, Farringdon-street, E.C., on Tuesday evening last, Sept. 30th; Mr. Thomas F. Rider, President, in the chair, supported by Messrs. T. Stirling, W. Hewitt, E. Graystone, E. Brooks, J. Robson, &c. There were two candidates—viz., Mr. J. S. Fairley and Mrs. S. A. Coulson, the polling resulting in favour of the former, who was declared duly elected. Votes of thanks were passed in favour of the scrutineers, Messrs. T. Stirling and B. C. Fox, who briefly responded; and to Mr. Rider, acknowledging the important services he had rendered to the institution, and for his kindness in presiding that evening.

Complications of a serious character have arisen between the contractor and the clerics in connection with the erection of the tower and spire of St. John's Roman Catholic Cathedral at Limerick within the past fortnight. The clerk of works rejected the stones supplied by the contractor, Mr. Kenna, as being unsuitable. Mr. Kenna declined to supply others, and stopped the works, alleging that the stones were the best that could be obtained. Professional testimony of a conflicting nature has been given on both sides. Meetings of the trades have been held on the subject, at which resolutions were passed declaring that Mr. Kenna had been unjustly treated, severe comments were made respecting the action of those who rejected the stones, and it was resolved that no men belonging to the guilds should engage in the erection of the tower so long as the dispute with the contractor lasted. On Monday morning, at 5 a.m., the Rev. Father M'Coy, who was accompanied by several stone-cutters, presented himself at the works and demanded admission, which was refused. The representative of the Church Militant passed through the cathedral, and effected an entrance to the inclosure of the tower. No resistance was offered by the contractor's men, owing to the presence of a large body of police, but angry words were exchanged. Kenna's men then left, and during this week Father M'Coy's men have been at work under the protection of thirty policemen.

Mr. Edwin Edwards, a singularly versatile and earnest follower of the higher arts, died on the 15th ult. in his 57th year. He was born at Framlingham, Suffolk, and was educated for the law. He published several works on legal practice, and was a highly cultivated musician, but will best be remembered as a landscape-painter and etcher, his sketches of Cornish coast and East Anglian scenery being well known at London exhibitions. He leaves incomplete "Outs for Inns," a volume unique in conception and execution, describing the journey from London to Yarmouth, viâ Ipswich and Lowestoft, and profusely illustrated with etchings, which will hereafter be invaluable to archæologists, and also an illustrated life of "Old Crome." Mr. Edwards was a genial artist, ready to impart information to any inquirer, a gentleman in every sense of the word, and loved by his fellow-artists, whether of the brush or the needle. He was President of the Hogarth Club, not an infrequent exhibitor at the Royal Academy, but the exhibition which will be the weaker for his too early death is that known as the Black and White at the Dudley Gallery.

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Lamplough's Pyretic Saline is Refreshing, most agreeable, and the preventive of Fevers, Biliousness, smallpox, skin diseases, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[Advt.]

Holloway's Pills will render delicate invalids the most essential service when they suffer from bilious affections, loss of appetite or indigestion through damp, cold, or variable weather. Lowness of spirits, sick headache, dimness of sight, faintness and vertigo, resign their perplexing sway after a few doses of this regulating medicine.—[Advt].

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CHIPS.

The new chancel added to the Church of St. Michael and All Angels, Bishopston, was consecrated on Michaelmas Day. The cost of the additions has been £2,150. Mr. F. Preedy, of London, was the architect; and Messrs. Wickens and Hill, of Bristol, the builders.

The Hastings Board of Guardians considered on Thursday, the 25th ult., amended plans for a new workhouse, prepared by Mr. Elworthy, their architect. They provide accommodation, exclusive of infirmary and central wards, for 316 persons, and are estimated to cost £6,500.

New Board schools in Trafalgar-road, Horsham, have just been completed. Messrs. Peters and Co. were the contractors, and Mr. Harding was the clerk of works.

Representations have been made to Earl Beaconsfield to place Mr. John O'Hart, of Ringsend, Dublin, on the civil pension list, in consideration of his labours in the field or Irish archæology, especially in tracing out the genealogies of Irish families.

Turvey-bridge, Bedfordshire, has just been rebuilt by Mr. C. H. Warren, contractor, of that village, in accordance with plans prepared by the county surveyor.

The restoration of Toddington Church was commenced on Monday week by the contractor, Mr. Marshall, of Houghton Regis. The south aisle of nave will be rebuilt; the windows in this portion of building fitted with new transoms and re-glazed, the chancel roof releaded, and other necessary works carried out.

The members of the Bedfordshire Architectural and Archæological Society recently made an excursion to the neighbourhood of Wellingborough. The proceedings commenced by an exploration of the Roman camp at Irchester, under the guidance of the Rev. R. S. Baker, who has superintended the excavations made on the site during the past few years. After seeing St. Catherine's Church, Irchester, with its fine tower and spire, its Early font, and the chancel, which has been raised above the level testified to by the piscina and sedilia, the members went to the more beautiful church of Rushden. The steeple and crocketed spire, in all 192ft. high, are the finest in the district; but the peculiar feature of the church is a stone arch acting as a double buttress within the nave walls, which is richly pierced with tracery. At Higham Ferrars the fine church dedicated to the Virgin Mary was visited; the crocketed spire, the carvings in relief on the tympanum of west doors, the monumental brasses, misereres, and tiles on chancel floor receiving attentive notice. Chichele's bedehouse, the remains of the college, and the site of the castle having been seen, the day closed with visits to Irthlingborough Church, which has a detached campanile, over which is an octagonal tower; and to Finedon Church, a most perfect specimen of the Late Decorated style.

Sadler's Wells Theatre is to be reopened on the 9th inst., having been reconstructed from the plans of Mr. C. J. Phipps, F.S.A. The house will now seat 2,500 persons, of whom 1,000 can be seated in the pit, 800 in gallery, and 400 in the family circle. A covered carriageway opens into a crush-room, in which is provided a large fireplace. To each division of the house are broad double entrances and exits, spacious saloons, and cloak-rooms. The stage is lofty, and very deep.

The prizes and certificates awarded to students in the Science and Art School attached to the Mechanics' Institute, Bradford, were distributed on Friday by Lord Frederick Cavendish, M.P.

The negotiations between the Glossop Corporation and Lord Howard of Glossop, for the transfer of the waterworks from the latter to the former, have been brought to a satisfactory conclusion. The sum agreed upon is £2,200.

The *Daily Chronicle* states that in the original plans of the huge block of offices constituting the eastern portion of the new Law Courts, provision for a refreshment buffet was somehow overlooked. This omission is being rectified by the conversion of certain coal vaults into what may perhaps prove tolerably commodious, but rather dark, kitchen, refreshment-bar, and dining-rooms. The walls of these vaults have been plastered over, and the apartments thus reclaimed are being fitted up and decorated, and will be ready for use in a few days.

A warrant has been granted by the Swansea magistrates for the apprehension of William Griffiths, secretary of the Cambrian Building Society, on a charge of embezzling the sum of £750. Griffiths is also secretary of two other building societies—the Working Men's and the Abertawe.

A new Roman Catholic church was consecrated at North Berwick on Wednesday week.

The Sittingbourne Local Board, on Wednesday week, affixed the common seal to the purchase of 10 acres of land within easy access of the town, at a cost of £2,200, as a site for a public recreation ground.

In connection with the restoration of Tewkesbury Abbey, it should have been stated that the tiles were supplied by Mr. Godwin, of Lugwardine Works, Withington.

The Wesleyans are about to erect a new place of worship at Chelmondiston. Mr. William Eade, of Ipswich, is the architect. The chapel will be about 40ft. in length by 27½ft. wide. The contract has been undertaken by Mr. William Wagstaff, of Freston, for £890.

The memorial stones of a new Wesleyan chapel and school were laid at Burslem on Tuesday week. The buildings will consist of a chapel, 40ft. by 31ft. 6in., with entrance porch and vestry, and school, 12ft. by 21ft., with two class-rooms at the rear of the chapel. Accommodation will be provided in the chapel for 200 and in the school and class-rooms for 450. The materials used in the walls will be brick. The elevation will be faced with pressed bricks, relieved with stone dressings and terra-cotta work. The work is being carried out from the designs and under the supervision of Mr. Ralph Dain, architect, of Burslem and Hanley, by Mr. John Grosvenor, builder, of Tunstall, whose contract is £900, exclusive of heating and lighting.

Some interesting remains of the Roman baths were found last week during building operations at Bristol, and have been deposited in the literary institute in that city. They consisted of two fragments of panelling, sculptured in oolite, and bearing on their faces, the one parts of figures, and the other continuous foliated designs. Portions of cornice, bases, and capitals of two columns of different dimensions have also been found.

The Northern Railway in the Isle of Man was opened for passenger traffic on Tuesday week.

At St. Michael's church, Gloucester, the tower is being repaired, the floor beneath is being paved with Minton's tiles, and a new font-cover provided. Messrs. Waller and Son, of Gloucester, are the architects. The four-light west window as a part of the same memorial scheme is being filled with stained glass. The lights are occupied with figures and groups in two tiers, emblematic of the cardinal virtues, Faith, Hope, Charity, and Love. The window is the work of Messrs. Clayton and Bell.

The 255th anniversary of the Baptist meeting-house at Kilmington, Somersetshire, was celebrated on the 14th ult by reopening, after renovation and the addition of a schoolroom. The work has been carried out by Mr. Perryman, of Axminster, and Mr. Adams, of Kilmington.

The local board of Maesteg decided on Monday to erect a town hall at a cost not to exceed £4,500, from the plans and designs of Mr. Morris.

THE BUILDING NEWS

LONDON, FRIDAY, OCTOBER 10, 1879.

IPSWICH CORN EXCHANGE COMPETITION.

FIFTEEN designs are now on view at the Town Hall, Ipswich, for the Exchange, offices and shops which the Corporation propose to erect in the rear of the first-named building. The site purchased is surrounded by three streets, King-street, Little King-street, and Lion-street, and it is intended to utilise the frontages by shops with rooms above them, the central area being devoted to the Exchange, and the basement to cellarage. It is proposed that additional municipal offices should be obtained in connection with those in the Town Hall on the second floor in King-street. The number and size of the shops were left to the competitors, who also were free to adopt any style they chose. The designs exhibit a general similarity in the plan, and it is evident there was little scope for variety in the arrangement and dimensions. In the conditions it was suggested that the new corn exchange should occupy an area of half as much again as the present building, which is 5,454 sq. ft., and some of the authors have, to secure the largest area possible, cramped the shops in depth. Examining the designs in the order in which they are hung, we recognise the hands of several former competitors for the Post-office and Museum. "Lux," the elevations of which remind us of those of "Suivez Moi," selects a Classic treatment to harmonise with the town-hall, and we may observe that all the designs are based more or less on this style. The elevation of "Lux" has at least one merit of not misrepresenting itself. In many of the designs we might mistake the intention for hotels and warehouses, or blocks of shops, but in this the Little King-street elevation is of two stories with a well emphasised entrance. We cannot speak so favourably of the King-street façade of three stories; the corbelled oriel above the arched entrance and the broken pediment look heavy and coarse, and the detail has the same fault. Ancaster stone is proposed for this front, and white brick and stone for the other sides. The corn exchange is placed close up to the town-hall passage, and is divided longitudinally into a wide and two side avenues or aisles by cast-iron columns and arches. Its dimensions are 115ft. by 68ft., the superficial area being 8,280ft. The main roof is constructed of elliptical wrought-iron ribs, which spring from a clerestory, and the lighting is chiefly obtained from the latter and a lantern light, which runs along the centre of main roof, the side portions between ribs being panelled. Eleven shops are provided on the three main frontages—four on the King-street front, six on Little King-street side, and one at the return corner. On the first-floor plan we observe the side avenues of exchange are roofed over, and have top-lights over each bay. Above the shops are offices. The second-floor is devoted to municipal offices on the King-street front. There is a wide arched entrance to exchange, with ornamental ironwork in the head in King-street, ticket-takers' boxes being on each side; another similar entrance is shown in Lower King-street, in the centre, and a third in Lion-street. The advantage of the last-named may be questioned, as there is no thoroughfare on that side. An alternative plan shows the exchange without lavatory and shop at Lion-street end, making its dimensions 137ft. by 68ft. with a central nave of 38ft. The general arrangement of the exchange is suitable, and the drawings are well prepared. Estimate £17,000. A rather remarkable plan bears the motto "Oval." The author (Mr. Cheston, we believe) has adopted that figure for the plan of his corn exchange, the three main frontages being divided into shops, as in the majority of cases. The oval, or rather elliptical-shaped exchange is lighted from the roof entirely, and has an area of 8,500ft., being 101ft. by 61ft. Its entrances do not coincide with the axes of the ellipse. This is unfortunate; three are shown; the two side entrances are in good positions. Four shops are obtained in King-street, six in Little King-street, and four in Lion-street—14 in all. The style selected has decided Queen Anne features; the tower in King-street is very attenuated, and the composition has a semi-Gothic effect that would not very well agree with the Classic surroundings. The chief defect in the King-street elevation is the flat elliptical arches over the shops, which look particularly weak at the angles. The author shows three stories. On the first-floor is a reading-room in connection with the exchange; there are offices over shops towards King-street, and sitting and bedrooms over shops along the side street. Nine offices are provided; on the second-floor are a surveyor's, drawing, medical, and town clerk's and inspector's offices, connected with the town hall by a corridor over the town-hall passage. The estimate is £21,000. "North Light" (by the author of "Bona Fides" and "Postage Stamp") is a well-considered arrangement in the Italian style, though the author has failed to express externally the character of the building. The King-street elevation is flanked at ends by high pavilion roofs, and the detail to the windows is of a stereotyped order. More striking in its grouping is the side facing Little King-street, in which the author, by breaking back to the exchange the upper stories above the shops on each side of main entrance, obtains a bolder front, besides side windows to his exchange. The exchange is rectangular, 131ft. by 60ft., disposed centrally with desirably-placed entrances in the centre of both sides, besides the main one in King-street. There are two shops towards the latter; in Little King-street there are two shops on one side and one large shop on the other side of entrance. Offices are shown close to the latter; but the author has not obtained his shops and offices upon the most economical plan, the upper offices are unnecessary, and more rooms are shown than required. The main feature of the design is the mode of lighting: the author, as indicated by his motto, obtains a north light by glazing the north slope of his roof, which is constructed of circular wood ribs springing from the walls filled in with ornamental ironwork spandrels. Rendle's glazing is specified. Side lights are got above the shops in Little King-street by the breaking back of the upper stories and three windows at the west end. We observe no gallery. The author estimates his design at £17,848, a figure much too low. The cubing of the exchange is taken at 4d. and that of the shops at 8d., but these prices inadequately represent the somewhat extravagant features of the design. White Suffolk bricks are specified for the Little King-street front, and Bath stone with Portland stone for the main front. Internally the exchange is proposed to be in white brick relieved by red bands. We believe this design is favourably regarded by some of the committee. A bold ink perspective accompanies this set. In "Side and Top Light" (by the winner of the Post-Office) the corn exchange follows the irregular boundary of site on the Lion-street side, an arcade of iron pillars dividing this part of area from the main portion. The dimensions are 121ft. by 69ft. It is lighted by side and end lights in addition to the glass roof. The latter is shown with wrought-iron ribs of elliptical shape, which spring from iron pillars with foliated capitals on one side, and the spandrels of ribs are filled in with cast-iron scrollwork. The interior pencil view does not impress us by its architectural merit. The elevation, also sketched freely in pencil, is in a species of Classic Italian, and represents a three-storied building towards King-street, the centre being carried up as a tower with high roof. The detail is overdone, but broadly treated, and the author has endeavoured to make his design harmonise with the town-hall, though we do not think he has altogether succeeded. The return elevation of the front and the pointed roof are not prepossessing features. There are single-story shops facing Little King-street, and fifteen shops of good size are obtained altogether, seven facing the latter and four at each end. We observe the level of exchange is nine steps above the ground-level: this is undesirable. An alternative plan shows the exchange raised above the shops, and a total width of 87ft. 6in. is obtained, with two aisles and shops below. Offices are shown in front, level with ground-floor of town-hall, with tram rails and lifts in basement. The estimate is £16,183, the cubing being at 9d., 7d., and 6d. for the several parts. In "Ceres" No. 1, we believe the design of a local architect, we have a flat-roofed Classic-treated block, the chief features of which are rusticated piers between the windows. The elevations of three stories are scarcely characteristic, and we might mistake the building for that of a warehouse. The exchange, 115ft. by 58ft. 6in., top and north lighted, is well planned as regards the entrances, but the shops are certainly too large and few on the main sides to make them remunerative; thus there are only two in King-street and two in Little King-street; the latter are 31ft. by 15ft. 6in., and would have been better sub-divided into four; nor was it necessary to have more than two stories in Little King-street. One of the best features is the side galleries of exchange, obtained over the irregular portion of the area and over the entrance, but the manner the arches spring from the coupled columns is unsatisfactory. The estimate is £18,000, and stone is proposed for the fronts.

"Civis" is a design marked by more character than many others. It, perhaps, smacks of the railway-station in the treatment, and is a little ambitious and heavy in detail, but the exchange is pronounced externally—a point that has been lost sight of by many other competitors. The design in Classic Italian is flanked by domical roofed wings at the angles, between which the semicircular end of exchange roof is visible, though the front offices, of which there are three stories, would practically hide this feature in so narrow a thoroughfare as King-street. The exchange is 119ft. by 65ft., and has an annexe and lavatory on the irregular side of site, the chief part being roofed, with semicircular ribs of iron and glass, resting on one side upon piers of brick. Side windows are also obtained between the corner tower-like blocks on the flank side above the roof of shops, which are kept one-story. The shops are of sufficient number and size for letting, and the staircases are better managed than in many other instances; the author also obtains a side entrance in Lion-street, a very necessary position for one. We do not observe any provision to prevent glare from the roof. The drawings and perspective in ink are rather roughly finished. The estimate is £17,000. "Ceres," No. 3, is another expressive design in Classic. The octagon tower and cupola at the angle suggests the Farringdon-street Markets, and the whole is freely treated. There are two orders — one an arcade including a mezzanine over the shops, and an upper story with pediment in centre. The plan shows a corn exchange 118ft. by 66ft., with two rows of iron pillars, the central area having arched ribs. There are three semicircular alcoves or apses, one at each end, and one in the centre of longest side, forming entrance-lobbies. The roof is semicircular, and the light is obtained from that source chiefly. The shops on three sides are too few and large to answer. The estimate (£14,000) is much below the mark for the style adopted. "Non quo, sed quo modo," shown by a clever ink elevation, is one of the few designs which distinguish the work of an artist. It is French Renaissance, and has a chateau-like appearance, with steep roof at corner, not very characteristic of the purpose, but well grouped and good in detail. The exchange occupies a smaller area than most of the plans; it has a circular end, and is 92ft. by 59ft., with a passage aisle round and stalls. There is a row of private rooms behind the stalls on one side, the use of which is doubtful, and the shops are too small. The entrances are good, and the exchange is lighted from a semicircular roof of iron, with some clever detail in the spandrels of arcade. The shops are on the two principal sides, and a farmers' club-room, news-room, &c., are proposed on the Lion-street end. The shops are arched below, and the upper stories include two orders; there are thus three stories in King-street. The estimate is £24,280.

"Ceres," No. 2, is also Renaissance, and is illustrated by a clever ink perspective, showing an elevation with square angle tower, severe in its Classic lines, but too monumental for an exchange. The lower story forms a rusticated basement. The cupolas which adjoin the tower and flank the elevations are apparently meaningless features, and there is certainly too monumental a character about the design for its intended use. The exchange is central, 115ft. by 55ft., and is surrounded by 13 shops—6 on the flank, and 4 facing King-street. The main entrance to exchange is at the corner marked by the tower at the angle of King and Little King-streets, besides three others. On the first-floor the offices are all round, and there is a reading gallery at the Lion-street end. The exchange is lighted by windows on three sides above the shops and by top lights; there is a gallery round it, and the design rather resembles an assembly-room than a corn exchange. The flat coved roof is suggestive of this. The chief defect of the design is that it competes with the town-hall, and we think a tower a costly and unnecessary appendage to a building of this class. The estimate is £13,000 in bricks, and £15,000 in stone. There are a few other designs that call for notice. "Economy," an Italian design, with centre carried up with cupola, and lantern, is spoilt by the huge terminals and coarse detail. The exchange, 125ft. by 56ft. 6in., has three entrances, and has shops on the principal sides. It is lighted from centre skylight only. Cost is £14,600. "Exchange" No. 1 is a laboured and pretentious mass of building in Renaissance, more like a huge hotel. It has an elaborate and heavily massed elevation with central tower and cupola that would vie with, and completely overpower, the town hall. The exchange interior, with gallery, would be well adapted for a town hall or concert-room; it is placed on the first floor, and covers an area of 118ft. by 86ft. It is lighted by side windows. The ground floor is entirely utilised by shops and vaults, with a dark centre passage; ware-rooms are placed below. The rental is estimated at £750, and the cost of building at £25,000. "Exchange," No. 2, Renaissance in style, is weakly-drawn, commonplace in elevation, in poor perspective, with a side tower. The exchange occupies the centre, it is 122ft. by 57ft. 6in., and is lighted through a semicircular roof with skylight at top, also above the shops. The shops are all round, and number 20, but some of these are useless for letting. "Civis non Peregrinus" has an exchange 123ft. by 68ft., lighted from a glass roof and skylights over side aisles. There is a mezzanine floor above shops, but the composition has nothing expressive about the elevation. "Economy," No. 2, is a meagrely drawn mechanical design, with Tuscan columns, round exchange, and certainly does not altogether justify its motto, while "Adolescentes" is a singular-looking group of building, smudged with dark purple and red, and is too bizarre and sensational for serious notice.

From our brief review of the designs it would be unsafe to express any decided opinion of the merits, but we think that in the designs under the mottoes "North Light," "Civis," "Ceres" No. 3, "Lux," and one or two others we have noticed the Corporation have a tolerably wide field for selection. We think, in making their decision, the committee should keep in view the points of accommodation, good lighting without glare, the position and size of the shops, good entrances to the exchange on each side besides that from King-street, and a suitable architectural treatment that will not appear to come into competition with the town-hall. Any feature like a tower or cupola, unless very moderately expressed, would be objectionable on this account. On the same ground we believe one story of rooms sufficient over the shops in Little King-street. The cost of many of the designs would exceed the sum the committee contemplated to spend upon the building—we believe about £17,000; on the other hand, they should bear in mind the capability of the plan as regards the question of letting, and the revenue that ought to be derived from this source, without injury to the exchange. Three stories of rooms, as some have proposed, along the side and end streets would be a useless expense, and we consider the best return would be derived from shops of moderate size, placed without obstructing or obscuring the principal function the building is designed to fulfil.

THE TURNERS' EXHIBITION.

THE Turners' Company have shown considerable enterprise and spirit in promoting the art which they were chartered to encourage and protect. Their yearly exhibitions have taken the lead among those of other guilds, and the exhibition of hand-turning now on view in the saloon of the Mansion House shows a steady improvement in the qualities of technical skill and design, mainly due, we think, to these competitive contests. The present exhibition is not large, but the exhibits are various, the objects including turning in wood, stone, iron, brass, steel, and gun-metal. Taking the wood classes first, we find there are 24 exhibits, which embrace almost every conceivable object to which wood-turning can be applied. In the award of the prizes by the judges (Mr. C. Hutton Gregory, C.M.G., Mr. C. Jacques, and Mr. Robson), the conditions considered essential were beauty of design, symmetry of shape, utility and fitness, and novelty; exact copying and hand-turning without special appliances were necessary. The first prize in this branch, consisting of the freedom, a silver medal, and a set of Holtzapffel's "Turning and Mechanical Manipulation," was awarded to Mr. J. G. Norris, of Cowper-street, City-road, for a pair of vases in ebony, inlaid with tulip-wood, and enriched with medallions and handles of the latter material. The vases are entirely lathe-produced, and as specimens of accurate turning and good workmanship are admirable. The outline of the vases is elegant, and there is not much to find fault with, except that the bases would have been better in the ebony. The inlays consist of narrow bands of tulip-wood and ivory. The second prize (bronze medal) is awarded to Edward Hellens, of Kingsland-road, for a pair of ebony vases relieved by ivory in rings. The ebony is beautifully polished, and may almost be mistaken for glazed pottery. The body of the vases is rather long for the base. The smoking-stands by A. Foster, awarded the third prize, are clever pieces of turning. We notice several other specimens of excellent work exhibiting manipulative skill at the lathe, but of the design of which we cannot speak so well. A pair of turned pine vases, and a vase of light or reddish wood with ebony base relieved by white flowers in ivory, and a pair of inlaid candlesticks, are specially worth notice. The latter are designed with some taste, and the colours of the inlaid brown and reddish woods are harmonious. We also notice some toilet glass standards, in soft white wood, cleanly turned, and some specimens of turning applied to a hexagon, a square, and triangle. A sugar-basin and vase, of a species of Tunbridge ware, made of small cubical pieces of dark-coloured and light woods glued together, and afterwards finished in the lathe, are particularly interesting exhibits, displaying much taste, ingenuity, and skill. Many of the winners of prizes in wood are provincial turners; and Thirsk, Hastings, Cardiff, and Coventry are represented. In the stone class of hand-turning, Mr. D. Penny, a builder's workman, Old-street, E.C., wins the first prize of the Company for a monumental head in Portland stone, the design of which, and the ornament, are entirely produced by the lathe. It is a circular disc or head, cusped round the outside, and relieved in the centre by circular sunk panels in the form of a quatrefoil; every circular sinking or raised ornament is moulded on the edge; the lower portion or base of the stone forms an elongated panel, the edges of which are also moulded, and the workmanship is remarkably clean and sharp in the moulded edges. The design has the merit of novelty at least. Mr. W. Pearce, of Grosvernor-street, takes the second prize for a vase, chalice, &c. The vase is of Mexican onyx, and is of simple swelling outline, relieved by a few plain sinkings and base mouldings, without destroying the plain surface of the material. The chalice is simple in form, and the design plain but suitable. Two circular boxes, one of Mexican onyx, beautifully marked in the lid, and the other of Devonshire spar, are admirable specimens of turning in this material, and the artist has judiciously avoided cutting up by mouldings or members the plain and highly-polished surface, so that the beauty of the texture and variegation of the material is not lost. The fluor spar tazza and drinking cups and saucers, by W. Caulman, of Torquay, exhibit some exquisitely clean and fine turning, though the artistic motive of turning in spar such utensils can only be considered from a purely mechanical point of view. Mr. Boden, of Derby, also wins a prize for some good work. The onyx shells and flowers by V. Abertoldi, of City-road, awarded a special prize, are exceedingly interesting examples of manipulation exquisitely finished. In this department the judges were Mr. W. Brindley, J. Jones, Mr. Simons, and Professor Tennant, F.G.S. Passing to the metal-turning, the first prize is won by F. P. Munro, of Dulwich, for a section of solid dandy-roller for paper making. The roller is made of gun-metal electro-plated, and, as an example of technical skill and clever turning, is unsurpassed. Mr. W. Heyes, of Wimbledon, gets a second prize for a beautifully finished balance and escapement for a ship's chronometer. Mr. Bayley, of Walsall, also obtains the third prize for a pair of polished brass candlesticks, entirely hand-turned, and of meritorious design. As specimens of lathe work, Jabez James's fluted shafts in bronze, and keys in case must be noted. The horological exhibits in this class are too numerous to mention; but we may allude to some very fine chronometer work, turning-in sapphires for jewel-hole, a model of escapement, another of a pumping engine by Jabez James, and a paddle shaft. In awarding the prizes in this department of the art, accuracy of turning and fitting, and good finish were indispensable conditions of success. On the whole, the exhibition is a decided improvement upon one or two of previous years we have seen. The principles of artistic turning, as applied to the various materials, appear to have been kept in view, and we see fewer of those extraordinary instances of misapplied talent and industry that we have before witnessed. Still there is room for vigilance and study in this respect, there are here and there, evidences of a desire to be more dexterous as a manipulator, than to work truthfully and moderately as an artist by considering the material and the purpose or utility of the object produced. We would impress upon the technical artists who compete for these prizes that the "skill in overcoming difficulties in regard to the material," one of the conditions laid down by the judges may be carried too far, and we merely instance some spiral candlesticks by H. Burbage, as an instance, admirable in all other respects as they are. Turning as a special mode of treatment should be controlled entirely by the nature of the material and its inherent ornamental beauty. It would be totally wrong to treat a soft wood baluster in the same way as a hard material, or some rich and variegated stone like onyx, alabaster, or spar. In the latter case the inherent beauty of the material ought to make the artist feel that every groove and member obliterates the natural interest of the material, and that simple outline should be a paramount consideration. The Turner's Guild includes in its list of freemen the names of several great workers, among them Sir W. Armstrong, Sir J. Brown, Mr. Gladstone, Sir J. Whitworth, Col. Grant, Professors Morris and Prestwick, Sir F. Leighton, &c., and at the meeting yesterday the freedom of the company was conferred upon Mr. Erasmus Wilson, F.R.S. The success of this and former exhibitions is largely due, we believe, to Mr. R. Loveland, barrister, and the secretary to the company.

THE PHOTOGRAPHIC EXHIBITION.

THE Exhibition of the Photographic Society of Great Britain, opened on Monday last at the Gallery, 5, Pall-mall East, is especially worth a visit for the variety of recent processes or modifications of photography. The wet and dry collodion, the gelatine, and other methods are represented, and from a scientific point of view the collection is particularly interesting. The sensitive dry-plate and carbon-printing is an important feature in the present exhibition. Instantaneous photography, together with the endeavour to insure permanence, have been the chief aims of the artist in this department; and in some of the pictures the old silver-printing has been superseded by the gelatine or carbon process. The subjects represented, too, are various; portraiture, landscape, and architecture are prominent, and the exhibition comprises works of many leading photographers, besides members of the Society. The value of photography as an art must ultimately depend upon the scientific perfection of its processes, and the adventitious aid rendered to it by touching up, though it may be productive of pleasing pictorial results, is not one that the photographer can regard with satisfaction. A retouched photograph as a mixed work of art is undesirable, and we believe it is the Society's aim to encourage dependence on the actual results of the art.

The School of Military Engineering, Chatham, send some excellent works; we particularly refer the reader to Nos. 1, 11, 15, 17, &c. Lledr Valley, North Wales, and the views of Tintern Abbey, especially the east and west windows (15 and 16), and the view of interior (17), are very fine examples. Some of these are untouched enlargements, as the excellent and artistic group of firs (No. 14). The photographs of Vernon Heath sustain that artist's reputation as a photographer of foliage and landscape. "Burnham Beeches," "A Peep into Fairy Land," "Hearts of Oak," &c. (No. 7), are brilliant pictures, full of detail and breadth of effect. Mellowness of intensity is a rather difficult attainment, but these exhibit that quality. Mr. Wainwright's "Studies," No. 20, taken on gelatine plates made by himself, are praiseworthy productions, full of detail. No. 26, "Instantaneous Effects" on Wratten and Wainwright's gelatine bromide dry plates are good specimens of the rapidity and sensitiveness of the process. The gelatine plate is a modification of the dry process, and is likely to supersede other modes of development where the time of exposure has to be curtailed, and where, as for landscapes, the cumbrous means for sensitising and developing, as in the wet collodion process, are objectionable. Messrs. James Valentine and Sons contribute some excellent landscapes and groups (28 and 40), and we cannot pass by some beautiful printings by William Bedford. The "Coast Scene, Ilfracombe" (41), is a fine rendering of rock, the detail being perfect. Other views of North Wales and Devonshire, by the same artist, will be admired by all lovers of photography. Some very telling and satisfactory work taken on gelatine plates are exhibited by J. Gale; we may call attention to the "Views on the Mole," "At Higher Brixham" (No. 53). Mr. Beasely shows some pleasing views, Kenilworth Castle, &c., on dry plates (56). The wet process is well represented in No. 59, where we see a series of very telling views, chiefly of Scotch scenery. Iona Cathedral, the Scott Monument, Edinburgh, "On the Coast of Iona," are well printed and brilliant samples. The views of Tintern Abbey and Raglan Castle (74 and 75), exhibited by Captain G. H. Verney, are excellent; the impressions are full and clear. The carte and cabinet portraits of children, shown by W. J. Byrne, are worth notice as creditable productions of the wet process. We are much impressed by the beauty and delicacy of detail in Nos. 97 and 98, "untouched enlargements" from a negative by the gelatino-bromide process, exhibited by J. D. Radcliffe. One represents a pine forest. The "Black Park, Iver," is also good. A very large and fine view of the Crypt, Fountains Abbey, by Woodbury and Co., is especially worth the notice of the architect. The simple grandeur of the Early English groined vault is admirably rendered in this photograph; the plain bevelled ribs spring from the bases of pillars, their clustered grouping forming the shafts themselves. No. 103, "Landscape" enlargement, by the same artists, is a fine example of foliage. Even more striking is the enlargement by the Autotype Company of Stoke Pogis Church (192), hung up at the end of gallery. We might almost mistake it at a little distance for a sepia drawing; it is a mellow, yet brilliant printing, and as an enlargement is one of the best productions we have seen. Messrs. Woodbury's large view of Pain's Hill, Cobham, is another striking enlargement from a negative by Captain Verney. The stately trees are forcibly reproduced, and the view possesses all the tone and depth of oil. In the same class of production the portraits of Gladstone and Bright (No. 128) are worth remark for the softness of the shadows. An exterior view of Fountains Abbey (136) is particularly striking as an enlargement, possessing all the brilliancy, crispness, and depth of a picture in monochrome. The near parts of the old ruin—the aisles, the grey tower, and the trees are admirably printed. As an example of the platinum process, the "Portrait of James Glaisher, Esq., F.R.S.," president, produced on Whatman's drawing-paper, by T. G. Hemery, is worthy notice. Mr. J. S. Hazard exhibits some "Fancy Dress Pictures" (154), taken between 10 and 6 p.m. by the agency of Luxograph light, and, as an illustration of high lights by artificial means, is all that can be desired. A few exquisitely manipulated views by H. W. Reeves are contributed (No. 189); they comprise Trinity Church, Stanmore Church, Willesden Church, &c. As instances of the rapid process of photography, in recording the fleeting objects of natural scenery, we must draw attention to a series of views by Col. H. Stuart Wortley (197 *et seq.*). "A Breeze from the South," "Catching Sand Eels," "A Study of Cloud," are remarkable sun-pictures; the clouds and waves are marvellous reproductions, in which the detail is rendered with perfect precision. In 204 the waves and the reflection and the fleeting light clouds are a perfect transcript of nature. Views on the Thames at Iffley (217), by A. S. Howman, is a creditable work; so is 245, by W. Huggins, views from gelatine plates, developed four weeks after exposure by Willis's platinum process. Mr. H. Garrett Cocking's Group of Members of the S. London Photographic Society (224), a carbon enlargement from a gelatine negative, is a very mellow and satisfactory work. Among the interesting instances of photography applied to mountain scenery is A. Pettitt's "Views of and from the tops of England's Highest Mountains." The cresting of the summit of Helvellyn is an admirable picture. Architectural subjects have been handled well by T. Stokoe, in his "Suffolk Church Interiors" (265), in which Swan's sensitised dry plates have been used successfully; "Ripon Cathedral" (273), by Woodbury and Co.; "Tintern Abbey," by Lieut. Darwin, R.E.; "Wells Cathedral," by J. Webber (372), must be noticed as masterpieces of the art. The west front of the latter cathedral (370) is a very fine view, brilliant in the high lights of the niched figures and details. Those interested in portraits will do well to note the extreme delicacy of the shades of white drapery produced by the gelatine process, as in the "Carbon Portraits" (288), by Messrs. Hills and Saunders; and particular attention may be drawn to the cabinet pictures by H. Rocher (308), and to his "Panel Portraits" (292), executed at Chicago, for brilliancy and artistic finish. As a recently-introduced process, the "Enamel Photographs," exhibited by the Autotype Company is worth attention, and appears to possess promise. They are by the tissue process, burnt in upon porcelain, and are of a pleasing light brown tone. As instances of pure photography without retouch they are excellent. The platinum process, in which silver and gold are superseded, is illustrated also by some admirable pictures and portraits. The views exhibited by W. Willis (341—352), printed in platinotype, are noteworthy; we may mention "Rustic Bridge and Foliage," "Arch of Chapter-house, Furness Abbey," "Bridge on the Dargle," and some portraits. On the screens we notice a few excellently-finished photographs. H. G. Cocking exhibits an Interior on gelatine plate; Mr. Stokoe a Reredos in Long Melford Church (358). A few portraits taken by the electric light by H. Van-der-Weyde and some dry-plate pictures are also to be seen. The views in India by A. T. W. Penn are an interesting and very pleasing collection, many of architectural interest. On the table are to be seen a few photo transparencies, and a portfolio of views taken by the platinotype process, exceedingly artistic both in subject and execution, by J. Hollyer. The old cottages and farmhouse in Kent are picturesque and suggestive bits of old work. We must not pass over the autotype enlargements and facsimiles by the Autotype Company, or the four studies painted by R. Elmore, R.A., in monochrome, and reproduced by this process (340). The Exhibition is well worth a visit, and we can recommend all admirers of photography and those who regard it as an important aid to art not to lose the opportunity.

VIOLLET-LE-DUC.

THE French papers* all speak in highly eulogistic terms of M. Viollet-le-Duc, and of the great loss sustained in his death. From them we glean additional information of his education and works. His father was "Conservateur des Batiments Royaux" (Keeper of the Royal Palaces), and lived in the Palace of the Tuileries, where the son, therefore, passed the days of his youth ; he (M. Viollet-le-Duc) was always fond of drawing, and used to amuse the King (Charles X.) by drawing portraits of the various officials about the Court. He began his travels very early in life, and made pedestrian tours through various portions of France, measuring and drawing all the Mediæval remains he came across, and which up to that time were despised or ignored by architectural students. When in want of money he returned to Paris, and either by the sale of water-colour drawings or by the preparation of designs for the decorator Ciceri, gained sufficient resources to enable him to start again. In 1836 M. le Duc left France for Italy in company with Monsieur Gaucherel, the well-known engraver and etcher; he visited Rome, Naples, Sicily, and Vienna, studying more particularly the Romanesque buildings in these towns, which were not much known then, and he made in the course of his studies many interesting discoveries, ascribing to many buildings a very different date from that generally received. At Rome he made the acquaintance of Monsieur Ingres, the painter, who was then the director of the Villa Medicis ; he assisted him with his advice, and obtained for him special facilities for copying the wall decorations of the Vatican and the Roman Baths. When he returned to Paris in 1838, he was well prepared for every kind of work connected with the practice of his profession. The exhibition of his drawings called forth praise from the architects and connoisseurs in Paris, and commenced his reputation. As noticed in our first article, a new field of study had just then been opened in France, and it was beginning to be noted that Art in France was not confined to the works of the Renaissance period. Certain archæologists, such as Merimée and Vitet, had written of the beauty of the Gothic remains, and had created an enthusiasm in favour of the picturesque works of the Middle Ages. Through these two writers, who had known M. Viollet-le-Duc from his youth, he obtained his first important work, the restoration of Vezelay. It would seem that his appointment as architect of Notre Dame was obtained through competition, whether for the design of the sacristy, the flèche, or the design for the spires for the western towers (the latter never carried out) we know not. It obtained, however, for him the first position among the Gothic revivalists. He was then thirty-one years old. The restoration of the Abbey of St. Denis, and the several cathedrals cited in our first article, together with many others of which we have not yet been able to obtain a complete list, followed at various intervals. The way in which these works were carried out is worthy of note. In all State works in France (and the restoration of the cathedrals and public buildings is always undertaken there by the State) the staff of the office is also nominated and paid by the State, and we believe in these cases the architect receives only 3 per cent. Instead, therefore, of having a large office in Paris, each of the works has its special staff, and all the drawings are made on the building. M. Viollet-le-Duc used to visit the works at certain periods, once a month or so, according to the importance of the work or the rapidity with which it was being carried out, and make his drawings on the spot, explaining them personally to the several artificers who were to carry them out. He was so well versed in all the manipulative processes that he was never at a loss to show the workmen how to carry out his design, and much of the sculptured decoration in the buildings he has restored has the trace of his own handiwork on it. His facility in drawing was most remarkable, and there must be thousands of designs for capitals and decorative mouldings drawn by him on tinted paper, the shadows indicated by a slight wash of Indian ink and the lights suggested in Chinese white. His numerous publications and the large number of drawings with which they are illustrated, all done by himself, must in great part have been prepared during his leisure moments in the evenings of the days he spent in his visits to works in progress. We are informed that the work of "How to Build a House" was written when surveying the Maritime Alps to make a plan of them for the French Government. Having been called upon to restore the Cathedral of Lausanne, he was so much charmed with the place that he built himself a villa, and passed the summer vacations, which of late he gave himself, there. His vacations, however, were not idle ones, and at the time of his death he was occupied measuring Mont Blanc, on which, we believe, he had already published a small pamphlet. He was an indefatigable climber, and showed a courage in his ascent which astonished those who knew him but in his professional capacity. It is recorded on one occasion, that on leaping across a precipice his foot slipped and he fell down, retained only by the cord which bound him to his guide ; the latter had been able to stand the first shock, but could not pull him up. Viollet-le-Duc, having satisfied himself of this, took out his knife and cut the cord ; his fall seemed certain death ; but, by the most fortunate chance, he fell across a jutting piece of ice, and from this position he was hauled up an hour and a half afterwards, with the assistance of other guides. The interval had been employed in making various drawings of new phenomena he had observed in the formation of the glaciers.

It would appear that he was himself acquainted with the tendency to apoplexy from which he died, though he studiously kept it from all his friends.

His death was so sudden and unlooked for that many of his intimate friends were unable to follow his remains to the grave. It was uncertain also at first whether he would be buried in Paris or at Lausanne. A special train left Paris for Lausanne with about a hundred people—architects, delegates from the Paris Town Council (of which he was a member), his pupils, friends, and others who had been connected with him in his profession. His son and grandson were the chief mourners, and they were followed by the delegates of the Swiss Federal Council, of the Council of the Canton of Lausanne and of the Municipality, eight members of the Municipal Council of Paris, three superior officers of the French army, in recognition of his works on military architecture and his grade as Colonel of Engineers during the war. Messieurs de Baudot, Bœswillwald, F. Narjoux, Berard, Darcy, Gauthier, Lafollye, Laisné, Sauvageot, Trelat (director of the Central School of Architecture at Paris), all architects, and various sculptors, painters, literary men, and contractors, followed by the greater part of the inhabitants of Lausanne, who had the greatest affection for the artist who had come to live in their midst. No speeches were made over the grave, by the special desire of M. Viollet-le-Duc in his will.

IRON IN CONSTRUCTION.

IN a paper on "Iron and Steel as a Constructive Material," read by Mr. J. A. Picton at Liverpool, a report of which we gave last week, the author, referring to the want of beauty that characterised our works in iron, asked, as we have done before, "Why architects did not face the difficulty, and, instead of letting iron master them, convert it into their handmaid and servant?" Mr. Picton reminded his hearers of the practice of Mediævalists in taking the materials which were before them and in adapting them to their wants in so admirable a manner. Why modern architects should not do the same might afford the theme of another paper. There are many who would be unwilling to admit that the Mediævalist would have used iron had it been ready to his hand, and, to judge from analogy, there is at least an improbability of his having done so. There might have been the same objections to the extreme tenuity of iron, its flimsy appearance, and to the mode of manufacture, that at present weigh with the profession. In the discussion of this question it would be some gain to know precisely, or to have stated, all the objections that the art-architect entertains towards iron as a building material, and then to see how far these could be met. Till we have a clear knowledge of the reasons that operate in the mind of the artistic against its employment, all attempts to force the material upon notice will be abortive. We are quite ready to concede that sentiment has a great deal to do with the natural repugnance to the employment of iron. The question is whether, if bridge-building became again within the architect's province, the profession would employ iron in preference to stone? No one can dispute the value of iron for bridging spaces and saving labour ; but would the architect in deference to sentiment, to the desire to do something picturesque, quaint, or antique, look at it when he can get stone or brick and timber? It appears to us the whole thing is a matter of education, just as it was thought heterodox a few years ago to employ any other style than Gothic, or to even hint at such a thing as to build houses with half-Classic features, although we are doing so now by the hundred under the name of Queen Anne. If the great and almost antipodal change from Gothic to Classic can be explained by an acquired and educated taste, it is not such a stretch of imagination to believe it possible that the architect's love for stone and timber may be shaken by a further acquaintance with the properties of iron and iron construction. Mr. Picton may well say how hideous to behold are the iron sheds, iron churches and houses we see erected ; but was not a plain brick house of the time of George II. or III. quite as hideous in our eyes a few years back? We are far from making an invidious comparison : the iron churches and houses are hideous, and will always remain so, inasmuch as the material has been misused and totally misapplied. The idea of casing a building externally with plates of iron is in itself a barbarous perversion; it openly contradicts all our sense of the fitness and propriety of material, and if by the use of iron is understood buildings cased with that material, it is perfectly certain that no civilised community would tolerate or sanction its employment. Of course as "the proof of the pudding is in the eating," we may reasonably expect artists of the old *régime* to say, "Show us a satisfactory iron building; convince us that iron can be used economically and artistically and we shall then, but not before, discard the old materials that centuries have tried and sanctioned." Before architects, however speculative or inventive they may be, will recommend their clients to adopt a new or untried material—it is only fair to assume they will demand some evidence or experience of it. Now, it is equally obvious that our first efforts must be tentative and partial. To refer to an iron church is to disgust any man of judgment or taste with iron; to endeavour to line the walls of houses with iron would be no less absurd. If iron is to be artistically employed it must be discriminately introduced, and we already ought to know what functions iron is capable of performing. Instead of employing it—to use a physiological metaphor—as a skin to clothe our building, we should employ it to obtain the osseous rigidity and muscular strength of our structure. We can use it wherever we now use timber, in any part where lightness and rigidity have to be combined. Unfortunately its great drawback is that of an uncomfortable sense of touch. If we adopt it for our windows, its very coldness is repugnant to our feeling of comfort, and beyond that, we cannot mould it or carve it into pleasing forms, but must be content to have it cast or rolled or forged. It is a powerful conductor of heat and cold, and it may be dangerous as a conductor of electricity. These are, without doubt, the serious objections to iron as an ordinary building material. Its nature is hard and unyielding, its very touch repulsive. Cast iron, after all, has a very limited use in our buildings. Even for such an indestructible purpose, we dislike it for our chimney-pieces. Can anything be more inartistic and uncomfortable than the cast-iron jambs and mantels we find in tenements? There is apparently only one use of metal that the architect at present can regard with satisfaction and pleasure,—we mean wrought iron handworked. He finds in the old Mediæval hinge, the encased lock and the hand-wrought gate-railing or grille, a source of extreme gratification, and for these purposes the value of iron is beyond a question. We wonder if it had ever been used for window tracery in lieu of stone we should have admired it also. We are almost afraid to say "Yes," or "No." With our present predilections and taste we should unhesitatingly revolt at the suggestion. To try and evolve from the depths of our mind any principles which would satisfy us in according to iron the position that timber holds now in the artist's esteem, would be difficult, if not hopeless. All we can do now is to observe and watch closely the various applications of iron in manufacture. For bridge-building, roofs of great span and stiffness, and for numerous purposes of structural framing, we all admit the value of iron. It forms an admirable skeleton, bracing and connecting the parts of a building, but the only mode of making it presentable to our taste is to clothe or encase it. Whether we shall ever be able to exhibit it with artistic pleasure is a point we must leave to the taste of another age. A metallic architecture has been mooted more than once during the last fifty years; a new style was actually proposed some time ago, but amongst architects of the present generation these ideas are deemed as visionary as the discovery of perpetual motion or the quadrature of the circle.

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* *Le Moniteur Universel*, *La République Française*, *Le Bâtiment*, *Le Soleil*, *Le XIX. Siècle*, *Le Siècle*, *L'Evénement*, *La Lanterne*, *La France*, and *La Gazette des Architectes et du Bâtiment*.

THE SOCIAL SCIENCE CONGRESS.

In the Health Department of the Social Science Congress, held this year at Manchester, an interesting discussion took place on Thursday week on

THE GROWTH OF SUBURBAN DISTRICTS.

Dr. Haviland, of Northampton, introduced the first subject on the paper:—"What are the evils resulting from the growth outside the boundaries of municipalities of suburban districts without due regulation and control?" He was of opinion that there ought to be no distinction between urban and rural authorities. At present the law with regard to rural authorities was too permissive. He believed that it ought to be made compulsory. Houses could now be built in the rural districts without any regard to sanitary arrangements. There was nothing to prevent builders from putting up houses on the most unhealthy sites without reference either to sewage disposal or water supply. He suggested that the Council of the Association should impress upon Government the necessity of giving the same powers to rural authorities as were now enjoyed by urban authorities.

Dr. Hardwick, the coroner for Middlesex, thought it a popular error on the part of working men that living in the country was so much more beneficial than living in large towns. In many country places the sanitary conditions under which the inhabitants were forced to live exposed them to evils far worse than were to be met with in large towns where proper sanitary arrangements were in operation.

Mr. Baldwin Latham said it was no longer necessary that a man should live in the country in order to be healthy. It was notorious that sanitary authorities had no control over the erection of dwelling-houses in the rural districts. Persons might build as they liked, on whatever plan they liked, without any regard to drainage or other necessary appliances for dealing with the waste of animal life. In nearly all the rural districts the death rate as a rule was not high, but when they came to deal with the question of deaths from zymotic diseases the rate of mortality was very fluctuating. He entirely concurred in Dr. Haviland's suggestion that an effort should be made to get the powers of the urban and the suburban authorities assimilated.

Mr. Fuller, chairman of the Withington Local Board, said he was in a position to corroborate a great deal of what had been said, from the fact of his having occupied the position of chairman of the rural sanitary authority of a very large suburb of Manchester, which within the last few years had been converted into an urban district. The application of urban powers to the district had been of very great advantage. Whether the constitution of urban districts all over the country would be desirable or not was a question upon which he was not prepared to express an opinion, but the constitution of many local authorities within the neighbourhood of large towns was, in his opinion, decidedly mischievous.

Professor Gairdner, late Medical Officer of Health for Glasgow, said he had some doubt whether the mere extension of urban powers would meet the difficulty. Glasgow had an evil reputation from a sanitary point of view, yet he thought he was right in saying that some of the greatest risks that Glasgow incurred was from epidemic diseases in its own suburbs which it could not meet, particularly with regard to small-pox. What was wanted was a scheme of inclusion that would compel all powers that ought naturally to co-operate in the meeting of epidemic diseases to do so.

Captain Galton said it was not at all clear that in order to secure health it was necessary to move out of the town. He was very much struck with some statistics bearing upon this subject which he had recently looked into. In St. Ann's, Soho, London, where the population was 331 to the acre, the death rate was 24 per 1,000. In Eltham, with a population of one per acre, the death rate was 18 per 1,000; but in certain model lodging-houses in London where the population was 1,140 to the acre, the death-rate was only from 16 to 18 per thousand. If in building our towns we were so to arrange the houses that there should be a free circulation of air, and that there should be no refuse matter left in their vicinity, we should be able to have a high standard of health amongst town populations, perhaps better than was very often got in the country, but it did not follow that it was not far better to live in the country if people could obtain all the attributes of health which the country afforded. The whole of the difficulty lay in the want of the education of the people.

The Chairman, Mr. F. S. Powell, said he believed we ought to have with reference to the whole of England a common set of laws on the subject of building. He had proposed that before the Sanitary Commission, but he was unable to have it adopted by that most intelligent body of men, because they felt there would be such opposition in the House of Commons that it must be rejected; but, nevertheless, he hoped the time was not far distant when that section of the Act which referred to building would be common to the whole to the country. Although the law might be the same, the by-laws need not be the same. The question of extended area was at the root of the whole thing. The great difficulty that had to be dealt with was the narrowness of the area under the jurisdiction of local authorities, and the limited salaries which those authorities were able to give to their officers.

On the motion of Dr. Haviland, seconded by Professor Gairdner, the following resolution was passed:—"That this section recommends the Council to memorialise the Government that in order to lessen the evils resulting to health from the growth of suburban districts outside the boundaries of municipalities, powers be obtained to bring both municipal areas and suburban districts within the control of one sanitary authority."

INFLUENCE OF SEWAGE FARMS ON PUBLIC HEALTH.

A paper on this subject was read by Mr Baldwin Latham, C.E. He drew attention to the fact that a large number of sewage farms had been established throughout the country, and that an investigation into the condition of the health of those residing in the neighbourhood of those farms, or working or living on them, showed beyond doubt that sewage farms were not prejudicial to health. It was further shown that when particular epidemics, as of typhoid fever, had been prevalent in the town of Croydon the neighbourhoods of the sewage farms did not suffer from the disease, but that the exposure of sewage as in irrigation appeared to destroy the noxious properties of the infected sewage. In conclusion, the author pointed out that if the healthiness of sewage farms could only be fully realised towns would not be mulcted in the heavy expenses which they now have to pay by reason of the opposition to the establishment of such works, and also for the alleged damage to adjacent land which had often to be paid when land was acquired under compulsory powers for sewerage purposes.

AIR POLLUTION.

A paper on "Air Pollution," which had been prepared by Mr. C. Estcourt, city analyst of the Manchester Corporation, was read by Dr. Haviland in the absence of the author. He said the visitor would see the effects of smoke pollution at a glance by comparing old and new buildings, and looking particularly at the metal work. Railings rapidly corroded if not kept well painted. The parks testified to a vain struggle by nature, and the people betrayed the effects of the black pall which hung over them. The consumption of coal in manufacture indicted that 150,000 tons of vitriol were annually showered over Manchester. If the blacks were diminished in quantity by careful stoking, the more perfect combustion would only increase the offensive and dangerous gases. Only one applicable machine had been thoroughly tried, viz. Mr. Johnson's, which had saved hundreds of tons of lead fumes. With this machine he had made a series of experiments which showed that both blacks and gases could be absorbed and the smoke rendered so harmless that it might be emitted in any quantity without causing a nuisance. The machine was in operation at the engineering works of Messrs. Goodfellow, at Hyde, Cheshire.

THE DECORATION OF PUBLIC BUILDINGS.

The special question for consideration in the Art Department was, "What subjects are most suitable for the pictorial decoration of public buildings in this country, and with whom should the selection rest?" A paper had been prepared by Mr. G. F. Watts, R.A., in whose absence it was read by Mr. H. C. Boyes, honorary secretary. Mr. Watts remarked at the outset that the interest taken in art by cities like Manchester was among the most encouraging signs of the times. It was not much that art should be the fashion with those who were at a loss how to get rid of time, but a strong desire for its presence in cities devoted to manufacture proved in them a real sense of its value. To provide interest and pleasure for a weary and disquieted population was one of the wisest uses to which our energies could be applied, and had become a duty to all who had any patriotic feeling. Under the circumstances of the present day it was no wonder if that part of the nation which ought to be its real backbone—the working classes—became often a prey to habits of intemperance, with a consequent disregard of decency in language and mode of life. To propose art as a panacea for all such evils would be absurd, but art and music were at least healthful influences and necessary portions of that general education in which alone there was hope. They were necessary, in the first place, as affording relaxation, and as active agents in keeping alive that elasticity of mind without which poverty was miserable indeed. Public buildings might, it was urged, be turned into great picture books, leading to considerable cultivation, in addition to affording a permanent source of pleasure. He pointed to the advantage derived from painting and sculpture being allied with architecture, and after remarking upon the beneficial influence which would accrue from the artistic decoration of churches, Mr. Watts offered some suggestions as to the subjects, instancing the "Te Deum" as peculiarly suitable for artistic treatment. Moreover, the best national school of decorative art could only be created by means of the decoration of national buildings. Without the habitual presence of art in the decoration of public buildings it could only be a luxury unknown in every-day life and valueless to the history of the nation. It might be said that by reason of the absence of art from its natural and most important place—the walls of our public buildings—many fine historical subjects had never been delineated at all, and some of the greatest qualities of our national character, such as solidity, manliness, sense of duty and right, courage in danger, perseverance under difficulties had been chronicled in literature, but were left untold to us in the language of art. He would name such subjects, for instance, as the abolition of slavery, the wreck of the *Birkenhead*, and many others equally worthy of the record of the pencil as of the pen. A small portion of the money spent upon the doubtful improvement of the breed of English horses, and of the energy expended in party violence, were it bestowed on earnest endeavours to encourage what was good, would go further than any political effort to insure a lasting national benefit. As one means of improving the national character he suggested the building of music-rooms, large, yet perfectly simple in structure, to be decorated with simple designs, wholly carried out and completed, fitted, and ornamented by students and workmen. In conclusion he remarked that we knew how much and how little the desire to grow rich could do for our happiness as a nation, and now let us try what the desire and effort to introduce beauty and harmony into our daily working life may do for us. A national art in a large sense was necessary to our future position in history, and it was probable that with due encouragement such an art, fraught with great vigour and character, might yet arise.

In the discussion which followed, Mr. G. Aitchison suggested that as our climate and the smoke and dust of towns militated against the maintenance of frescoes, it would be well either to paint in distemper and cover it with glass, or let the decoration be in mosaic. This material was almost imperishable, and he would be glad to see it used in the depiction of several of the stirring scenes of modern history. Professor Walker (Owens College) said there seemed to be a need for a stepping-stone in the way of an introduction to a knowledge of art in some form, so that the public generally should really know the lines on which they should go. It struck him that if in the elementary schools some small instructions in right principles were given there would be a germ implanted in the national mind which would ultimately bring forth good fruit. Mr. H. H. Statham advocated the selection by decorative artists of subjects of living interest in preference to abstractions.

ART AMONGST THE WORKING CLASSES.

Mr. T. C. Horsfall, Manchester, read the next paper, the subject being "By what means can the inhabitants of large towns be induced to buy examples of good art?" He remarked that photographs, photo-engravings, and chromolithographs of good pictures were now so cheap that well-paid workpeople could afford to buy several such copies every year. The crowds of workpeople round printsellers' windows showed that good pictures had some interest for workpeople. Why was it that, as a rule, only worthless engravings and coloured prints were found in their houses? The chief reasons probably were that few workpeople knew that some copies of good pictures were cheap, and they did not know enough about the subjects of the pictures they saw to care very deeply for them. For while one of the functions of pictures was to give pleasure by beautiful form and colour, pictures as simply beautiful things could not compete with flowers and clouds. To have enduring interest, pictures must excite thought and feeling, and they could only do this when the things which they represented were familiar to us or closely connected with things which were familiar to us. At present, owing to the workpeople's ignorance of the subjects of the noblest kind of pictures, only pictures which could not interest anyone deeply interested many of them at all. But if the culture of workpeople was to be deeply influenced by art, those pictures which when understood had the greatest power to interest, must be made intelligible to them. He suggested that in every town a number of people conversant with art should select such good, cheap copies of pictures as they thought could be made interesting to workpeople by explanation, and that they have printed on slips of paper—one of which should be sold with each copy—a statement of their reasons for choosing it, a brief criticism of its merits and defects, an explanation of the incident or thing which it represented, and of the connection existing between what it represented and incidents or things known to most workpeople; the price of the copy and of a simple frame for it. If printsellers would not sell the chosen copies and the printed slips, a collection could be placed in the local picture gallery, or arrangements be made for their being sold by the local agent of the Society for the Diffusion of Useful Knowledge. In Manchester the work of choosing and explaining copies of pictures would probably be undertaken by the Committee of the Art Museum, who had already undertaken to provide all the pictures in their collection with explanation and criticism.

THE SANITARY CONDITION OF MIDDLE-CLASS HOUSES.

In the Health Department on Friday the above subject was introduced by a paper read by Mr. J. Corbet, architect, of Manchester. Mr. Mark H. Judge, and others, took part in the discussion.

Mr. H. H. Collins (one of the hon. secretaries, and district surveyor of the eastern division of the city of London) gave it as the result of 25 years' active practice in sanitary work that the evils of bad drainage in existing houses might be remedied at comparatively small expense. He deprecated involving occupants in costly outlay such as "specialists" when called in occasioned, and stated that £25 to £30 expenditure would be all that was necessary to effect a complete remedy in medium-sized houses. If persons were only educated to the importance of the subject under discussion, the present existing legislation would be sufficient; the legal enactments were ample, but the difficulty existed in applying them. Professor Gairdner (Glasgow) said that whilst things were done as they now were by architects, builders, and plumbers, it was vain to suppose that an individual tenant could get at the root of the evil; but, on the other hand, he was not quite sure that the tendency which he thought the debate had assumed—viz., to throw the onus on the public authority—was the right solution. He would be very sorry to limit any good that could be done by the public authority, but it was stretching the point a little too far to say that the middle class of the country were to be supposed to be absolutely dependent on the public authority to keep their drains right and the condition of their houses sanitarily good. The following resolution was then adopted:—"That this section, whilst unprepared to recommend at the present time an entire conformity of rural to urban powers, is, nevertheless, firmly of opinion that such distinction is maintained with serious disadvantage to the community in regard to control of new buildings; and they would urge the Council to represent to the Local Government Board the logical and practical necessity that exists in regard to health in any future amendment of the law for enacting and imposing building laws that shall be of equal obligation on both town and country."

STREET ARCHITECTURE.

In the Art Department a paper was read by Mr. J. Murgatroyd, Manchester, on the following question:—"Is it possible or desirable to establish regulations for the improvement of street architecture, and for the prevention of the disfigurement of towns amd cities?" He thought that regulations might be established having for their object the prevention of encroachments on the public thoroughfares, the enforcement of such methods of construction as would tend to check the spread of fire and disease, and the enforcement of some predetermined design as regards the architectural treatment of a whole street or distinct sections of it. In the first place, the objects sought fell very properly under the jurisdiction of the local authorities. With reference to the second class he pointed to the styles of architecture which obtained in Continental countries in present and past times, and argued that we make a great mistake in planning our streets, as regards their direction, in making them straight, and, as regards their intersection, by making them at right angles. This was a point on which some authority might, he thought, very properly be clothed with power to exercise and dictate. Should any attempt at comprehensiveness of design be made, he did not think that a town council, as a body, should be the arbiters. The idea would have to be carried out by a skilled expert, or by a kind of art commission holding its authority from the local authorities. After discussing the question further, he said:—I come, then, to the general conclusion that it is desirable that the local authorities should regulate the position, width, and angles of intersection of our streets; that they should determine an average height for the elevation of the buildings; that they should, within reasonable limits, permit, but not too profusely, the projection of balconies and oriel windows so as not to interfere with the access of light to the street. The local authority should also stringently exact the erection of substantial party-walls and the carrying of them above the roof to prevent the spread of fire, and should for a like reason prohibit the erection of continuous wooden cornices, &c. It is desirable also that elevations of proposed buildings should be submitted to them, and that they should have a power to veto the carrying out of any design which is not sufficiently good for the neighbourhood, it always being understood that an appeal from their decision should be referred to some one out of a number of architects of known ability whose proclivities would not be adverse to the style of building proposed. Beyond this I do not think it desirable that any authority should travel.

Mr. H. C. Boyes considered that it was not possible or desirable to establish regulations as to the style of street architecture. He thought, however, along with other gentlemen, that the local authorities should have power to prevent important thoroughfares being permanently disfigured by "monstrosities" in the shape of railway bridges.—Mr. T. Chatfeild Clarke (member of the London School Board) took exception to the view that it was desirable to have streets curved rather than straight, and pointed to the pretty effect obtained in some parts of Paris, where the streets are perfectly straight, all monotony being obviated by the fountains, trees, &c., which are placed in front.—Mr. Aitchison suggested that a pleasing effect would be secured by covering the outside of houses with some glazed material.

BUILDINGS AND LANDSCAPE.

In the afternoon a paper on "Buildings and

Landscape" was read by Mr. H. H. Statham. It was illustrated by numerous sketches, showing the effects produced upon the landscape by the erection of buildings in different manners and in pursuance of various styles. In the course of the discussion advantage was taken by one or two speakers to condemn the Gothic style of architecture as a relic of the "dark ages." The Manchester Town Hall itself was even instanced as "enough to put Gothic out of fashion." Mr. Statham replied to these strictures, and expressed his admiration of the building designed by Mr. Waterhouse.

SANITARY LEGISLATION.

On Saturday Mr. F. S. Powell, the President of the Health Section, delivered an address in which, after reviewing at some length the duties and shortcomings of sanitary legislators and legislation, he summed up his conclusions as follows:—1. These subjects ought to be taken as one great whole, not as separate, and sometimes conflicting, problems. According to present practice, one engineer pours his sewage into a river, forgetful of river pollution; another, ministering to the necessities of a great community, conveys thereto water from the uplands, taking no heed to the mischief which he thoughtlessly inflicts on those lower down by diminishing the volume of the river which serves them; while a third, in devising a great scheme of drainage, ignores the value of the water which he is eager to discharge from the district under his control. In a word, as legislation until the year 1875 had been piecemeal in general enactments, it has been partial and fragmentary as regards localities. As in public statutes (under the influence of a more scientific conception of law) we now pass comprehensive enactments, so in private Acts we must needs regard the wider area of the county or province. In relation to drainage, navigation, and matters of a similar kind, there are, says the Lords Committee on Conservancy Boards, between 2,000 and 3,000 private Acts now in operation. Each of those Acts probably in some measure conflicts with public or private convenience and advantage in matters not within its scope. 2. The construction of works for water supply in the case of urban districts should be on a large scale, either by combination between lesser communities or by contribution to them of water collected by towns of greater size. 3. The water-supply should be constant. 4. Underground sources of supply should be diligently sought, and more freely made use of. 5. As to sewage, no single system is suitable for every district. The water carriage most convenient for one town does not serve the requirements of another, and the sewage farm which meets all the wants of this district is impossible in the overcrowded suburbs of the adjoining town. 6. The time of repayment of the loan should be so calculated as to give a wide margin not only for the natural decay of the works but for the advance of science, which may render them antiquated at an earlier period than the best men of the present day may believe possible. In this great department of sanitary work which relates to water supply the progress both of opinion and of action has of late been rapid and extended over a wide field. In the metropolis reform in the supply and distribution of water is accepted by Government and Parliament as a necessity and a duty.

THE DOMESTIC WATER SUPPLY.

Dr. Stevenson Macadam (Edinburgh) read a paper before the Health Section on this subject. He said all natural waters contained more or less saline ingredients, and all possessed a greater or less amount of organic matter besides gases in solution. Neither the saline nor the organic matters were necessarily impurities. They might be the constituents of wholesome waters. For cleansing purposes there was a decided disadvantage in hard water. For cooking purposes a comparatively soft water was advantageous. All waters when exposed to the air became more or less impregnated with organism, expecially in the warmer months of the year and in the warmer situations in the house. The common notion that soft waters acted more upon lead than hard waters was erroneous. He urged the importance of cleansing cisterns regularly, as a sediment was often found in them which contained sand and clay, accompanied by lime and much carbonate of lead in fine division, and a rapid influx of water might stir up the sediment, and render the water very deleterious. Water for town supply should not be collected in the neighbourhood of populous places, either from the surface or from wells. Three-fourths of the well waters in populous places were contaminated with sewage, and were unwholesome. Districts having hard waters were more likely to be influenced by the progress of agriculture, because they were generally more flat, whilst soft-water districts, being more hilly as a rule, were less capable of being turned into arable purposes, and hence remained strictly pastoral. The drawback to soft water districts was the presence of more or less peat, which communicated a greater or less tinge of colour to the water. A slight impregnation of the water with peat should not be considered objectionable, as it was not unwholesome. Many towns were supplied with the so-called peaty water, including Glasgow, Aberdeen, and Inverness, and there was absolutely no proof whatever of any noxious quality being derived therefrom.

Ths Chairman said he wished to know how hard water could practically be made soft water, and how far any noxious ingredients, whether chemical or vegetable, could be got rid of either by filtration in houses privately or by the local authority?—Mr. Meacham (Manchester) declared that the use of leaden vessels in connection with water for drinking purposes was fraught with danger and ought to be avoided.—Captain Galton said that filters in private houses ought to be regularly examined and the impurities deposited by the water removed, otherwise the filter introduced evils far greater than might result from drinking the water unfiltered. Dr. Macadam, in reply, said slate cisterns would, no doubt, be preferable to lead cisterns, but it would now be difficult to get rid of these latter. He did not approve of zinc cisterns for water for drinking or culinary purposes. Earthenware cisterns glazed with common salt would be safe, but if glazed with lead their use would be prejudicial to health. Hard water might be rendered soft by Dr. Clark's process of adding lime to it. He was "dead against" filtration, and believed that filters were sources of contamination. People went on for years without paying any attention to the state of their filters, and the results could only be very serious.

ART ADMINISTRATION IN ENGLAND.

In the Art Section a paper was read by Mr. J. Comyns Carr, "On Art Administration in England." He said the establishment of the Royal Academy had exerted a powerful influence over the progress of English art. Unfortunately, however, both for itself and the public, it had been guided by a narrow and impoverished conception of the duties it had undertaken to discharge. It had allowed itself to be outstripped by the art schools of nearly every capital of Europe, and some of the most distinguished members, including the president, had been forced to seek abroad for the technical training needed to fit them for their profession. The existence of the Royal Academy had been at every epoch in its history a powerful obstacle to the establishment of a national system of art administration, and from the date of its origin down to the present time it had persistently refused to entertain those larger responsibilities which had arisen out of the growing need of the English school. He thought the time had come when the cause of art could rightly claim the dignity of a direct representation in the Government. If they were to seek for the model upon which that might be done they had only to turn to the example of France, where the general directions of the fine arts formed one of the main divisions of public instruction. When they had secured what France already possessed, a central museum, like the Louvre, and a national collection of native works of art, like the Luxembourg—when they had established an annual exhibition as completely representative of contemporary achievement as the Salon, when they had a school of sculptors worthy to be intrusted with the decoration of their public monuments, and when they had devised some scheme for the adornment of their capital and the public encouragement of monumental design, then, and not till then, it would be time to preach in England the evils of art administration.

THE NATIONAL WATER SUPPLY.

The question for discussion by the Health Section on Monday was "The National Water Supply," upon which three papers were read.

Mr. A. T. Aitchison (London) said it was chiefly within the last 30 years that any marked improvement had been made in the water supply of most of our large towns. Innumerable small towns and villages, so far from making any advance, had retrograded; legislation was most needed for these, and extensive combination was requisite. By dividing the country into districts and sub-districts, as suggested by the Congress of the Society of Arts and contemplated in the Rivers Conservancy Act, the interest in the matter would be localised, and the direct management placed in the hands of those concerned. Instead of, as at present, appeal from the sanitary authority being made to the Local Government Board, it would be made to the district or sub-district board. The jurisdiction of the districts and sub-district boards should extend to all matters relating to the conservancy of rivers and watercourses, the maintenance of navigation, and the prevention or mitigation of floods within their districts, the examination of the available sources of water supply, the improvement and preservation of their purity, and the utilisation and disposal of the sewage of the population.—Prof. D. T. Ansted, in a further paper on the subject, said that he did not propose the supply of small communities. Except where water could be taken from channels near at hand, it did not seem to him that extraordinary provision could be made consistent with the economic working of any system. Of the two classes of available water—surface water and underground water—both were liable to receive, dissolve, and convey foreign substances, organic or inorganic, which might be called technically impurities, but which were really of little consequence in their influence on health; with regard to both, the process of oxidation converted the dead organic matter into harmless salts. In both, however, there was a liability to the presence of disease germs not to be detected by any means at present known, until they were traced to produce fever in persons predisposed. Besides the sources of water supply that existed in our rivers, there was, he pointed out, a large underground store—chiefly in the chalk and new red sandstone formations—that might safely be drawn upon where circumstances were favourable.—Mr. J. M. Fox also read a paper upon the subject.

In the discussion which followed, Mr. Baldwin Latham remarked that he was not in favour of Mr. Fox's plan of drawing a national supply of water from a single district, but he thought that local circumstances should be considered. What we had more particularly to look to was the preservation of our existing supplies of water from receiving impurities which chemists at the present time were unable to discover. The greatest danger to the public health arose from the pollution of the underground supply. There could be no doubt, he thought, that steps should be taken with a view to preserving areas once appropriated to water supply from becoming the habitation of man. For his own part, however he had great distrust of any Governmental interference. In a great measure towns would have to help themselves in the matter, and he thought that if they were energetic they would succeed.—Mr. Fox said he must raise his voice against any supposition either that organic impurity could not be detected in water, or that it could, when there, be uninjurious. It might be true that the particular poisons could not be detected either in air or water; but it would be equally dangerous to the public to say, on that ground, that either foul air or foul water was innocuous. Organic matter might be as easily known in water as bad smell in air, and the danger was that each might be the vehicle of a poison.

SIR COUTTS LINDSAY ON ART.

On Tuesday Sir Coutts Lindsay, President of the Art Department, delivered an address on "Art."

Sir Coutts Lindsay said it was unnecessary for him to urge any plea for the development of that region of human intellect comprised under the term "Art." The mind of the nation had undergone a great change, and he need only point to the fact that they were there, and to the meetings of that society during the last six years, as a convincing proof of the altered judgement of the country. If he enumerated the chief areas that formed the region of art, and which might justly come under their consideration that day, it was not that any single mind could deal with them in detail, but that it was well to keep before them the vast extent of the realm over which art holds rule. First and foremost stood poetry, with all her works of fiction; and then music. After those came the arts of architecture, sculpture, and painting, which, though they appealed to us through the eye, could not exist except by a process of construction wherein mechanical knowledge became a necessity. Under these great heads all minor arts must rank. To sever poetry from her sister arts was to deprive her of her supremacy and cripple the whole college. It had been urged of our English race that it was deficient in artistic power, and that, having produced no great schools of art during the flower of its youth or the flower of its manhood, when art led the van, no development of past seeds was likely to occur. Sir Coutts Lindsay then referred to the arts of this country during the present generation. In turning to architecture, he said You will at once perceive that it has been overwhelmed with the work of our generation. Churches in thousands have been constructed over the breadth of the land; our old cities are crowded with new public buildings, vast sums have been expended in the restoration of our cathedrals, whole districts have been laid under bricks and mortar. This has proceeded for many years with the breathless prosperity of the nation. This truth appears, that the present has no architecture, but culls from past times with the most perfect indifference. England does not stand alone in this respect; the same tendency is more or less visible in the rest of Europe. The architecture of our age has yet to be constituted, and this is the heart of the matter. I do not think it possible that a great school of sculpture can ever flourish in this country, although England has had, and will yet produce, many famous sculptors. A Constitutional Government (how I hate the term in connection with art!) is often niggardly, ignorant, and meddlesome; yet sculpture should be more dependent for its support on national than on individual employment. There is no love of sculpture in the nation, and, what is equally discouraging to our sculptors, the dignity of their art is ignored by their fellow Academicians, who have omitted to provide in the Academy even an elementary school of sculpture to guide the early efforts of its students. From sculpture we finally turn to painting, which is at present the spoilt child of the nation. Its growth has been abundant, its vitality great, its appetite omnivorous, and its taste varied. One spirit alone inspires these varied forms. Like the gods of old, she appears under numerous manifestations and many attributes, yet to the initiated she is known but by one name—that is Poetry. The soaring architecture, the breathing statue, the glowing canvas, the poet's song, the music that can ravish away the hearts of men, are but the creation of her spirit. We call her by divers names, and court her in many forms, but she is one spirit, yesterday, to-day, and for ever.

TREES IN TOWNS.

On Tuesday before the Health Section a paper by Dr. Phené was read on the sanitary results of planting trees in towns. He said that as far back as 1850 he planted several streets in the style of the French boulevards in a neighbourhood which, though at a low level, was shown originally to have been quite healthy, but in which a number of small houses had for a long time back been erected, and in which houses fever and diseases of various kinds were frequent. The state of health was much more decidedly good in the streets so planted than in surrounding neighbourhoods. Dr. Phené described the latest scientific experiments on the oxygenating property of trees, from which, he said, most beneficial results were manifest, and from which it was evident that the presence of fresh green foliage was a prime condition in the health of a dense urban population.

Mr. C. T. Kingzett contributed a paper on the eucalyptus and the pine, considered in relation to their sanitary properties. He said till recently there was no idea that the sanitary value of the pine tree was of the same order as that of the eucalyptus. His researches, however, had established the fact that both trees owed their hygienic influences, mainly at least, to one and the same cause. While the atmosphere of pine woods was known to be of great benefit to persons suffering from pulmonary and other affections, eucalyptus forests were not generally credited with the same power. He and others had satisfied themselves that these trees did exhibit very great sanitary effects, and particularly in connection with diseases of the malaria fever type. It had been abundantly proved that malaria could be entirely stamped out, even in the worst districts, by planting the eucalyptus in proper numbers. The sanitary value must be in the essential oil to which the aroma of pine and eucalyptus forests was due.

ART AND ANTI-RESTORATION.

Dr. Phené read a paper on the same day before the Art Section on "The Humanising and Refining Effects of Art" (the Greek and Roman periods).—This was followed by a paper entitled "A Phase of the Restoration Movement," by Mr. T. H. Hall Caine. The object of the latter paper was to condemn the disposition which, in the judgment of the Society for the Protection of Ancient Buildings, obtains in some quarters to ruthlessly destroy the relics of the past.

MR. CHAMBERLAIN ON RUSKIN'S "SEVEN LAMPS OF ARCHITECTURE."

On Wednesday evening, Mr. J. H. Chamberlain delivered at Birmingham, before the Fine Art Society, the first of a course of three lectures on Dr. Ruskin's "Seven Lamps of Architecture," the title of the lecture being "After Thirty Years." There was a large attendance. Mr. Chamberlain, in the course of his address, remarked that there were a good many books written and published about which it would be very idle to inquire thirty months afterwards, or even thirty days. There were not many books that really retained their hold upon the public for so long a time as thirty years, and when any special book did not only retain that hold, but increasingly so, and was read by ever-increasing numbers, it was worth while, perhaps, to inquire the secret of that popularity, and to try and see how far it had the elements of permanent endurance. For his own part, he might as well say at the beginning that which he might be expected to say, that he thought no more valuable book had ever been written on the art of architecture; and although there were some things they might be disposed to differ from, there were other things they might at least criticise in a friendly way. Yet, on the whole, he felt most strongly that Dr. Ruskin's book was essentially a true book and a great book; that it had had a most important vivifying influence with regard to architecture, and that influence was fated continuously to increase. If they were to understand the book he must very briefly sketch the kind of art which existed when it was written. The book, as they knew, was about architecture. Now, the question which would arise in every candid mind was, what was architecture? He should like to say he did not know—(a laugh)—and he thought the greater number of persons would also say they did not know. There was a large and excellent portion of the community that thought it something inseparably connected with 5 per cent. (laughter), but that was a side of the question to which he did not propose to address himself at all. Mr. Ruskin defined architecture as the art which contributed to a man's mental life, power, and pleasure, and as forming certain characteristics to a building venerable or beautiful, but otherwise unnecessary. According to Mr. Ruskin's definition, then, the thing he called architecture was wholly unnecessary—that was to say, from the ordinary outline of a building. He ventured to contest that proposition and amend it, and say that architecture did not consist, at least in the beginning, in adding unnecessary features to a building, but in taking advantage of the features they must have given them such shape or such form as was generally acknowledged to be beautiful, and which was perhaps—as he knew to his own cost—still considered by utilitarians to be unnecessary. Thirty years ago was the culminating period of the most disgraceful history in architecture that England or the world had had. It was the time when plastering had grown to a fine art; when the plasterer, the stucco-maker, and stucco-seller were most important persons, and when the covering of a building with stucco, to imitate stone, was considered architectural decoration. The ordinary architecture of that day was in two styles, and two only—one plain, the other—he should like to use a better word, but he could not find a better, and it was a hateful one—ornate. In that day, and he remembered it well, the churches, with hardly an exception, were built in that style known as the Classic style; and the architecture of the Nonconformist places of worship was also Classic, but a duller Classic than the churches. The public buildings were Classic, and if they wanted anything in the way of adornment they stuck up a portico as a colonnade. If they wanted illustrations of this class of architecture let them look at the British Museum, the General Post-Office, and their own Town Hall. The art literature of that day he described as dead as it could be; it was as dull as dust, and as dismal. A worthy gentleman named Ware, about 200 years ago, published a book which exactly illustrated the kind of literature he alluded to. The book was called "The Complete Body of Architecture"—no spirit; they knew nothing of the spirit of architecture, absolutely nothing at all; it was all body, and rather than being a book on architecture, was simply a book of various receipts, by which they might learn to beautify a building. Mr. Chamberlain explained that the styles of architecture then in vogue were Doric, Tuscan, Ionic, Corinthian, and Composite, and spoke of the effect Mr. Ruskin's writings had upon architects when he wrote in favour of the Gothic style in preference to the others. Mr. Ruskin's contention, he stated, was that unless their ornamentation could be referred in some way to some natural form, and the commoner the natural form the better, then their ornamentation was bad. That gentleman's "seven lamps of architecture" were sacrifice, truth, power, beauty, life, memory, and obedience; and to sum up the book in one clumsy sentence, art, if it was art, must be their best, they must give to it not only their leisure and pastime, but their heart, and soul, and strength; it must have truth for its foundation, power to make itself felt, beauty to cause it to be beloved, life that it might continue and increase, memory that its influence might be permanent, and, finally, obedience, that it might acknowledge and seek after the blessing of philanthropy.

THE ANCIENT STAINED GLASS IN EXETER CATHEDRAL.

At the annual meeting of the Exeter Diocesan Architectural Society held last week, Mr. F. Drake read a paper on "The Ancient Stained Glass in the Exeter Cathedral," which was illustrated by a number of drawings and paintings. Mr. Drake first referred to the works of the late Mr. Charles Winston, to whose careful labours was due the restoration of the art of glass-painting. He then observed that it was his intention to take his hearers first to the clerestory windows of the choir, then descend to the choir aisle windows, and finally take a somewhat hurried look at the great east window. He thought that there could be little doubt that the clerestory windows of the choir were filled with glass of a uniform design—figures beneath canopies and with tracery of a uniform pattern. The beautiful effect of such treatment might be imperfectly judged from the remaining window, although it had suffered severely from the ignorant over-attention of centuries of glaziers. The ground-work to the figures and canopies of all those windows had interlaced geometric bands running over oak, ivy, &c. The windows west of the transept were glazed at a later period, and enriched with the most beautiful specimens of the art immediately following upon the discovery of yellow stain. Two pieces only remained *in situ*. All the glories of figures, and canopies, and subjects, inscriptions, &c., were gone, yet portions were left which helped to form an idea as to the glazing. One of the two pieces remaining was identical with that of Temple Rothley, Leicester, so that the date of the glazing of the nave clerestory would be the early part of the reign of Edward IV. In the choir aisle windows there were six pairs, alike so far as the pattern of the stone-work was concerned, having bold borders. Much of the tracery of those beautiful pattern windows remained, but the lights, alas! were cut up into a kind of sausage pattern. The ancient glass in the chapels of St. Gabriel and St. Mary Magdalen remained so far as the north of the one and the south of the other was concerned. It was removed into the east windows, but, so far as regarded St. Gabriel's Chapel, it had been his privilege to put the glass back into its place. The grand east window received new stone-work in the Perpendicular style of architecture in 1390. At that time the glass of the earlier window was altered by one Lyon, of Exeter, to suit the new circumstances, and the best thanks of the city were due to Lyon for the satisfactory manner in which he did the work. The change resulted in the erection of a nine-light in the place of a six-light window. The early glass was placed in the six outer lights, and to make up the deficiency in length, dwarf canopies were placed beneath the figures and coats of arms emblazoned thereunder. Besides the six outer figures, there was much of the tracery-glass of an early character. The window suffered much in an attempted restoration in 1751. Heads of the true Georgian type were put upon the figures, and the canopies were much tampered with. The shields of arms in the tracery did not belong to the window. It was probable that in the general rummaging of old gear in 1751, when between 300 and 400ft. of stained glass was taken out of the Chapter House to be "worked up" in repairing existing windows, those shields were amongst it. The windows of both clerestory and choir aisle were of one character, executed upon one general plan, and were subordinated to the beauty of the building and the delicacy of the window tracery. There did not appear to have been the least attempt on the part of the architect to produce great effects of colour, but, on the contrary, all he seemed to have desired was toning and mellowing of the light which poured in floods upon the beauties of his glorious building. In conclusion, Mr. Drake alluded to the severe loss the cathedral had sustained in the death of Archdeacon Freeman, at whose suggestion this examination was made. The immediate fruits of his interest in this part of the fabric was found in the side windows of the Lady chapel, to the memory of Bishop Phillpotts. Had the Archdeacon lived, the poor skeleton of a clerestory window still, Mr. Drake hoped, reposing in the chamber behind the Minstrels' Gallery would ere this have been restored to its old beauty and its old place, and the glorious old east window would be far on its way to restoration—a consummation dear to his heart, and having the full and hearty concurrence of Sir Gilbert Scott.

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OLD ST. PAUL'S AND W. OF WYRCESTRE'S MEASUREMENTS.

THE measurements of old St. Paul's are still a moot question. The Rev. Dr. Sparrow Simpson printed a chronicle of St. Paul's from 1141 to 1341, in which under the year 1314 it is stated that the church was then measured as regards height, length, and breadth, and the length was 690ft., the breadth 130ft., and the height of the western ceiling from the floor 102ft., and the height of the new work 88ft.; the nave (cumulus ecclesiæ) 150ft. high, the bell-tower 260ft., the spire (fabrica lignea) 274ft., the total height, however, not exceeding 500ft. (*Trans. Lond. and Middx. Arch. Soc., Vol. V.*) Mr. Edmund B. Ferrey, relying on Hollar's plan, with his usual acumen, reduced the length to 596ft., instead of following Dugdale (*Hist. p.* 17) and Stow (*Vol. I.*, 640, *Ed. Strype*), and gives the breadth 104ft., including the side walls; height of roof, west part, *i.e.*, up to ridge of vaulting, 93ft.; height of roof to choir proper, 101ft. 6in.; height of roof at Lady Chapel (new work), 98ft. 6in.; height of tower, 285ft.; height of spire, 208ft. I do not remember to have seen the measurements given by W. of Wyrcestre. The length of the nave, 180 paces; the breadth of the arms (transept), north to south, 160 paces; the breadth of the nave and aisles, 48 paces; the length of the choir and Lady Chapel, 130 paces; the breadth thereof, 48 steps (*Itiner.*, 166). The hills above the Valley of the Wye are as lofty as the bell-tower of St. Paul's (p. 399). He gives the length of Winchester at 98 steps, and adds that the length of the old church was 128 steps (ultra capellam B. M.), exceeding that of the new church by 30 steps (p. 140); the foundations were actually found to be 40ft. in advance of the present front.

The inclusive meaning of ultra, as distinct from præter, is explained in his description of Glastonbury, "et 10 virgæ vel ultra le reredes sic in toto continet. . . ." There can be no doubt that virga meant a yard. Several of his measurements prove it (*Itin.*, 305, 306, 335), and he used a three-foot rule (*Ib.*, 306).

The Commissioners of Henry VIII., having an eye to the sale of lead, were bound to be exact. In the survey of Bridlington they give the length of the choir 58 by 26 paces. The eastern processional door of the cloister remains, and as at Wymondham, the old steeple into which it opened formed the central tower belonging to the Priory; the distance from its western pillars to the east wall was ascertained to be 125ft. The choir aisles measured 56 by 4 paces, the nave is 68ft. broad.

Bailey states the length of the pace to be 2ft. 6in., but happily the last person who employed this loose term is Dr. Whitaker, who says Eggleston (Athelstan) Abbey is 45 by 30 paces. I have recently measured it: it is 158ft. from E. to W. by 90ft. across the transept. The difficulty lies in reconciling the yard with Wyrcestre's "pace, gradus, gressus, steppys." The discrepancies sometimes arose from two different measurements, which perplexingly conflict. Quilibet gradus continet 8 pedes (pollices?), p. 244; ten pollices made nearly a foot [p. 190], and he makes 10 yards = 40ft.; 15 yds. = 30 p.; 5 yds = 8 p.; 17 yds. = 36 p.; 36 yds. = 54 or 52 p.; 42 yds = 60 p.; 40ft = 20 p. [p. 103].

4y.	.. 12p.	28y.	.. 50p.
6y.	.. 18ft.	30y.	.. 54p.; 60p.
8y.	.. 14p.	31y.	.. 58p.
9y.	.. 16p.; 18p.	34y.	.. 60p.
10y. 1ft.	.. 20p.	35y.	.. 60p.
12y.	.. 24p.	37y.	.. 66p.
15½y.	.. 26p.	45y. less 1ft.	72p.
18y.	.. 32p.; 26p.	50y.	.. 85p.; 70p.
21y.	.. 34p.	54y.	.. 85p.; 100p.
22y.	.. 40p.	58y.	.. 98p.
24y.	.. 40p.	80y.	152p.
26y.	.. 44p.; 46p.	60y. 180ft.	.. 90p.
27y.	.. 52p.	175f.	.. 90p.

The Franciscan choir at Bristol he reckons as (1) 28y. or 50p., (2) 54p.; the nave (1) 28 by 27y. or 50 by 52p., (2) 64 by 55p. (*Itin.*, 237, 284), thus further complicating the matter.

Previous writers have experienced a difficulty in estimating the length of the pace. Britton says, "His gressus was about 18½in." (*Bristol*, 49), while the editors of the new Monasticon suggest "about 19½ inches" (*Vol. I.*, 256). I will, however, give some test cases, with modern measurements added within brackets. Tintern, which I omit because measured by yards, is approximately correct.

Cirencester Church.—90 by 50st. (158 by 104ft.)

New College Chapel, Oxford.—84, in another place 88st. (136ft.), the transept 54st. (80ft.)

Wells Cathedral.—Total length, 200p. (388ft.); transept, 70p., in another place 72p. or 42y. (132ft.); the cloister, 80st. east side (159ft.)

Glastonbury Abbey Church.—192 by 38st. (550 by 64ft.); choir, 82st., 42y. or 74 by 40st. (150ft.); transept, 96st. (135ft.); cloister, 80st. (220ft.)

Winchester Cathedral.—Nave, 60 by 50st. (265 by 83ft.); the whole length, 98st. (545ft.); cloister, 84st. (178ft.)

Crediton.—120 by 32st. (228 by 58ft.); transept, 50st. (85ft.)

Muchelney Abbey Church.—104 by 30st. without the Lady Chapel (190 by 52ft.); cloister, 54st. (96ft.)

Malmesbury.—42st. (68ft.)

Exeter Cathedral.—190st. (383ft.); nave, 100st. (142ft.); choir, 90st. (131ft.); transept, 90st. (140ft.); cloister, 66st. (116ft.); chapter house, 30st. (75ft.)

Bristol Cathedral.—The nave, 30y.; 82 by 64p. (106ft. by 72ft.); choir, 24y.; 50p. (90ft.); chapter house, 56 by 18p.; 24 by 8y. (72 by 25ft.)

Salisbury Cathedral.—270p., total length (480ft.), 120p. transept (206ft.).

Now, the practical point is, Can any reasonable estimate of the length of the pace be formed? On the answer depends our knowledge of many churches now destroyed.

MACKENZIE E. C. WALCOTT.

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AMERICAN LOCKS.

WHEN good work abounds (says a writer in *Great Industries of Great Britain* for October) spurious imitations of it are sure to be plentiful; but the whole effort to discredit all the numberless productions of Birmingham, by calling them "Brummagem goods," was not more unjust and foolish than is the more recent habit of condemning as trumpery all the ingenious novelties introduced by American manufacturers. Instead of sneering at them, English manufacturers, if they are wise, will follow the example of the Americans. By their inventive wit and their mechanical tact they are superseding us, for instance, in the lock trade. They will turn out a serviceable lock and key which they can afford to sell for two or three cents, or we can buy from them another which is cheap at a thousand dollars. A curious specimen of the latter sort is the chronometric lock, the history of which may be given in Mr. Bain's words:—"The thief-proof safes of the United States," he says, "are, I believe, admittedly superior in quality to those manufactured in Europe; and, when burglars effected an entrance into a bank, they found they could not drill the safe in the time at their disposal: so they adopted a different mode of robbery. The gang seized and gagged the whole household. They then presented a pistol at the head of the manager and demanded the keys of the safe, and, as generally man will do anything to save his life, they got the keys, plundered the safe, locked it again, and made off, leaving the family gagged. Many burglaries of this kind have occurred in the United States. To prevent such a case happening, the chronometric lock has been invented. It is a mixture of a lock and a timepiece, and may also be a combination lock. Suppose the hour of closing the bank is five o'clock in the afternoon, and ten o'clock next morning that for opening it: the manager, when he goes to close the safe, sets the clock-work of the lock to ten o'clock next morning, and then locks the door of the safe. That done, it is impossible for anyone to unlock the door till next day. The key is of no use till the usual hour for opening the bank, when the chronometric arrangement in the lock drops a bolt, and permits the key to turn and the door to be opened. That particular lock is, perhaps, more ingenious than generally useful; but it illustrates the smartness with which the Americans contrive to meet every want, and threaten to render obsolete the older arrangements with which our own manufacturers think we ought to be satisfied because they were good enough for our forefathers."

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CHIPS.

The scaffolding has just been struck from the campanile and upper portion of the tower of the Holborn town-hall, now in course of erection from the designs of Messrs. Isaacs and Florence at the corner of Theobald's-road and Gray's-inn-lane. The building is Italian in character, and is built of red brick with Portland stone dressings. We have described it in detail in these columns. At the meeting of the Holborn Board of Works on Tuesday it was decided to erect an organ in the town-hall, at a cost of £380.

The town council of Dorchester on Tuesday adopted plans prepared by the borough surveyor for the drainage of a portion of the town.

The managers of the London Central District School, at a special meeting held on Tuesday, signed a contract with Messrs. Higgs and Hill for the building of day-rooms and probationary wards at the schools at Hanwell, at a cost of £13,420, and another with Messrs. Duke, Coulson and Co., for ironwork at the same schools, at a cost of £880.

The Markets Committee of the City of London Corporation on Tuesday accepted the tender of Messrs. John Mowlem and Co., at £109,000, for the erection of a fruit and vegetable market at Smithfield. The building will adjoin on the south the meat and poultry markets already erected, with which it will correspond in character and style. The designs have been prepared by Mr. Murray, in the City architect's office. A covered corridor is in course of completion connecting the meat and poultry markets.

Two additional metropolitan fire-brigade stations were opened on Tuesday—the one at Shooter's-hill, which has been built at a cost of £4,950; the other in Chapel-street, at the back of the Brompton-road, Knightsbridge, which has been altered at a cost of £1,200. The plans and designs were prepared in the office of the Metropolitan Board of Works.

The Gresham Lectures, to be delivered by Dr. Symes Thompson next week, will deal with "Air and Water as Supplied to our Houses."

The Aston local board of health, at its meeting on Monday, appointed Mr. William Brown, of the borough surveyor's office, Birmingham, as surveyor to the board at a salary of £250 per annum.

A meeting of 10,000 house carpenters was held on Sunday at Paris, when it was unanimously resolved that the operatives would suspend all work from the following day, exception only being made in favour of the employers who should signify their adhesion to the reforms demanded.

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ILLUSTRATIONS.

DENTON HALL, GRANTHAM.—BOARD SCHOOLS, TEMPERANCE TOWN, CARDIFF.—BUSINESS PREMISES, ALDERSGATE-STREET, E.C.—DETAILS OF ST. MICHAEL'S CHURCH, DITTON HALL, LANCASHIRE.

OUR LITHOGRAPHIC ILLUSTRATIONS.

DENTON HALL, GRANTHAM.

The drawing from which the double-page illustration of this important mansion published herewith was taken, was one of the most conspicuous drawings shown this year at the Royal Academy Exhibition. The house is in course of erection for Sir W. E. Welby Gregory, Bart., M.P., from the designs, and under the superintendence of Mr. Arthur W. Blomfield, M.A., architect, of Montague-place, W. The plan of the ground-floor which we publish with the view shows the building to be of an extensive and complete character, the planning of the several departments being exceedingly well managed. Owing to the absence of Mr. Blomfield from town, we are not able to give any detailed particulars of the building.

BOARD SCHOOLS, TEMPERANCE TOWN, CARDIFF.

Within the past four years the School Board of the Borough of Cardiff have erected certain school buildings in various parts of the town. One of these has already been illustrated in our pages. We now publish a second in order to show the substantial and sensible character of building adopted. In obtaining plans, &c., for their various schools, their procedure has been somewhat different from the general practice of public competition with its almost equally prevalent chicanery on one side, and deceit on the other. The board here have invited the four leading architects of the town to supply designs for, and carry into execution, one of their schools each, and may fairly adduce the different schools as proof of the wisdom of this policy. The schools now illustrated are from the designs of Mr. Geo. E. Robinson, architect, and have been carried out under his superintendence by Messrs. D. J. and D. Davies, contractors, Cardiff, at a total expenditure of £6,800, including all fittings and furniture. This sum, in fact, represents the buildings completed, and ready for work. The general arrangement is that of a girls' and infants' school, with the usual class-rooms on the ground-floor level, and boys' school over that of the girls. The total accommodation is 750; this divided into the sum above stated, gives the cost of £9 per child, and is in itself evidence that the outlay has been judicious; cubing out at something less than 5d. per foot. Unusual difficulty was experienced in obtaining a good foundation, as an extensive stratum of thin watery "slurry" underlies the whole of the buildings, at a depth of 9ft. below the surface. A firm base was obtained by carrying down square concrete piers 5 × 5 through this loose stratum, to a depth of 17ft., at distances of 6ft. between piers, and turning from pier to pier concrete arches. So well has this method answered, that no sign of settlement can be seen to indicate that exceptional difficulties had been met and overcome. Architectural embellishment has been rigidly excluded, and the result is due to the grouping of the buildings, and the effect of a well-broken sky-line, combined with a judicious selection of roofing material—that of the Broomhall Tile Company, of Blackfriars, London, who have supplied and laid the tiles with which the roofs are covered.

NEW PREMISES IN ALDERSGATE-STREET.

The Manchester Hotel, Aldersgate-street, London, was opened last week. It is situated at the corner of Aldersgate-street and Long-lane, opposite the Metropolitan Railway Station, and within a few minutes' walk of the General Post-office, the Bank of England, the Royal Exchange, and the Metropolitan Meat Markets. The photo-lithograph represents the Aldersgate-street front, and a portion of the return side to Long-lane. The building, which is seven stories high, including the basement, is designed in the Gothic style of architecture. The outside of the building is built with red bricks, and finished with stone dressings; the roofs are covered with green slates. The entrance is in Aldersgate-street. On the ground-floor is spacious corridor and hall with manager's office and porter's room near to the entrance; coffee-room 50ft. by 32ft., writing-room 35ft. by 28ft., which can also be used for a dining-room; smoke-room 60ft. by 24ft., lavatories, and other conveniences. The whole of these rooms are very elegantly fitted up with every comfort, well lighted and ventilated. The upper floors are approached by a handsome stone staircase from the basement to the top of the building. On the first-floor are public and private billiard-rooms, sitting-rooms, and bedrooms. The upper floors contain bedrooms, in all upwards of 200, with service-rooms on each floor. The kitchen, which was originally planned at the top of the building, is in the basement, and fitted up with the best and most approved fittings. The culinary offices adjoin the kitchen, all of which are well lighted and ventilated, and face Cloth-street. Leading from the entrance-hall is a staircase, communicating direct with the Aldersgate-street Railway Station by underground passage, by which visitors may go from the trains to the hotel under cover, a distance of a few yards only. At the corner of the building in Long-lane is a buffet with grill-room and dining-room over. The remaining ground-floor fronting Aldersgate-street and Long-lane is divided into shops, as shown by the view. The architects were Messrs. Bateman and Corser, of Birmingham, and the builder Mr. W. Brass, Old-street, City.

CHURCH OF ST. MICHAEL, DITTON HALL, LANCASHIRE.

To-day we complete our series of detailed illustrations of this interesting church, particulars of which were given with the plan and general drawings in the Building News for August 22 last. A double-page sheet of detail drawings has also been published, and will be found in our number for August 29th, illustrating the east end, chancel, and choir, as well as the nave arcade, which is a most distinguishing feature in the treatment of the interior of the building, on account of its rather unusual and lofty proportions, both clerestory and triforium being absent in the composition throughout. The conspicuous object in the landscape of course is the tower at the west end, and this we illustrate in detail to-day. Mr. H. Clutton is the architect.

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The new Catholic church at North Berwick was blessed on Wednesday, the 24th of September. The design was made by Messrs. Dunn and Hansom, architects, of Newcastle-upon-Tyne. A complete plan for a church and presbytery has been made, consisting of nave and sanctuary, 70 by 20ft., divided by a stone chancel arch; a north chapel, 28 by 12ft., with arches opening into nave and sanctuary, sacristy and confessional, and a presbytery adjoining. At present the funds available only permit of the completion of the nave of the church. The design is Gothic, of the Early Decorated period.

THE NEW VIADUCT AT LLANDULAS.

It is only a little over a month since the Llandulas viaduct of the London and North-Western Railway was swept away by the floods, and the main line of communication between Chester and Holyhead cut in two by a gap over 220ft. wide. The massive stone bridge which had previously crossed the stream at this point, and which consisted of six piers, and seven arches, the latter each some 28ft. span, had broken away from the embankment on either side, and been pitched bodily over into the stream. No time was lost by Mr. Webb, the chief mechanical engineer, and locomotive superintendent of the London and North-Western Railway, Mr. Frank Stevenson, the chief civil engineer, Mr. Smith, the district engineer, and those who acted with them. A new bridge, stronger in every respect than the one which was washed away, has already taken its place, and the traffic is now carried over it, and indeed has been for more than a fortnight past. To prevent a second flood undermining the piers of the new bridge, Mr. Smith has put inverts of solid masonry between them, protected by concrete, so that the water in passing under the bridge goes over a stone roadway; the inverts and arches being again protected by aprons. While the piers were in process of erection Mr. Webb was busily occupied with the portion of the work which he had taken under his special care, viz., the construction of the steel superstructure which was to top the piers. Crewe was set to work, and in a marvellously short space of time the steel was made, and the huge girders, each span in single plates and angles 32ft. long, thus avoiding butt straps and cover plates, were dispatched to Llandulas. Mr. Webb gave himself ten days to put the forty-two girders together, and to complete the steel work of the viaduct; but those who were most competent to form an opinion thought the feat an impossibility. It will be seen, however, that Mr. Webb had not miscalculated either his own capabilities or those in his employ, for in seven days they had completed what was pronounced impossible in ten; and in another seven days the whole was erected. In a month from the first break-down, indeed just under a month, the bridge was completed. The bridge is probably the longest viaduct of steel in the three kingdoms, and as such, heralds a period when this metal will to a considerable extent supersede wrought iron for constructions of this kind. The examination by the inspector of the Board of Trade took place on Monday week, with very satisfactory results, the deflection in the centre of the spans being only about one-sixteenth of an inch, with two engines passing over head to head. The difference in the deflection at the centre of the spans, and close to the piers, was scarcely appreciable.

CHIPS.

It is proposed to erect in Gloucester a memorial statue in marble of Professor Wheatstone, the principal inventor of the electric telegraph, who was a native of that city. The first third of the estimated cost, £750, has been raised.

The principal corner-stone of a new Primitive Methodist chapel was laid at Bucknall on Monday. The style of the chapel is semi-Gothic, and accommodation will be provided for about 200; another portion of the chapel being used as a school. The architect is Mr. Elijah Jones, of 18, Pall-mall, Hanley; and the builder, Mr. J. Roberts, jun., also of Hanley.

The new slipway and gridiron at Penarth Docks, near Cardiff, were formally tested on Saturday. They have been constructed by Mr. W. E. Jackson. The gridiron (350ft. in length) was designed by Mr. George Cooper, the manager of the Penarth Shipbuilding and Ship-repairing Company; and the slipway, which is 867ft. long, by Mr. John Thompson, of Newcastle-on-Tyne.

The Eastgate and Market Hall, Warwick, are being repaired by Mr. Cashmore, builder, in accordance with plans prepared by Mr. F. H. Moore, architect.

Additions have just been completed at the board schools, Mold; Mr. I. Aydon is the architect, and Mr. R. Roberts the contractor.

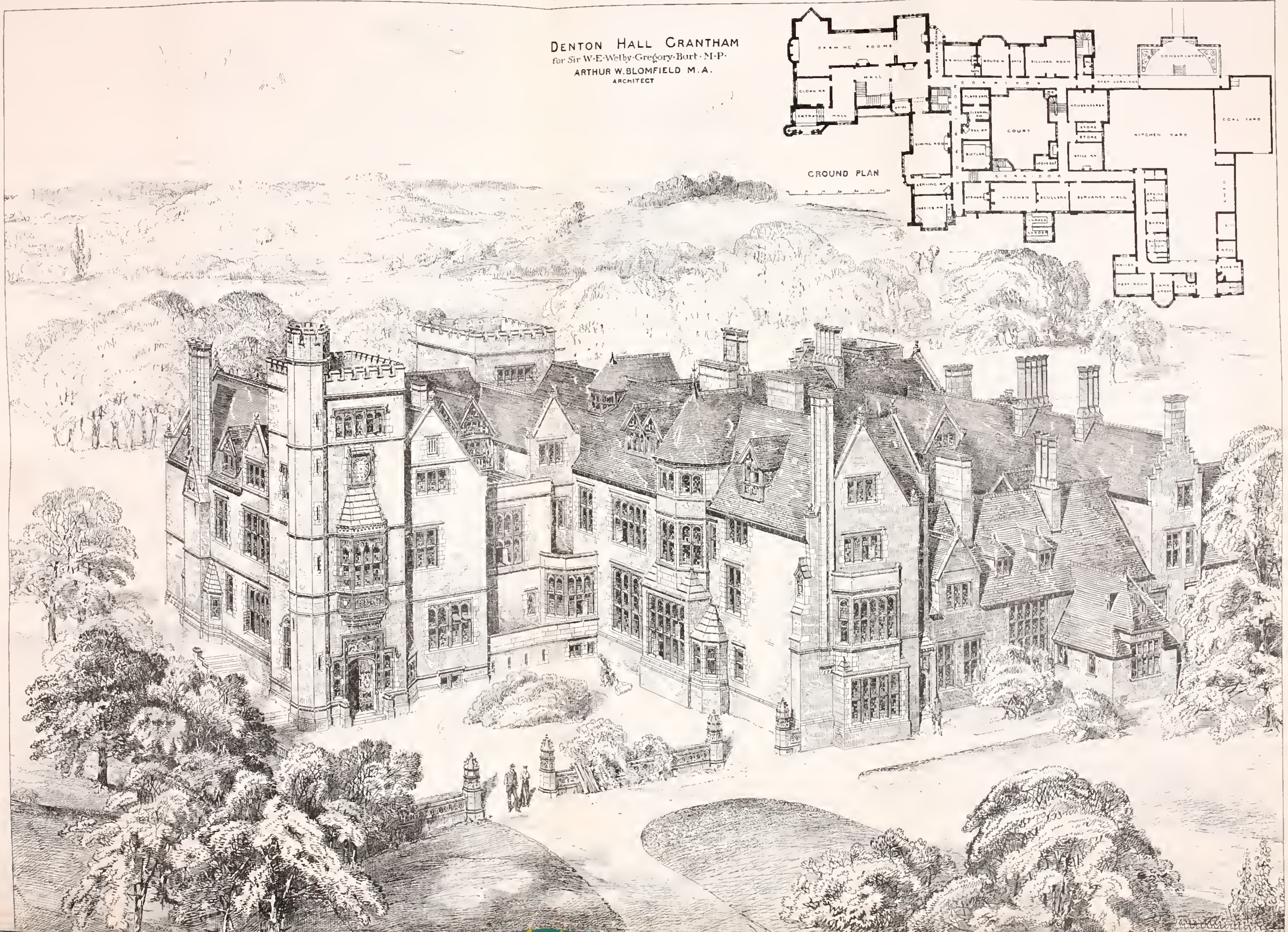
The town of Lewes is about to be drained from the specification and under the supervision of the borough surveyor, Mr. H. C. Card.

New board schools for 600 children are about to be built on land adjoining the viaduct, Preston-road, Brighton, from the plans and specifications of Mr. Thomas Simpson, architect to the Brighton School Board.

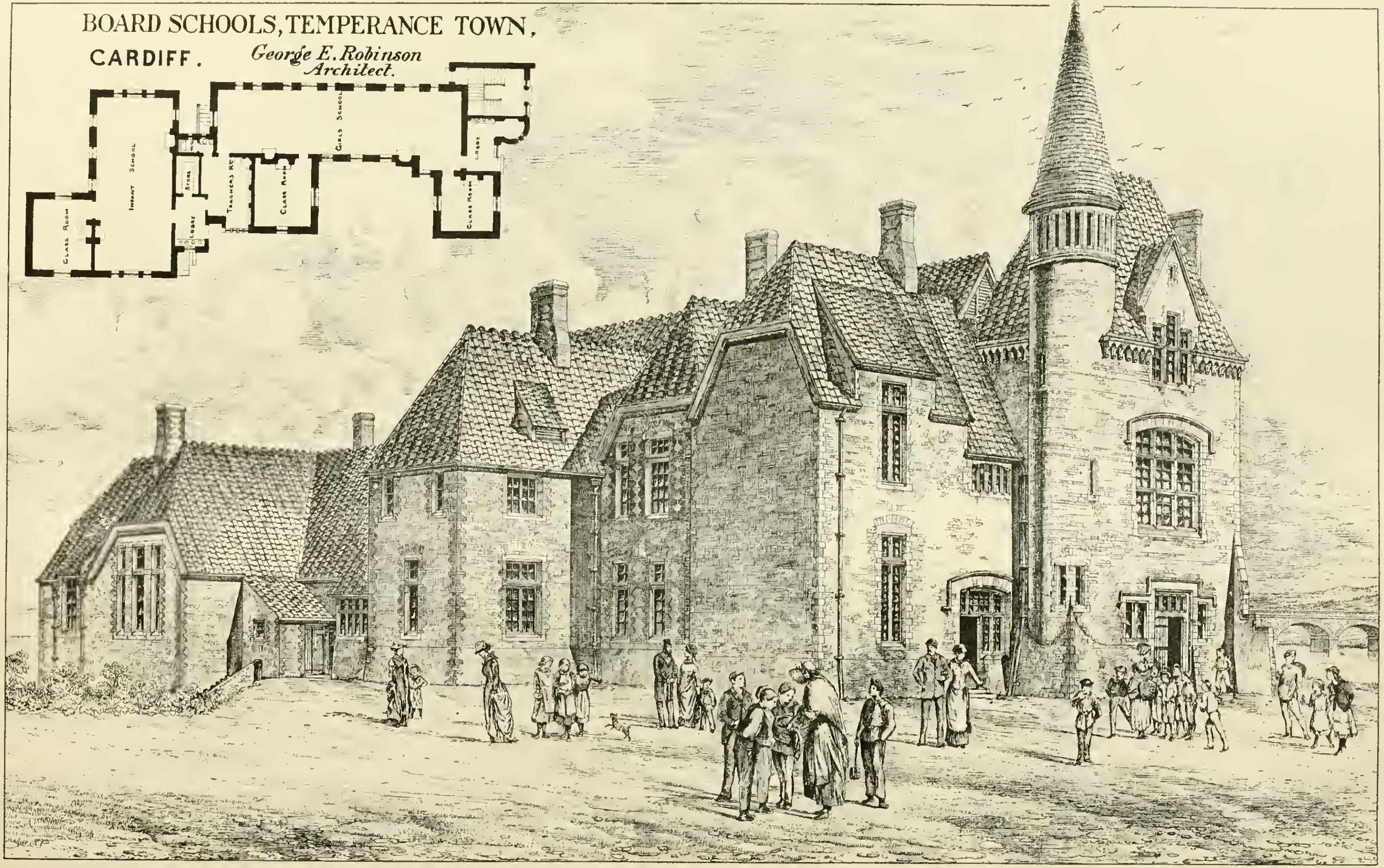
DENTON HALL GRANTHAM

for Sir W·E·Welby·Gregory·Bart·M·P·

ARTHUR W. BLOMFIELD M.A.
ARCHITECT



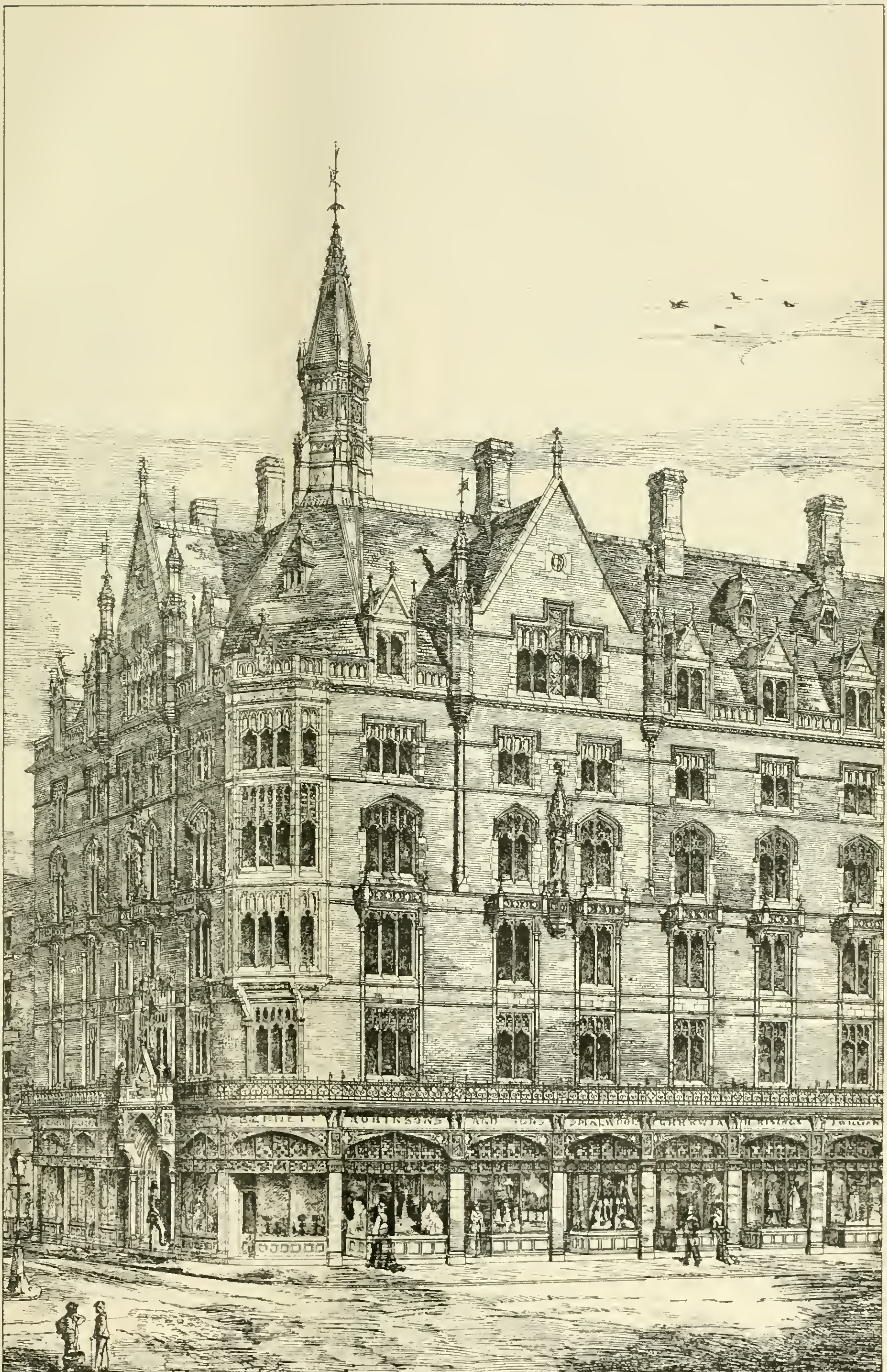
GROUND PLAN



BOARD SCHOOLS, TEMPERANCE TOWN, CARDIFF.

George E. Robinson Architect.

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.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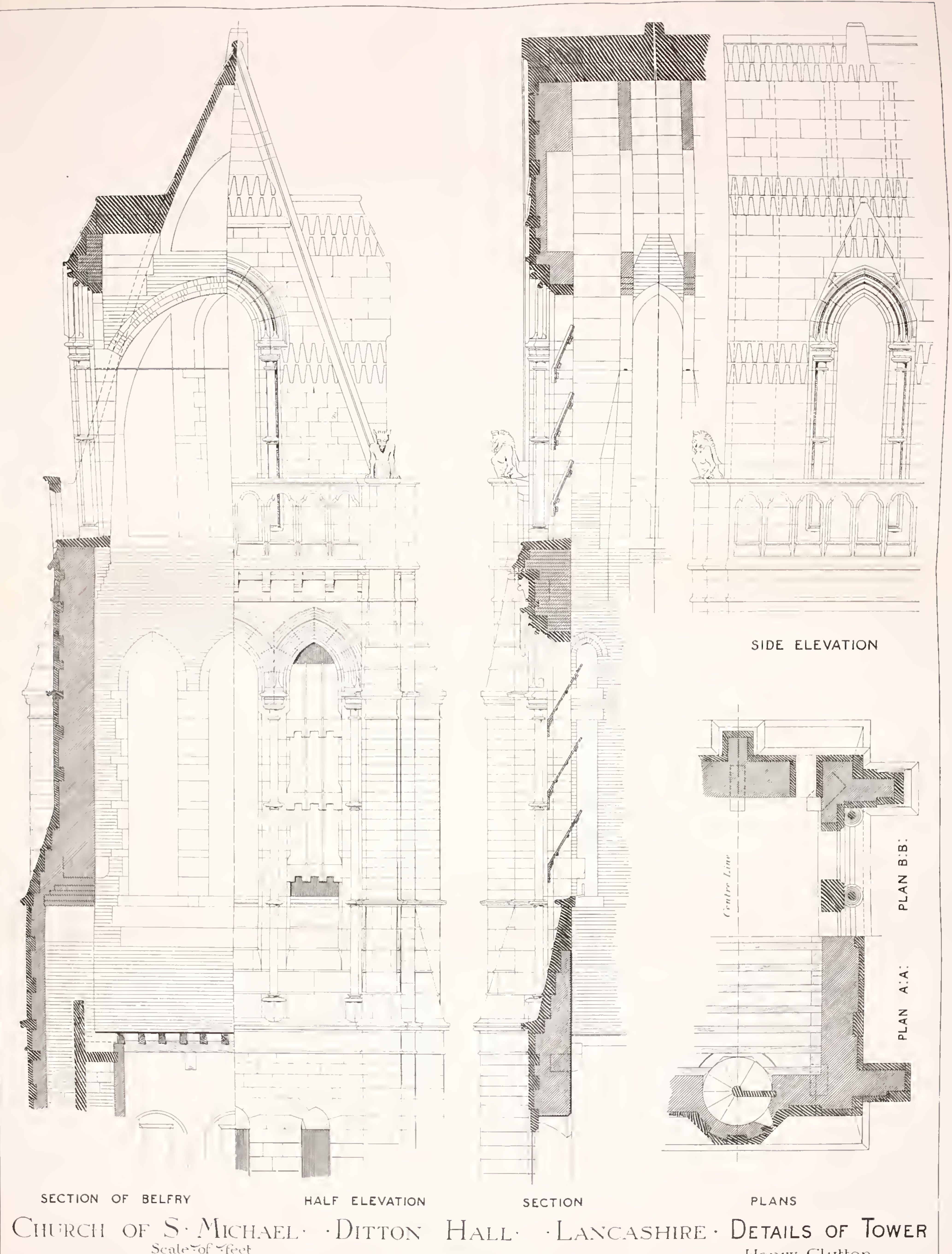

SECTION OF BELFRY HALF ELEVATION SECTION PLANS

CHURCH OF S· MICHAEL· ·DITTON HALL· ·LANCASHIRE· DETAILS OF TOWER

Scale of feet
10 5 0 10 20

Henry·Clutton
ARCHITECT.

MAVRICE B ADAMS del.

Photo-Lithographed & Printed by James Akerman 6, Queen Square W.C.

"BUILDING NEWS" DESIGNING CLUB, NEW SERIES.

RULES OF COMPETITION.

1. Drawings to be sent in 28 days after the publication of the list of subjects.

2. Usually two subjects will be given every month, from which a competitor may choose.

3. The drawings to be executed in firm black lines on white drawing-paper, in sheets of the absolute size of 22in. by 14in., with no washes or tinting in colour whatever. Outline to be the first consideration; but drawings may be slightly shaded with shadows executed wholly in line. Sectional parts to be shown in ruled "hatching," or blocked in. The scale to be used will be given with each subject.

4. Drawings to be forwarded unmounted, by post, care being taken to roll the short way of the drawing, as packages over 18in. long are not transmissible through the post.

5. On entering the class (which may be done at any time) each competitor is required to furnish his name and address, which must be written legibly on the back of each drawing, as a guarantee of good faith, the *nom de plume* the author intends to adopt being boldly marked on the front of each separate drawing.

6. Prizes of £10 10s., £5 5s., and £3 3s. will be awarded to the best series of designs, such series not to consist of less than twelve subjects. Our decision to be final.

. Before awarding the prizes any contributor will be expected to furnish proof, if necessary, as to his age, and the time during which he has been engaged in professional pursuits, though no candidate need be strictly an architectural student.

8. We reserve the right of arranging the drawings for publication in any manner we deem necessary.

9. A critical notice of the designs sent in of each series will be given in an early issue following the receipt of the drawings.

LIST OF SUBJECTS.

1. A coffee-tavern for a small country town, on a corner site, containing a bar, coffee-room, a reading-room, billiard-room, kitchen, and offices, with two bed-rooms for attendant. Cost not to exceed £1,500. Plans, two elevations and sketch. Scale for drawings, one-sixth of inch to foot.

2. A design for a hall-table and clock, in case, in oak, the former to be 4ft. long and 1ft. 6in. deep, the latter to be 6ft. high. General drawings, 1½in. to a foot, and details quarter full size.

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OUR COMMONPLACE COLUMN.

INTONACO.

An Italian term generally applied to the coating of plastering upon a wall or ceiling; more properly it means the finishing coat.

IONIC ORDER.

The Ionic order is the second of the Greek and the third of the Roman orders. The earliest known example is that of the Temple of Juno at Samos, though the proto-Ionic is to be found at Persepolis. In the Ionic temples the height of column varies from 8¼ diameters to 9⅓, the height of entablature is about 2·280 diameters in the Temple of Minerva Polias, the height of capital 0·700, and the intercolumniation 3·5. The honeysuckle or anthemion is the usual ornament in Greek examples. *Italian Order.*—Perrault gives the following proportions for entablature: whole height, divided into ten parts, the architrave having three, the frieze three, and the cornice four. Another rule for general purposes divides whole height of order, including pedestal, into five parts, giving one part to pedestal; the order, including entablature, is divided into six parts, allotting one part to entablature; and the column is next divided into nine parts, giving one part to diameter of column (or 60 minutes) and 50 minutes to upper end of shaft, and 1 diameter and 48 minutes to entablature. See Gwilt's "Encyclopædia," also works of Vitruvius, Palladio, Perrault, Vignola, for details of subordinate parts and the projections.

IRON.

In the following notes we confine ourselves to the more practical uses of iron as employed by the engineer and architect, referring the reader to treatises on metallurgy and other general works for information upon the ores, and the processes of smelting, &c. The "hot blast" process, by raising the blast of air introduce into the furnace some 800° or 900° Fahr. economises fuel, but many of the impurities in the ore are reduced to a molten state and run out with the metal; thus an inferior iron is sometimes produced. Hence, specifications often require that cold blast iron is to be used. Sir W. Fairbairn speaks of the probable injury to cast-irons by the hot blast, though it has frequently mollified and improved those of a harder nature. He says:—"Considering the small deterioration that the irons of quality No. 2^1 have sustained, and the apparent benefit to those of No. 3, together with the great saving effected by the heated blast, there seems some reason for the process becoming general as it has done." (See Fairbairn's "Iron Manufacture.")

Cast Iron.—The differences that exist between cast iron, wrought iron, and steel, the three chief products of manufacture, chiefly depend on the quantity of carbon they contain. When carbon is absent, or in very small quantity, we have wrought-iron, which is soft, malleable, ductile, and weldable. When present in certain proportions we have steel; and when present in greater proportions than in steel we have cast iron, which is hard, brittle, readily fusible, but not forgeable (see Percy's "Metallurgy"). Cast-iron contains about from 2 to 6 per cent. of carbon; steel about ·15 to 1·8 per cent., and wrought iron about 0·25 per cent. The varieties of cast iron are classified into *grey cast iron* made from foundry pigs Nos. 1, 2, 3, of which there are three kinds; *white cast iron* containing very little free carbon and of a silvery hue, extremely hard and brittle, unfit for castings for building purposes; and *mottled cast iron*, which contains both the grey and white varieties; *chilled iron* and *malleable cast iron*. Mr. Matheson says that malleable iron castings should be used for the shoes and connectings pieces in roof structures.

Sir W. Fairbairn, in his work on the "Application of Iron to Building Purposes," recommends the following mixture as being of great value in castings such as girders for bridges, beams for buildings, &c.

Low Moor, Yorkshire, No. 3 ..	30	per cent.
Blaina or Yorkshire, No. 2....	25	,,
Shropshire or Derbyshire, No. 3	25	,,
Any good old scrap	20	,,
	100	

In designing castings, it is necessary that the changes of form and thickness should be gradual; all sharp angles are a source of weakness, and should be rounded off. Great differences of bulk in adjacent parts should be avoided, as the smaller parts cool and contract more quickly than the larger, and unequal stress is thereby created in the casting. Panels and girders with cross diagonals are apt to crack if the parts are not graduated easily. Mr. Matheson says, speaking of testing, "a strength capable of enduring 25cwt. on the test-bar without fracture should be the minimum quality allowed, even for short and heavy columns; but for other purposes a load of from 28 to 30cwt., and a deflection of 5-16in. should be demanded." The amount of deflection of the test-bar before fracture is very important therefore.

Wrought Iron.—The different qualities of bar-iron, the result of rolling, are called (1) "Puddled Bars," known as No. 1, or rough bars, a weak quality; (2) "Merchant Bar," or common iron known as No. 2, still inferior, and brittle, and used only for common purposes; "Best Bar," obtained by repeating the processes of piling, reheating, and rolling, used for ordinary good work; "Best Best" iron bars, those that have been submitted to several repetitions of the above processes; and "Scrap Bars," made from short pieces, and of two qualities. Wrought-iron girders can be rolled with ease up to a depth of 10in.; when of a greater depth the upper and lower portions are sometimes rolled separately, and then united by inserting a piece of iron containining more carbon, and therefore more fusible; this piece is then submitted to a fierce heat from blowpipes and well hammered, so as to weld the upper and lower portions of girder together. "Cold Short Iron" is a very brittle sort.

Tests: —Mr. Kirkaldy's experiments have shown that the mere tensile strength was not the best criterion of quality. He has found that the breaking-strain does not indicate the quality, as it may be due to iron of a superior quality dense fine, and moderately soft, or simply to its being hard; while a low breaking-strain may be due to coarseness of texture or extreme softness. He found that the *contraction* of area at fracture, previously overlooked, was an essential element in estimating the quality. Mr. Kirkaldy, of Southwark-street, has admirable machinery for testing purposes, and receives every kind of engineers' work. From the scale of tensile tests prepared by that gentleman we find that the "Best Best" bars should stand an ultimate stress of 25 tons per square inch, with a contraction of 30 per cent. at area of fracture, and angle ⊤ iron 23 tons per inch with 18 per cent. contraction, and plates about 20½ tons per square inch with 9½ per cent. contraction.

Factors of Safety.—For cast-iron the Board of Trade requires for girders with dead load a factor of safety of 3—6; Stoney puts it at 6. The same authority recommends for pillars 6, and pillars subject to vibration 8, do. to transverse shock 10.

For Wrought-Iron girders subject to dead load a factor of safety of 3 is recommended, and for a live load 6; for mixed bridges 4; for roofs the same.

Working Stresses.—The following working stresses may be adopted in practice:—

Cast Iron.—For girders carrying a dead load: compression 8 tons per square inch; tension 1½ tons; shearing 2 tons. An allowance of 30 per cent. may be made to cover defects such as air holes, &c.

Wrought Iron.—Built-up plated girders in tension (deducting rivet-holes in the tension flange) 5 tons per square inch; compression 4 tons; shearing 4 to 4½ tons. Some engineers deduct for rivet-holes in both flanges. The Board of Trade rule observes that "in a wrought-iron bridge the greatest load which can be brought upon it, added to the weight of superstructure, should not produce a greater strain on any part of the material than 5 tons per square inch." For rolled girders the stresses may be a little higher than those given above; bar iron in roofs used in tension may be subjected to still higher stresses. We refer the reader to Bindon Stoney's "Theory of Strains," Unwin's "Bridges and Roofs," Prof. Rankine, Sir W. Fairbairn, and other works.

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HALIFAX PARISH CHURCH.

Halifax parish church was reopened on Tuesday. The church, which is one of the oldest and largest in the North of England, had got into an extremely dilapidated and dirty state, requiring alterations which have cost about £16,000. The present restoration has been in progress for the last eighteen months, and during that time the church has been closed. The work was originally designed and carried on under the direction of the late Sir Gilbert Scott, and since his death it has been completed under the superintendence of his son, Mr. John O. Scott. Mr. Thompson, of Peterborough, was the contractor.

The main idea of the present restoration was to transform the church from one where the choir and organ were placed in a gallery at the west end, to one in which the choir occupy stalls in the chancel, and the organ is placed in the north aisle, as in cathedral churches. The galleries are gone, and that end of the church is opened to the west door, which it is now intended to use as an entrance to the church. The screen which cut off the tower arch from the nave has been taken down. Several monuments have been removed to leave the space clear, and the west window, with its beautiful old leadwork, has been cleaned and restored. The doorway opening to the tower stairs is retained, but a new doorway has been cut, giving access from the outside, at the west end of the south side of the tower. In the belfry there is a new oak floor resting upon oak beams each 18in. by 12in., these in turn being supported by an iron girder. Fourteen bells—twelve of them in harmony—are hung on one level, the prayer-bell having now been placed in the belfry. The clock has been carefully repaired and cleaned by Mr. Marshall, of Halifax, who has the management of it. There is a descent of five steps from the tower floor to the floor of the nave as far as the font, and two more steps to the general level of the nave. The space westward of the south and north doors, formerly the ante-church, is now seated with new oak pews of the same pattern as the old, with this exception, that the new pews are without doors. The door leading into the partly-built tower at the west end of the south aisle has been opened, and in the recess (there are no steps) is placed a hydrant, with buckets, hose, &c., for use in case of fire. The window between the porch and gable of the south aisle is filled with stained glass, presented by the Vicar's Bible Class. It consists of three lights, with tracery of the Perpendicular period. Numerous other windows have been erected by private individuals. The font is untouched, except that a new base, octagonal like the old, has been supplied. The noble font cover, of rich tabernacle work, has been stripped of its paint, and the oak left exposed to view. The fine south porch has had its roof restored, and an alteration having been made in the level, the inner doors have had to be lengthened. These, and the old oak all through the church, have been stripped of paint. The north porch, which had a roof of deal, has had that replaced with one of oak, and new outer and inner doors are supplied. While the south porch gives access to the church on the level, there is a descent of four steps from the north porch, the nature of the site making this unavoidable. From the south porch to the first pier beyond the central arch the pewing is the same as before, except that it has been rearranged, that the height of the pews is reduced to 2ft. 8in., and that renewals have been made where necessary. The doors are retained. The colour of the oak, after cleansing, is very good, and the whole work has been done with great care. The walls are stripped of plaster and pointed with white mortar. This stripping leaves exposed to view an incised tomb slab built into the west spandrel of the central arch opening into the Holdsworth Chapel. The monuments that were on the piers have been placed on the walls, and the piers have been repaired where necessary. Some of them, indeed, needed considerable reparation, having been damaged alike by monuments and by the pewing. The bases were much cut, and in a few cases new bases have had to be supplied. The pulpit stands on the south side of the middle aisle. It is of oak, hexagonal in shape, and much enriched by carving. The gas lighting of the nave is by fourteen brass coronæ, hung in the aisles, one corona hanging close to the crown of each arch in the nave arcades. Each corona is of elaborate design, with six branches, and in each branch are six lights. The roof of the north aisle of the nave was taken off and restored where restoration was needed. It remains the old pitch, and the unique wall posts have been retained, but are made to spring from oak corbels, which are new. The roof of the south aisle is new, of a design copied by Mr. Scott from the north aisle. The ceiling of the nave, containing in panels the arms of the vicars, from the first vicar in 1274, is left as it was, except that two of the panels have been raised, so as to bring into view the crown of the tower arch. The Holdsworth and the Rokeby chapels have undergone great changes, as also has the choir. The nine miserere seats are preserved, and others are made to correspond with them, whilst new choir stalls have been provided which afford 60 seats. The organ occupies the third bay of the north aisle, counting from the east. The organ case, which was illustrated in the Building News of July 11 last, and is of wainscot oak, is one of the best pieces of carved work in the church. It is florid Perpendicular in character, and rises from the floor of the choir to within some four feet of the panelled roof of the nave—a height of 35ft. The organ itself was built by the renowned John Snetzler, who was born at Passau about 1710. In connection with its recent removal to the east end of the church, the organ has undergone a number of material improvements, which have been carried out by Mr. Abbott, organ-builder, Leeds. The sacristy has been altered. The wood floor has been taken up, and the vestries are now arched over. There is a rise of eight steps from the floor of the nave to the platform on which stands the altar, itself new, and of good design in oak. The old Communion-rails are preserved, with some slight alterations. The floor of the sacrarium is laid with black marble and white Silician marble, arranged principally in a large diamond pattern; and the three steps within the rail are of very finely marked marble from Frosterly, in the county of Durham. For the present, a dossal will be hung behind the Communion-table, under the east window. Within the Communion-rail is placed the old sedilia, of oak, which was found among the miserere seats. It had been cut so as to be uniform with them, the top portion of one standard having been removed. This has been supplied, and also figures at each end. The sedilia was in a good state of preservation, and is now perfect. Outside the fabric, the parapet behind the south porch has been rebuilt; and new cross and saddle-stone have been placed over the central arch; the pinnacles on the south side of the chancel have been restored; new parapets are placed on the Rokeby Chapel, and the north aisle of the chancel and the pinnacles there have been repaired. The north aisle of the nave roof and the south porch have been reslated, and others of the roofs are covered with lead.

SHEFFIELD.

SHEFFIELD is very like a smut upon the fair face of a beautiful woman. No blacker town exists in all England, and yet, few places can boast of more charming surroundings. Sheffield, in itself, with a population of nearly a quarter of a million souls, possesses scarcely a single good street, and although the contemplated improvements for which an Act has been granted will be productive of great ultimate good, yet it must be a long time ere Sheffield is on a par with the great cities of Great Britain, from an architectural point of view. And yet, with a good general knowledge of much that is most picturesque in England, we can think of few scenes that vie with Wharncliffe Craggs, Riverlen, Stanage Rocks, Millstone Edge, or a score of other places in the immediate neighbourhood of Sheffield for stupendous majesty, and almost savage glory of scene. But, this paper will not admit of more than this passing allusion to the town generally, nor to the locality in which it stands. We propose here to treat upon—and that but very briefly—the new buildings at present in progress in Sheffield, and only, if occasion offers on some future time, must other matters of general interest be embraced. The new Midland Hotel just erected stands at a good corner, and is a Classical building of moderate pretensions, built of red brick, with stone dressings, and having polished grey granite pilasters upon its ground-floor. A melancholy interest is associated with it, in that is the last work of the late Mr. Charles Unwin, the father of Sheffield architects, who, at a good and venerable age, has recently gone to his rest. Looking back from this hotel over the railway station to the steep rising ground behind, it may be noted that the Sale Memorial Church, a Gothic building erected there from the designs of Messrs. Flockton and Abbott some few years ago, has just received the addition of a south-west campanile. This is, however, weak and poor, altogether too small for the church it is designed to beautify.

A good building, in the Late Tudor style, is the Norfolk Drill Hall, now fast approaching completion, in the Queen's-road. It is being erected for the 4th West York Artillery Volunteers, at a cost of £10,000. The foundation-stone of the structure was laid by the Duchess of Norfolk on September 25th, last year. It has been designed by Messrs. Hadfield and Son, architects, of Sheffield, and the contractors are Messrs. A. Handyside and Co., of Derby. The dimensions of the hall are: length 180ft., breadth 90ft., and height 40ft. The drill hall is covered in by an iron roof, constructed much after the same principle as that of St. Pancras Station, London. The floor is boarded, and on one side the walls are pierced with 6 embrasures. Running parallel upon the other side is a large gunshed, where six guns are mounted. These point inwards towards the hall, and consist of three 64 pounders, one 26 pounder, and a couple of 40 pound breech-loaders. Besides this, there are other outside drill sheds. The façade facing the road is a well-considered building, built of patent pressed and moulded bricks of a warm red colour, with stone dressings, sparingly used, in the shape of cills and mullions to the windows. There is a massive central tower rising 60ft. The front buildings comprise the officers' and non-commissioned officers' mess-rooms, canteens, instructor's house, armoury, and all other necessary appointments. The building just described is situated close by St. Edmund's Roman Catholic Schools—another of Mr. Hadfield's jobs, and a very successful one too. These schools were opened about eight months ago. In the immediate neighbourhood, but nearer Highfields, is another capital school of Messrs Hadfield and Sons. This is St. Wilfred's (also a Roman Catholic). Tudor in design, and carried out in red bricks, these schools are very extensive, and show many well-considered details. The roofs are of red tiles, and there is a piquant bell-turret covered with lead. Stone dressings are sparingly used. There are two good life-sized exterior niches, in which statues of the Virgin and Holy Child and of the Patron Saint are placed. These schools, which are now ready for opening, have been built by Mr. George Wade, builder, of Sheffield, and are erected at the expense of the Duke of Norfolk.

Over the bridge that crosses the river close by, is Healey, and Healey is in Derbyshire; for this little river is the defined line that marks the division between that county and Yorkshire. In a straight line from this bridge, and up a steep ascent, is Myrtle-road, and at the top of Myrtle-road are Mr. E. R. Robson's new Board Schools. These schools are just upon complete, all indeed, save the approaches, is finished. The schools are plain greystone buildings, stamped by the Queen Anne pediments which have made Mr. Robson's London School Board schools such pronounced features. The most prominent thing about their exterior are two great chimneys, crowned by common pots, and joined together, Siamese-twin fashion, by an altar-rail-like balustrading of stone. Under this is a connecting arch, just below the springing of which, suspended by a bar, is a small bell. Bentley and Burn are the contractors for these schools, the cost of which has been about £13 a head. The view obtained from this site of Sheffield with its thousand and one high chimney-stalks rising out of the valley beneath, is as comprehensive a one as can be obtained anywhere.

A new Wesleyan chapel, known as the Trinity Methodist Church, has just been opened in Highfield. It is an Early Gothic building, of respectable appearance, standing immediately opposite to St. Barnabas' church, a church boasting of as atrociously-designed a tower as will be found anywhere. The Wesleyan chapel in question has been erected from the designs of Mr. J. D. Webster, architect, of Sheffield, at a cost of £10,200. It has many good points, but in detail lacks the vigour exhibited in that gentleman's New Women's Hospital in Leavygreave-road. This hospital—illustrated from an admirable drawing by Mr. Maurice B. Adams, in these pages, Aug. 4, 1876,—is one of the most successful erections in Sheffield. The management of the eastern end of the Highfield Chapel, as seen from the exterior, is by no means pleasant; but the weakest point is undoubtedly the spire. Its design is poor, and the masonry is anything but what it should be—the lines of the various cants being carried up far from true. Much better, in many respects, is a new church Mr. Webster has in hand in Summerfield-street; a building so far advanced that it is now being slated in. It is of Early Gothic type, and consists of nave, aisle, and short apsidal chancel. The western end abuts on the street, from which there are two entrances, and at the north-west angle there is a bell-turret. The site of this church is in a pit, sadly disadvantageous to the building, but much pleasant, quiet detail is exhibited throughout, however. The clerestory consists of seven lancet-headed windows on each side, and the lean-to aisles are lit by three-light windows. The dressings are of Hollington stone, and the steep-pitched roofs are covered by slates. The nave and aisles are divided by triple arcades, the columns being red Mansfield. The roofs are open timbered. The building looks as if it will be ready for opening next spring. Mr. Thompson is the builder.

The Sheffield Improvement Act embraces many sweeping changes. All one side of Fargate is gradually passing away, and new houses, set well back, are arising. It is to be hoped however, that in the designing of the new buildings a fair chance to the profession generally will be offered. At present one enterprising "firm" seems to be having it very much their own way. If we are to judge from the new erections already put up in Fargate, new blood might be introduced with advantage. Sheffield, within its own bounds, owns over three dozen members of the architectural profession, and it seems desirable that these gentlemen should have some finger in the pie, as well. They might not all produce a plum, but we think that

Sheffield—from an artistic point of view—would reap the advantage. One side of Church-street has disappeared, and in many other parts of the town houses and whole streets are doomed, and are already upon the move. It is estimated that the entire cost of these new public works will be £600,000.

The omnibuses of Sheffield are fast being "improved" from the face of the town. A system of trams belonging to the Sheffield Tramway Co. run everywhere. It might, perhaps, be as well to put some reservation upon the word "run." Not a few of the Sheffield streets are narrow and winding, and in these one line of rails ought only to have been laid. Instead of this there are two, the result being that trams cannot pass in many places anything that happens to be in front of them, and are, therefore, obliged to crawl along at a snail's pace for quarters of a mile together.

From time to time this journal has given illustrations of some of the charming schools erected for the Sheffield School Board by Messrs. Innocent and Brown, architects, of George-street, Sheffield. These gentlemen have already built about twenty board schools in that town, and the series are, as a whole, perhaps the finest in the country. The Lansett-road Board Schools, now nearly complete, have just been erected from these architects' design. They are in two blocks—one for boys, and the other for girls and infants. The boys' school is in one story, over a covered playground; the girls' is in two stories. The walling is of Walkley stone, and the dressings are of Ancaster. These schools are capital in arrangement as well as in design, and the management by which (by glazing internal walls) the headmaster commands from his seat a view of the class-rooms, as well as of the main schoolroom, is worthy of notice. These educational buildings, designed for the reception of 950 children, have been built by Messrs. Chambers and Sons, of Sheffield, Mr. Dickinson beiog the clerk of works. Messrs. Innocent and Brown have also another school in hand for the board at Woodside. This school has been planned to meet the requirements of the Government maximum of £10. Their cost will be £9 10s. a head, which includes all requirements. These schools have white glazed bricks in the corridors up to a height of 5ft., a pitch-pine dado 4ft. 6in. high running round the various rooms, and are being thoughtfully and even luxuriantly carried out. The character of the work is a trifle later than are some of the other schools these architects have done. The walling is of Walkley stone; the ashlar and dressings of Grenoside. The schools are designed for 950 children, but only one block for 630 is, at present, being put up. Messrs. Sharpe and Son are the builders, and Mr. Dickinson clerk of works. Another Board School, which will be known as the Burgoyne School, is to be built. Messrs. Innocent and Brown have prepared designs, and tenders are now advertised for. These schools will accommodate 933 children.

But the principal schools, indeed, we may say, the chief work now going on in Sheffield, are the Central Board Schools, the School Board offices, and the Firth College, three distinct buildings, merging the one into the other at the bottom of West-street. But it is very doubtful whether this group, seen from any point of view, externally, or from the inside, can be deemed successful. Indeed, the general feeling in the town is one of considerable disappointment, for the expense has been enormous, and the return not what was anticipated. The contract price for the schools and offices only was £42,000; of this £10,000 has been swallowed up by the latter, leaving £32,000 as the cost of a school for the accommodation of 960 children. As already mentioned, the three buildings are continuous, and present a long, low façade, the central group being the lowest, and quite dwarfed by its neighbours at the two flanks. The details throughout are flat and meagre, not to say mean, and particularly so is the balustrades above the main cornice, the curious broken quasi pediments over the windows, the urns, the angle pilasters, the iron railing, and the thin bars of the window-frames. One end of the building abuts awkwardly upon West-street, and over the entrance there is an oriel window. This oriel has *one* central mullion only, the effect being particularly offensive. In the main front, this unfortunate arrangement is again repeated. The members of the School Board met in the new offices for the first time last week.

The Firth College is to be opened next week by Prince Leopold. The cost has been about £12,000, and the schools will be finished the beginning of next year. I have already said that Messrs. Robson and Flockton are the architects for the triple group, and Mr. William Bissett, their builder.

The new Corn Exchange, built at the expense of the Duke of Norfolk, from Messrs. Hadfield and Son's desigos, is beginning to show itself. It is in the Tudor style, and red brick is being used principally in its construction. When complete, it will face the new continuous road that will then connect the two stations of the Midland and Sheffield, Manchester and Lincolnshire Railways together.

At the corner of Commercial-street, and opposite to the post-office, one of the busiest centres of the town, the Midland Banking Company are erecting new premises. Mr. S. L. Swann, of Sheffield, is the architect. The plan is already up some 30ft. Messrs. Chambers and Sons, are the builders. This bank reminds one somewhat of Mr. Gibson's National and Provincial Bank in Threadneedle-street, worked out 6in. to a foot. Mr. Gibson's bank is majestic, and has a nobility about it that it will be almost impossible for Mr. Swann to secure with the space he has at command.

A large new cemetery is being built for the Borough of Sheffield upon the Intake-road. Messrs. Hadfield and Son are the architects. There are to be three good chapels upon the grounds; the best, the Roman Catholic one, will be at the expense of Sheffield's munificent neighbour, His Grace the Duke of Norfolk, E.M. A little further on, another cemetery for the Gleadless and Intake district is now ready for opening. The chapel and lodge, in the Perpendicular style, are particularly picturesque and pleasant. They are built of Dunford stone, with dressings of Ancaster. The boundary walls have wrought-iron gates and railings. Mr. W. J. Greenwood, of Woodhouse, was the contractor, and he has carried out the job from the designs of Messrs. Innocent and Brown, architects.

A large fever hospital is erecting at the end of Winter-street. The roof is being put on. Mr. S. L. Swann is the architect.

A Blind Asylum has been erected at a cost of £15,000 upon the Manchester-road, and was opened a week or two ago. It has a commanding site, and has been built from the designs of Mr. Gibbs, architect. The contractor was Mr. J. Hall Thorpe, of Leeds. Messrs. Johnson and Son, of Sheffield, did the upholstery work.

Just above it is a large mansion, built of stone, brick, and timber work, at a cost of some £10,000, by Messrs. Hadfield and Son, architects. The house, which is for Mr. J. Fowler, a Sheffield merchant, is, perchance, a trifle straggling, but is cleverly designed, and offers, in many points, a pleasing contrast to the majority of large houses upon the outside of Sheffield.

Sheffield is not noted for the number of its beautiful spires. The best is undoubtedly the oldest, that of the Parish Church of St. Peter. This is a central-crocketed spire of great beauty. Next to it in merit, perhaps, is that of St. Marie's R.C. Church, in Norfolk-row, a Decorated building erected from the designs of Messrs. Weightman and Hadfield in 1851. These two, and a very graceful one, by Messrs. Innocent and Brown, on the Baptist Church in Glossop-road, are, amidst the multitude, the only ones worth noticing.

The Parish Church (St. Peter) is now under restoration, and has been for the last twelve months; but although a deal of money has been placed at the disposal of the Vicar of Sheffield for this purpose, we fail to see much progress made, and what has already been done is not of the most satisfactory description. For this work it may be remembered that the late Sir G. Gilbert Scott was the "consulting architect," but the actual restoration fell into the hands of local men, Messrs. Flockton and Gibbs. The principal part of the present work consists of the erection of a small south transept, at a cost of about £4,000. This is now covered in. Within the building the two noble chancel arcades, and the arches under the central tower have been stripped of the plaster and whitewash, under which they have for so long a time been hid. This has been effected with much success, but we learned, with no little surprise, that the architects, deeming the walling stones and those of the piers small, are meditating replastering and repainting them again. Surely such an atrocious thing cannot be really contemplated, or we shall heartily endorse to the old care-taker's remark when giving us this information. "It's a pity, sir, old meister Sir Gilbert Scott is deed; he'd never have allowed such goings on"! The church is to be lengthened 12ft. westward, and the plinths for this are already in. By a curious coincidence, Mr. Thornhill Gell, who gave £10,000 for the interior restorations, died the very day his gift began to be spent upon the removal of the organ. Messrs. Chadwick and Co., of Masborough, are the contractors for the restoration.

In connection with the parish church, the George Wostenholm Memorial Hall is building at the corner of Queen and Silver-streets. Mr. Henry Dent Lomas, of Sheffield, is the architect, and the building will very soon be completed, having been built in a very energetic manner by Mr. J. Fidler, builder, of Eckington. It is of Classical design, the materials used being red and yellow bricks, with stone dressings, and it is a good building in most respects, a wooden top cornice, painted to look like stone, being the only unsatisfactory part about it. The place is a cocoa-house, lecture-hall, reading-room, &c., and will cost between £2,000 and £3,000. The Archbishop of York will open the building in the beginning of December.

New poor-law offices are to be erected upon the site of the Surrey Music Hall in Westbar, an edifice consumed by fire in 1864, and left in ruins ever since. Messrs. Flockton and Gibbs are the architects for the offices in question.

The corner of Norfolk-street and Row is fast becoming the most unique architectural feature in Sheffield. When, 28 years ago, Messrs. Weightman and Hadfield—afterwards Messrs. Hadfield and Goldie, and now Messrs. Hadfield and Son—built the fine church of St. Marie, much town opposition was shown, and buildings were erected at its east end purposely to mar the effect aod stop up the east window. The buildings and the ground as well have, however, in the due course of time become the property of the church, and under Mr. Hadfield extensive additions are being made. Large vestries and other offices have been built, and a presbytery is to be added. These premises run out eastward from the church to the end of the street. Over the door at the corner is a large and well-sculptured representation of the Annunciation in a recessed and canopied panel. The grouping of the works finished, with the church itself, are admirable. Within the church a new chapel has been built, and many good additions made.

By far the greatest work in progress at Sheffield is the new workhouse. This building, or rather block of buildings, is being erected at Fir Vale, Pittsmoor, and covers an expanse of 35 acres. The architect is Mr. James Hall, of Sheffield, and the contract was taken by Mr. J. Garlick, of Saltley Works, Birmingham, the contract price being £134,800, exclusive of boundary walls, heating apparatus, and the various other appointments. The buildings are erected of red and blue bricks, all the bricks being raised and made upon the ground. A deal of excellent stone is also quarried and used upon the spot. The rest of the stone used for dressings, &c., is principally Greenmoor, which latter stone is also used for the landings and steps. The roofs are covered in by Welsh slates. The style of architecture is of a modified Classical character. The central block has a continuous corridor running through it, 645ft. long. On one side of the main portion is a detached block, consisting of a school, dining-hall, and work-rooms; on the other side, another block, intended for an asylum and dining-hall; and in the rear are ten detached hospitals, and a fever-hospital behind them again. The casual wards are away from the workhouse proper, and attached to the lodge. There is a central clock-tower 100ft. high, and the buildings throughout are all three-storied. The contractor is pursuing his labours (which are to be completed next June) with much energy. There are many hundred workmen employed upon the work, and to facilitate the conveyance of material, upwards of a mile of continuous rails are laid down. By a very singular coincidence, the name of the clerk of the works is Mr. James Hall. As stated above, Mr. James Hall is the architect. These gentlemen are no relations, and were strangers to each other, until brought together by the present job.

By these notes, it will be seen that, in spite of the dearth of business generally in Sheffield, many important works in the building trade are in progress. Amongst them we have noticed a large fever-hospital, an immense workhouse, and a couple of cemeteries as nearly ready for opening.

THE SOUTH PASS JETTIES.

ENGINEERS and others interested in the construction of marine works, will find much information of value in Max E. Schmidt's, description of the new South Pass jetties, published in the August number of the *Transactions of the American Society of Civil Engineers.* Mr. Schmidt enters into the practical part of his subject by giving the results of the formation of the South Pass jetties of the Mississippi river and the changes that have taken place in the bed of the channel from May, 1875, to April, 1879. In a former notice we have given a general description of the scheme, and we may now glance at the details of that great work. There is an east and a west jetty; the former is 11,800ft. long, and the latter 7,800ft. long in its main portion. The jetties are 1,000ft. apart, and run parallel to each other. There are besides wing dams which project into the channel from each jetty about 150ft., but these are of a temporary nature. The jetties terminate just beyond the crest of the old bar; they are built of willow mattresses and stone, and are now permanently raised in their main length to the level of average flood-tide. The top of the mattress work is 20ft. wide, and is covered with a layer of stone about 1ft in thickness. A rounded paving of "rip-rap" stone is placed on the mattress work of both jetties for a considerable distance seaward. The stones are specified to be set on edge, and the submerged parts of the slopes to be built of rubble stone, with an inclination of 2 to 1. The mattresses are laid in horizontal layers stayed by piles, and to prevent leakage gravel is worked into them. The ends of both jetties for about 3,000ft. are proposed to be consolidated by large blocks of cement concrete, from 16ft. to 20ft. long, 5ft. to 13ft. wide, and from 2½ft. to 4ft. in thickness, the dimensions enlarging as the jetties approach the sea ends. These blocks are intended to serve as a foundation for a parapet of concrete from 3ft. to 6ft. wide, and from 2½ft. to 4ft. high. The sea slopes at the ends of jetties, for about 600ft., are to have a foundation of a willow mattress 100ft. wide and 2ft. thick, and on this a sloped cribwork of palmetto piles is to be placed and sunk by filling the compartments with large stones of about one ton weight. Pier-heads in the form of a letter T are to be built at the extreme ends of jetties, and at right angles to the axis. We may refer briefly to the mattress-work which composes the main part of the jetties. Flexible willow branches were required 2in. diameter at the butts; they grow abundantly along the banks of the Mississippi above the Passes, and overspread the sub-deltas, and are, therefore, easily obtained and transported. The stone was more difficult to procure, and the ratio of stone to willow in the mattress-work was 1 : 5·32. It is now brought from a limestone region on the Ohio river, and is composed of calcareous and quartzose. These jetties were designed to overcome the abrading power of the river current, the impact of the waves and their undermining power. It was determined, therefore, to construct a broad and elastic foundation to prevent undermining, and to adopt proper slopes to resist the action of the waves, and these conditions have been met as far as possible. The sections given in the author's paper show a large deposit of sand, both on the sea and river sides of the jetties. The author explains that this vast deposit of sedimentary matter was due to the gradual manner in which the jetties were raised, the entire length of the foundation was laid before the second tier was added, and the third layer succeeded to this, and so on. It was noticed that each tier of mattress work caused a shoaling in the sea-side, due to the obstruction placed in the way of each layer of current. The sediment deposited increased as the layers of mattress were added, for the volume of water being confined produced corresponding erosion of the channel. The wing dams at right angles to the jetty have increased this erosion, and a shoaling has taken place from the deposited sediment. An interesting section showing the amount of erosion of the channel-bed created by these works is given in the paper. The bottom, in May, 1875, is shown to be a wide shallow channel, its greatest depth being from 15ft. to 20ft. A twelvemonth later section shows a deep grooving of double the depth near the west jetty, while the bottom in April, 1879, is shown scooped out to an angular groove of over 50ft. deep in the middle. It is believed that 90 per cent. of the willow-work is bedded in the deposits thus formed, though the channel is not fully the width between the jetties. It is affirmed that the main portion of both jetties, or their foundation, is absolutely safe, and that the slopes of the work are protected naturally by mud, sand, and clay deposited by the river. Speaking of the sea ends, the author observes "as soon as the jetties emerge from the shelter of the reefs the degree of exposure increases," and by far the most troublesome parts to maintain have been the lowest 600ft. of the jetties. The subsidence of the bottom, and the compression of the willow work were elements that have been considered, and it was found desirable to increase the lower ends to the standard of strength required. Near the extreme end, sixteen tiers of mattresses have been sunk, representing a depth of about 27ft. of compressed willow work. The depredation of worms is another source of mischief, and the following facts are stated:—"1. No traces of worms have ever been found above a point ten thousand feet below eastern Land's-end. 2. Below that point ravages have been observed, chiefly resulting in honey-combing the lower parts of piles and mattress-binders, and attacking the butt ends of willows. 3. No worm-eating is found to exist on any material from the surface to a depth of 5ft. below." The teredo, it appears, does not penetrate far into the interior of the mattress-courses, especially when they are covered or packed with mud and sand. One of the main objects is to consolidate the lower ends of these jetties; at the upper ends the mud and sand get firmly embedded in the meshes of mattresses, and consolidation is secured. In order to obtain consolidation at the ends, concrete blocks are used weighing from twenty-two to seventy-two tons each.

We pass on to notice the results of these works as tabulated in Max Schmidt's paper. If we compare the figures on the chart given, we find that the depth on South Pass bar has increased from 9 to 27ft.—the result of four years' work. The soundings generally show about 28ft. The deepening of the channel appears to have been progressive. On July, 1879, a navigable channel of 26ft. in depth was obtained at the head of the Pass, showing the work that has been accomplished in less than four years by the scouring action due to the jetties. In emerging from its confinement between these embankments, the channel makes an easterly turn, which has only recently been remarked with the attention it deserves. We recommend all engaged in works of hydraulic nature to study the chart of the South Pass jetties, showing the soundings in feet from the plane of average floodtide. Want of space precludes our entering into the other details given by the author on the preparation of the concrete work, and the mixers used on jetties, illustrations of which are furnished in the paper we have referred to.

TESTS FOR PORTLAND CEMENT.

IN treating of "matrices" Mr. Henry Reid, whose recently-published treatise we have lately noticed, makes some observations upon the characteristics and properties of first-class Portland cement which may be of interest to some of our readers. He observes, first, as regards weight, that it should not be less than 112lb. per straked imperial or Winchester bushel; second, as to strength measured by its tensile capacity of resistance to accurate vertical tension it should not be less than 300lb. per square inch; third, texture or fineness of powder should be as nearly as possible equivalent to 2,500 atoms to a square inch, or, in other words, a sieve of that gauge (fifty square) should not reject more than 10 per cent. of the cement when gently shaken by the hand, and it should feel roughish to the touch; fourth, as regards hydraulicity, it should possess a capacity of resisting the solvent action of water during at least six days' immersion, and when taken out it should not exhibit crack or fracture of any kind; fifth, as to colour, the true colour resembles the best quality of the well-known Portland building stone, namely, a greyish blue or steel grey; sixth, as to setting when mixed neat with a proper quantity of water, it will set in from one to six hours, according to its weight and density; seventh, chemical analysis, a good average cement capable of passing the preceding tests would produce within a moderate divergence of range the following analysis:—

Lime	60·05
Magnesia	1·17
Alumina	10·84
Silica	24·31
Alkalies	1·54

Mr. Reid shows that imperfect blending of the raw ingredients, or insufficient calcination, are often the cause of inferior products. This carbonate of lime, if used in excess, produces a hard and dark clinker difficult to reduce to a powder, and rough to the touch. The lime also becomes hydrated and swells, and endangers the mass. Excess of silica or alumina causes a brown dusting clinker easily ground into a soft powder, but incapable of attaining hardness. The presence of carbonic acid has an injurious tendency. A good Portland cement is intermediate between the over-limed and the over-clayed cement. For the manufacture of concrete, Portland cement is superior to the other two cementing agents, the blue lias and the Roman cement, and Mr. Reid observes where it can be obtained without heavy charges for carriage, it may be regarded as being cheaper than the commonest hydraulic limes.

The author refers to General Gillmore and other American authorities on cement, but the most interesting investigations are those recorded by Mr. Maclay as to the relative effects of different temperatures on the tensile strength of Portland cement. Mr. Maclay refers to a large number of barrels of Portland cement that were guaranteed by the manufacturer to exceed in tensile strength 250lb. per square inch. The cement, when tested, was found to be less than 200lb. per inch. It was found, on inquiry, where the fault in testing lay. "The room where the testing was carried on was heated by a stove, the temperature during the day ranged from 60 to 70°, but at night it sometimes fell below 40°. The gauged cement after immersion in the water was thus subjected to a very low temperature." All the cement was retested, the water in which the briquettes were kept being then maintained at a uniform temperature of 60° day and night. It was found that 1,370 barrels, first tested 185lb. per square inch, when retested gave 317lb. per square inch; that 1373 tested first at 192lb. gave 285lb., and the same number of barrels, first tested 236, gave, on retesting, 289lb. These experiments conclusively point to the fact that temperature has a decided influence, and that when the temperature of the water is raised the tensile strength is increased.

CHIPS.

The Church of St. Nicholas, at Wells-by-the-Sea, Norfolk, which was completely destroyed by lightning in August last, is about to be restored at a cost of about £10,000. Mr. A. W. Blomfield, has just prepared a report describing the cause and effect of the late fire and the necessary and advisable works of restoration.

A new cemetery for Shipham, Norfolk, was consecrated on the 25th ult. The only building on the ground is a building at the entrance, serving as porch and Nonconformist chapel. The parish church will be used for Church of England burial services. The architect is Mr. Nankivelle, and the contractor Mr. Larner, of East Dereham.

On the 1st of October was laid the first stone of an intended chapel at the College at St. Columba, near Dublin. The structure will be 80ft. long and 40ft. high, and when completed will have cost about £6,000. The designs have been furnished by Mr. Butterfield, and the materials will be of the best.

Owing to the alterations to the Architectural Union Company's premises in Conduit-street not being completed, it is more than probable that the opening meeting of the Architectural Association will be held later than usual this year. The date for beginning the Session has not yet been decided upon. The Institute session will not open till December 1st.

The Ipswich Fine Art Club are about to erect premises in High-street, adjoining the new museum and free library for that town.

COMPETITIONS.

Bradford.—We have received the following particulars regarding the Bradford Technical School Competition. The building, for which 16 designs have been sent in, is to be erected at a cost of £12,000, and the successful competitor is to have 5 per cent. upon that amount, with a further remuneration of not more than 1½ per cent. on the quantities. When the conditions of competition were first issued, the charge of 5 per cent. was to cover all, *including* quantities, but owing to strong representations having been made to the council, the fee was reconsidered with the above result. Fifty and twenty-five guineas are offered as second and third premiums. The contour of the site is a trapezium, with right of light upon two frontages only, viz., to Great Horton-road and Carlton-place. When half-way with the plans, competitors were informed that they could set back 15ft. from one of the sides (the S.W.) to gain right of light if required. As the requirements are pretty extensive and varied, the apparent awkwardness of the site has no doubt deterred many architects from competing, else why should there be only 16 competitors, while at Halifax about 40 have competed for a lodge to cost £750? (!) The designs were to have been prepared with Indian ink or sepia, without the introduction of any other colour, and upon white paper, also no framed or perspective drawings were to be allowed. The designs were to show two departments *en suite*—viz., a practical department, with motive power, and one for teaching the theory of the operations. The principal rooms required in the latter were a public lecture-hall to hold 650 persons, with gallery and ante-rooms; a chemical lecture-room for 120 students, with demonstrator's room, &c., attached; class-rooms for teaching weaving, &c., also designing and drawing, and four "extra" class-rooms; museum, library, council-chamber, secretary's office, &c. As a connecting link between the two departments, a lavatory and dyeing-room were to be provided, while in the motive power department, the following rooms were required, viz., power loom weaving-room (area, 2,000 square feet), hand-loom ditto (1,500ft.), spinning, &c., room (750ft.), dressing and twisting room (750ft.), and a workshop (750ft.) Gas was recommended as the motive power. A good feature of the competition was that all inquiries made by competitors were to be in writing, and copies of such, together with the answers, sent to each competing architect. We are informed that we were in error last week in stating that the competition was amongst the Bradford architects. It is an open one. The designs have this week been on view to the council at the Art Gallery, Bradford.

City of London School.—This competition again came before the members of the Court of Common Council for the City at their meeting on Thursday se'nnight. A report was brought up from the school committee recommending that £50 should be awarded to each of the competitors whose designs were marked respectively with the mottoes "L" (Messrs. Oliver and Leeson, Newcastle, illustrated by us September 12th last), "Move" (Messrs. J. and F. Clarkson), and "Palmam qui meruit ferat." The chairman of the committee, in bringing forward the motion, said the plans, which numbered about fifty, were all so good that the committee thought the authors should receive some reward. Two of the members pointed out that this would be establishing an awkward, if not dangerous, precedent, but others, again, urged that it would encourage clever architects to compete for City work. On a division the recommendation was confirmed by 26 votes to 19. Mr. Deputy Fowler gave notice of his intention to propose that £50 be given to each of the competitors.

Hull.—A meeting of the Asylum Committee of the Hull Corporation was held at the Town Hall on Monday. The Town Clerk stated that, agreeably to the committee's resolution adopted at the last meeting, he arranged for an interview between the sub-committee and the Visiting Justices of the Hull Borough Asylum, for the purpose of discussing several points relative to the proposed new asylum. That meeting took place on the 1st of October, and the report he now presented showed that the first point put before the Justices was the purchase of the De la Pole farm for the new establishment, and it was finally agreed to that the Visiting Justices should enter into a contract for the purchase of the farm at the price previously named, and that the purchase should be completed by the 1st of February next. The next point considered was the selection of the plans. The Justices informed the deputation that they had selected six plans from those sent in, and that the estimated cost of carrying out the plans selected, without furniture and fittings, ranged from £44,000 to £56,000. The Visiting Justices had requested the Lunacy Commissioners to examine the plans in question, and report upon them for their guidance, but the Commissioners had declined to consider the plans in any shape until the farm was definitely purchased. The Justices readily granted permission to the committee to examine all the plans, and stated that they would give careful consideration any suggestions that the committee might think fit to send to them. The report also stated that the Local Government Board had intimated to the Town Clerk that they could not comply with the application made by the Town Council for leave to borrow £55,000 for the new premises until the plans had been approved by the Secretary of State. The deputation therefore wished to withdraw the application, and to make a further application for the sum of £13,000, to make the purchase of the De la Pole Farm. The report was adopted, and on the motion of Mr. Elam it was resolved to respectfully request the Visiting Justices to inform the committee of the result of any application to the Lunacy Commissioners for their report upon the six selected plans, so that the committee might have an opportunity of expressing their opinion.

Llanbadoc School Board (Mon.)—On Thursday, the 2nd inst., the above board held their monthly meeting at the old Town Hall, Usk, when the plans submitted in limited competition by Mr. E. A. Lansdowne, architect, Newport, for new schools at Usk and Glascoed, were selected.

Pudsey.—A short time ago the Committee of the Mechanics' Institute, Pudsey, near Leeds, invited architects to submit plans for a new building, and offered prizes for the three best designs. In response to this invitation eighteen sets of plans were received, and after they had been duly considered the first prize was awarded to Messrs. Hope and Jardine, architects, of Bradford, who were accordingly appointed to carry out their plans, and on Monday, the 6th October, the foundation-stone of the new Institute was laid by Mr. Wm. Dibb Scales, of Pudsey, in the presence of a large number of the inhabitants. The new building, which is to be erected at the junction of Low Town-road and Waver Green (two of the principal streets of the town), will be in the Gothic style of architecture, and one of its principal features will be a square tower, having a slated spire, rising to the height of 110ft. The tower is placed at the corner of the two streets just mentioned, and in the base of it, almost level with the street, is the principal entrance, which has a deeply recessed doorway, having a moulded and arched head. The building will contain on the basement floor a large room 43ft. by 24ft., to be used for public tea-parties, with kitchen, scullery, and store room adjoining, and also four class-rooms, lavatory, &c., all of ample size and well lighted. On the ground-floor are a news-room, 34ft. by 24ft.; a library, 24ft. by 16ft.; a conversation or smoke-room, 29ft. by 16ft.; a committee-room, two class-rooms, a lavatory and a secretary's room. On the first floor, which is reached by a stone staircase 5ft. wide, are a public hall 56ft. by 40ft., with ante-rooms adjoining; a ladies' cloak-room; and a science lecture-theatre capable of seating 120 persons. The public hall, which is 32ft. high, has a gallery round three sides, entered from the second-floor level, and will seat 650 persons. On the second floor there are, in addition to the gallery of the public hall, a large room partly lighted from the roof, to be used for the art-classes, and a class-room adjoining. The different works have been let as follows:—Masons' and excavators' work to Mr. James Smith, of Bradford; carpenters' and joiners' work to Messrs. A. and J. Briggs, of Bradford; plumbers' and glaziers' work to Mr. J. Wilcox, of Pudsey; plasterers' work to Mr. Wm. Tattersall, of Bradford; slaters' work to Mr. Jas. Smithies, of Great Horton, near Bradford; and painters' work to Mr. Wm. Sims, of Pudsey. Mr. J. T. Boothman is the clerk of works. The amount allowed to be spent, according to the instructions to competing architects, was £3,000, and the cost of the works as contracted for, including the library fittings and the seats for the public hall, will be within £50 of that amount.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Roman Remains near Maestricht.—A number of workmen, says the *Independance Belge*, are now employed in making excavations on the site of a Belgo-Roman settlement, situated between Bemelen and Heer, near Maestricht. Limburg is richer in underground remains dating from the times of the ancient Romans than any other province of the Netherlands. Vestiges of their civil and military works are met with at every step At Meersen M. Habets exposed to view in 1865 a villa of unusually large dimensions, and uncommonly rich in antiquities. At Ravenbosch, near Fauquemont, the same *savant* brought to light the foundations of an entire Roman colony, comprising 18 houses and a small Pagan temple. The Roman villa at Backersboschdel, which is now in course of excavation, surpasses in size and splendour all that the archæologists have hitherto found. As at Meersen, baths and a magnificent cellar have been laid open; but besides there has been found a great quantity of wrought and unwrought marble; as many as six kinds have been counted. The rooms of this villa are finer and better preserved than elsewhere. The pavement and the wall-plaster are for the most part *in situ*. In the mound the workmen have met with an immense quantity of fragments of tiles, broken pottery, bones, iron, glass, &c. Up to the present time five coins have been found, one of which dates from Domitian's reign, one from Trajan's, and one from that of Septimius Severus. The situation of the villa, which leans against a hill, whence the view commands a wide stretch of country round and the whole valley of the Meuse, is exceedingly picturesque.

SCHOOLS OF ART.

Islington Public School.—The annual prize distribution took place on Monday week. The report stated that the Clothworkers' Company had given 30 guineas for refitting the laboratory. Three Science and Art scholarships of £15 each had been gained by Middleton, Connolly, and Morrison, while E. E. Rutland had won the Clothworkers' Company scholarship. In all, the successes of the year were 22 prizes and 61 certificates in art, and 39 prizes and 122 certificates in science.

Reigate.—The annual meeting in connection with the Science and Art classes was held on Wednesday week. The annual report showed that at the May examinations in art two second-grade prizes and 21 certificates were obtained. In science the students had gained three Queen's prizes for advanced stage building construction, and six Queen's prizes for the elementary stage in the same class, besides five certificates, and prizes and certificates in other classes. The prizes having been distributed, a lecture on the history and objects of the Science and Art Department at South Kensington Museum was delivered by Mr. Buckmaster.

CHIPS.

The work of converting the Edinburgh Theatre into a new hall and offices for the United Presbyterian Church is approaching completion under the superintendence of Mr. John Burnet, architect, of Glasgow. The cost is estimated at fully £20,000.

Mr. James Lewin, who was foreman to Mr. Powell, the contractor, during the recent construction of the Battery Pier at Douglas, has been appointed general superintendent of the harbours of the Isle of Man.

The Lambeth Guardians, on the 1st inst., approved plans prepared by their architect for adding another story to the existing building, with the exception of that portion above the dining-hall.

On Wednesday week Christ Church at Bwlchgwyn, near Minera, was consecrated by the Bishop of St. Asaph. The building was till recently a school-room, but to the original structure a chancel, vestry, and lobby have been added, benches of varnished wood accommodating 140 persons provided, and warming and lighting fittings introduced. Mr. Fry, of Liverpool, was the architect, and Messrs. Phennah and Davies, of Rhostyllen, the contractors for the alterations, which have cost £900.

Building Intelligence.

Broomfield, Kent.—The parish church of Broomfield, Kent, is about to undergo a thorough restoration at the hands of J. G. Naylor, Rochester. The works to nave and tower, which comprise a new vestry and heating-vault, new entrance porch, new roof and parapet to tower, oak seating and new flooring throughout, and general repairs, will be carried out under the superintendence of Mr. G. M. Hills, architect, 4, Adam-street, Adelphi; and at the sole expense of Mrs. P. Wykeham Martin, of Leeds Castle, widow of Mr. P. Wykeham Martin, late M.P. for Rochester, whose remains are deposited in the family vault in this church. The chancel restoration, consisting of new roof, floor, seating, &c., will be carried out under the directions of Mr. Ewan Christian, architect to the Ecclesiastical Commission, and at the expense of that body. The total cost of the works are estimated at about £1,400.

Caversham.—The parish church of St. Peter, Caversham, which has been closed a long time for restoration and enlargement, was reopened on Wednesday week. Before the commencement of the restoration the church consisted of a nave and north aisle (with an arcade of brick and plaster), a chancel and north chantry, with a wooden tower and gallery at the west end. Originally the church had no tower, but only a bell gable, traces of which existed when the recent works were commenced; remains of an early arcade were found, showing that a north aisle formed part of the original church which existed in the Norman period. The new works consist of building the new south aisle, and rebuilding the tower, nave, and porch, which have been erected in the Early English style. The contractors, Messrs. Wheeler Bros., of Reading, and Mr. A. W. Dodd, of Caversham, have performed their work under the guidance of the architects, Messrs. Morris and Stallwood, of Reading, whose design we illustrated two years since. The works have cost about £3,500.

Edinburgh.—Lady Glenorchy's parish church, Roxburgh-place, Edinburgh, has recently undergone renovation, after designs by Messrs. Stewart and Menzies. At present the church has no architectural pretensions externally; but it is intended to raise the front wall, and finish it with a cornice surmounted by a balustrade, with pedestals and vases intervening, and to introduce pilasters with entablatures round the door and window openings. Internally the church is oval-shaped, with a coved and plastered ceiling and centre cupola. Inclusive of gallery, the church is now seated for about 840 persons, and the renovations include the renewing of the flooring in the area, the improving of the entrance lobbies, and providing a new vestry and other conveniences at the north entrance. The coved ceiling has been effectively broken up by means of painted panels and ornamental scroll bands; while the windows have been filled in with enamelled glass, and new gasfittings introduced throughout.

Elland.—On Saturday week the foundation-stone of a new Primitive Methodist chapel was laid in Frances-street, Elland. The chapel will be a modification of the Gothic style, and the external dimensions will be 66ft. by 48ft. The walls will be constructed in pitch-faced masonry from the Southowram quarries, with tooled ashlar quoins. The windows will be of two and three lights, with traceried heads. The seating is of open benches, and all the area level, providing accommodation for 400 persons. These benches, the rostrum, the roof, and other woodwork, are all of pitch-pine. The total outlay will be about £2,000. Mr. Thomas Firth, of Elland, is the architect, and the contractors are:—Mason's work, Messrs. James Whiteley, Elland; joiner's work, Joseph Wilson, Elland; slating and plastering, Thomas Wadsworth, Greetland; and plumbing, Joseph Aspinall, Elland.

Finchley, N.—A new Baptist chapel at North Finchley was opened on Tuesday week. It is Early French Gothic in style, and is faced with Kentish ragstone with Bath dressings. The front next the main road has a large five-light traceried window in the gable, and under it is a projecting porch leading to the principal entrance. Flanking the gable are towers of unequal heights, in which will be placed the staircases to future galleries. The side fronts of the building are broken by small transepts, by gablets over the windows, and by a crocketed flèche in centre of roof, forming a ventilating shaft, and rising 80ft. above ground-level. Internally, the chapel measures 60ft. by 40ft., and 42ft. in height to apex of vaulting. It is pewed for 400 persons, but by chairs in the side aisles, an additional 150 can be seated. The roof is vaulted and groined in wood, the ribs springing from colonettes of red Mansfield stone set on the walls; the dados are coloured, the windows furnished with ruby borders, and the chapel is well cushioned and carpeted. At the rear are four well-furnished vestries, over which is placed a school and lecture-room seated for 200. The work has been carried out by Messrs. Staines and Son, of Great Eastern-street, E.C., under the supervision of Mr. Morton C. Glover, the architect, at a cost of about £4,000.

Forfar.—The memorial stone of St. John's Episcopal Church was laid on the 6th inst., by Mr. William Gilbert Don, manufacturer, Forfar and Dundee. During the pulling down of the old church, the workmen found the old memorial, which was carefully preserved and placed in the memorial stone of the new church, now in course of erection, beneath the new memorial. The new church is being built according to drawings prepared by Mr. Robert Anderson, F.R.S.A., 6, Wemyss-place, Edinburgh. Mr. James Scott, builder, Castle-street, Broughty Ferry, has a contract for the whole work. Mr. Wm. Bruce is the clerk of the works.

Great Salkeld Church, Cumberland.—The restoration of this interesting old Border church has been completed, and services in commemoration of the event have just been held by the Lord Bishop of the Diocese. The chief features of the restoration are as follows:—A chancel arch has been inserted, and the wall above carried up in lieu of the lath-and-plaster partition, the only protection of the east end of nave from the weather, where it rose above the chancel roof. The very unsightly and shapeless windows on the south side of the nave, inserted some 70 or 80 years ago, have been removed, and new windows inserted in their place; in preparing for which, remains of the original windows, of two different dates, were discovered walled up; the traces thus found have determined almost entirely the form of the present windows, the inner jambs of some of which are the original openings. The flat plaster ceiling of nave, which was unsafe, has been removed, and the old massive oak roof of 12th Century date has been cleaned, repaired, and thrown open to the church. The old tower, which is of great interest, being perhaps the finest of the towers of the border fortress churches of Cumberland, which were used as strongholds and places of refuge in times of border warfare, has had the roof restored; the upper part now used as a ringing loft has been refloored, the lower floor now used as vestry, cleaned and repaired, and the vaulted dungeon beneath has been floored and converted into a chamber for the hot-water heating apparatus. The old pews, which were of oak, have been removed, and the material reframed to form comfortable open seats. In the alterations made some 80 years ago, some old and carved oak framing had been formed into a very inconvenient and unsightly gallery across the west end of nave, which has now been removed, and the old oak work formed into a very satisfactory reredos. The pulpit has been replaced by a new stone one, the gift of the architects. The restoration has been intrusted to the care of Messrs. Hetherington and Oliver, architects, Carlisle.

Hull.—Queen Anne-buildings, Hull, are now being erected in Carr-lane, and form an important part of the Carr-lane improvements. They stand upon land formerly occupied by a group of old-fashioned buildings which for some time had been a disgrace to the situation. The materials used in the new buildings are red brick, with Ancaster stone dressings, the ornamental portions being in red terra-cotta and carved brickwork. The roofs are covered with red tiles. Mr. W. Wellsted, of Ocean-place, Hull, is the architect, and Mr. G. Jackson, of Witham, is the contractor for the entire work.

Leckhampton.—The foundation stone of the new church of SS. Philip and James, Leckhampton, was laid on Monday week. It replaces on the same site a small church overladen with galleries, erected in 1844, in what was then considered Early English Gothic, from the designs of the late Mr. Shellard. The present section of scheme for rebuilding only comprises a new chancel, 40ft. long by 24ft. wide, and north and south transepts each 23ft. by 22ft. The materials are Bath weathered stone for the external dressed stonework, Leckhampton stone for the rough walling, and Painswick stone for the internal ashlar work. The shafts to the richly moulded chancel arch and internal faces of windows will be of marble. In the arcades to transepts and shafts to external faces of windows red Mansfield will be used. The chancel will be covered in with wooden groined panelling and the transepts by plain panelling, also in wood with moulded ribs. On the south side of chancel rich triple sedilia and a credence will be erected. The architects for the new building are Messrs. Middleton and Son, and the contractor for the first part of the work is Mr. W. Jones, of Gloucester.

Liverpool.—A new English Presbyterian Church was opened on the 5th inst., at Sefton Park, Liverpoool. Designs in a limited competition were invited some time since, and from those submitted by thirteen architects the committee, acting under the advice of Mr. E. G. Paley, architect, of Lancaster, unanimously selected the design of Mr. David Walker, of Liverpool. The style is 13th century Gothic, and the plan cruciform. The nave and transepts are devoted to the worshippers, and the portion commonly used as the chancel is arranged as a lecture-hall, to seat about 250, and with the minister's and clergy vestry grouped on either side of it. The nave, which is covered with a partly groined and in part polygonally panelled roof of pitch-pine, is in one clear span of 47ft. 6in., with a total height of 62ft., and a height of 51ft. from floor to ceiling. The nave and transepts will accommodate 790 worshippers. The south windows have been executed by Messrs. Shrigley and Hunt, of Lancaster. The whole of the seat rugs, hassocks, and vestry furniture, carpets, &c., have been specially designed to accord with the character of the edifice, and were supplied by Messrs. Jones and Willis, of London and Birmingham. The exterior of the church is built of Yorkshire stone shoddies, with Storeton stone dressings of a warm tone. The tower with spire, rising to the height of 167ft. to the top of the vane, is broken into three stages, with double traceried lights at the bell stage, above which rises the broach spire, with angle pinnacles at the junction of the broach with the spire, and deeply-recessed louvred lights intersecting the several faces. The general contractors for the work were Messrs. Thornton, and Son, of Liverpool. The entire works have been executed throughout, from the designs of Mr. David Walker, and the total cost will be about £15,000; Mr. William Bell having acted as clerk of the works.

Metropolitan Board of Works.—At the meeting of this Board on Friday a report was received from a committee stating the result of the proceedings taken by Mr. Robert Walker, district surveyor, before the magistrate at Marlborough-street, to obtain the removal of the party-wall between Nos. 28 and 29, Haymarket, as a dangerous structure. The action taken by the superintending architect in instructing the contractors as a matter of emergency to take down the wall was approved, as was also that of the solicitor in instructing counsel to assist Mr. Walker. New by-laws under the 16th section of the Metropolis Building Act Amendment Acts, 1878, were submitted as amended in accordance with the wish of the Home Secretary, and were ordered to be sealed and re-submitted to Mr. Cross for confirmation. Some discussion took place with respect to the question of the non-removal of a temporary iron church in Bromley-road, near St. Mildred's-terrace, Lee, on the expiration of the period allowed by the Board for its retention; ultimately by a large majority the Board decided to carry out its by-laws, and instructed their solicitor to take such steps as he might deem advisable, and similar action was ordered to be taken with regard to another temporary iron church, in Tracey Street, Lambeth. A request from the Under-Treasurer of the Middle Temple for permission for the Benchers of the Inner and Middle Temples to construct a carriage-way and foot-way as an approach from the new buildings erected in their gardens to the Victoria Embankment, was referred to the works committee.

Newtown. -New business premises have just been opened at Newtown, Montgomeryshire, for Mr. Pryce Jones. The architect is Mr. David Walker, of Liverpool. The style is Italian, and the cost £13,000. The external walls are of brick of a deep red hue, made at the Garth Ruabon Works and the Vron Brickyard, Newtown, while the ornamental parts are of polished Minera stone and Shap granite. An elegant feature of the building is the portico of the principal entrance. Granite columns support a heavy entablature on the piers. On either side of the former are carved the arms of England, Scotland, Ireland, and Wales, and the pediment contains a group of figures illustrating "Commerce and Industry," executed by Mr. Rogerson, of Liverpool. Mr. E. Williams, of Newton, was contractor for the works.

Ramsbottom.—On the 29th ult., Dr. Vaughan, the Roman Catholic Bishop of Salford, laid the first stone of St. Joseph's Church, Ramsbottom, which when completed will consist of nave, north and south aisles, chancel, and sacristies, with tower and spire at the south-west corner facing the Bolton-road. The nave will be 70ft. by 23ft., and 42ft. high to the ridge of the vaulted roof, the aisles 11ft. 6in. wide, and the chancel 26ft. by 21ft., and 38ft. to the ridge of the vaulted roof. The style is Gothic of Early Geometric character. At present only the nave and aisles are being erected, at a cost of about £2,500, the contracts being in the hands of local men, and under the superintendence of Mr. C. W. Whittenbury, of the firm of Bird and Whittenbury, architects, Manchester.

Raskelfe.—Raskelfe Church within the past few months has been thoroughly rebuilt at a cost of between £2,000 and £3,000. The church, previous to the present rebuilding, consisted of a nave, chancel, and north aisle, and a peculiar tower of wood. Some years ago a gallery existed at the western end of the old building, to erect which the west window had been blocked up. On the north side of the chancel there existed an ancient oak arcade of two arches. This arcade, in the rebuilding of the church, has been retained, and forms a beautiful specimen of old work in the chancel. The great feature of the church previous to its rebuilding was the large wooden tower, which had a flat roof. This has been rebuilt of wood, and the cone has been protected with tiles, surmounted with a large weathercock. On scraping the walls of the chancel a large quantity of stucco work was discovered, and at the south-east corner a beautiful female figure, executed in various colours. None of this work, however, has been preserved, a great portion having been destroyed in the scraping of the walls. In its restored state a new south aisle has been added to the building, which has greatly increased the interior accommodation. The Lady chapel at the north-east corner has been rebuilt on the foundation of the old edifice, and the wooden arcade leading to it from the chancel repaired. Two new windows have been placed in the north-east aisle, two in the Lady chapel, and one at the eastern end of the new south aisle. On the west side there are two new windows, one at the end of the north and the other in the south aisle. As much of the old oak as could be used has been put into the stalls of the new building, and the old altar rails have been again erected. During the rebuilding a number of old Roman coins were found. The architect is Mr. Christian, of London, and the contractor, Mr. Brown, of York.

Southport.—A new church and schools in connection with the United Methodist Free Churches have been opened during the last month. The buildings stand upon freehold land at the corner of Duke-street and King-street. The style is freely treated Italian, and the walls are built of best Burnley parpoints and Cefn ashlar dressings, backed with common brickwork. The inside woodwork is of pitch pine twice varnished The church will seat 750 adults and the school will accommodate 200 scholars. The whole of the works have been executed by Mr. James Cheetham, builder, Southport, at a cost of £6,200, which sum includes boundary walling, heating apparatus, gas fittings, &c., complete. The buildings are erected from the designs and under the superintendence of Messrs. Maxwell, Tuke and Hurst, architects, Southport.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J, Passmore Edwards.

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Received.—F. I. Co.—H. and G. S. and Co.—S. and S. —L. G.—J. W.—W. R.—A. L.—A. and S.—B. L. Co. —J. and E. G.—G. S. G. Co.—R. C. S.—S. Bros.—J. and E. H.—S. and Co.—G. C.—A. S.—S. and S.—B. of D.—M. T.

Correspondence.

THE HULLBOROUGH LUNATIC-ASYLUM COMPETITION.

To the Editor of the Building News.

Sir,—I inclose you a paragraph, cut from the *Eastern Morning News* of the 2nd October, in reference to the competition for the New Borough Asylum. Comment on the fact that six *local* competitors have been selected out of 26 is unnecessary.

Justices' justice has evidently not improved since Shakespeare's time.

One of the Twenty from a Distance.

The New Asylum for Hull.—The deputation appointed by the Hull Asylum Committee to confer with the magistrates upon the subject of the new borough asylum, met a body of those gentlemen at the Town Hall yesterday. Six plans for the new building supplied by *local* architects were selected, the various estimates of which ranged from £44,000 to £56,000. It was resolved to ask the Lunacy Commissioners to send an architect to Hull to select one, two, or three of the plans submitted, and to report thereon. It was arranged that, subject to the approval of the Corporation, £13,000 should be ready in four months' time for the purpose of purchasing land for the new asylum, whereupon the Commissioners might select the specific plan to be adopted. It was resolved to sell a portion of the land available at the old asylum at once, so that the proceeds might be devoted to the improvement of Asylum-lane, which, when effected, will greatly enhance the value of the property remaining.

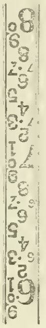
SILICATED STONE.

Sir,—In your very able account of the various processes seen at my works by the Society of Engineers on the occasion of their recent visit, I notice one error of some importance, which you will doubtless kindly allow me to correct. It is stated that the various stones manufactured by us under Mr. F. Ransome's patents are less hard internally than on the surface. This is not the case; the greatest merit possessed by the "Ransome Stone" being its absolute homogeneity, and there is absolutely no difference in hardness between the centre of a block 2ft. thick and the surface of the same. Were this not the case the material would be inapplicable for grindstones, whereas a large number are annually manufactured and are in constant use. The emery-wheels made by the apœnite process are also equally hard throughout, and in this respect the Ransome stone differs from the other silicate processes, such as Victoria stone, silicated stone, &c., which are much harder on the surface than internally. The purposes, however, to which they are chiefly applied cause this to be no detriment whatever, and each sort of manufactured stone has its legitimate and appropriate field.

Will you allow me to take this opportunity to state that our various processes are no secret, and the works are freely open to visitors, whether with a commercial or purely scientific object, at any time, Tuesdays or Thursdays preferably.—I am, &c.,

A. H. Bateman.

A DISTINCT LEVELLING STAFF.



Sir,—Seeing the ingenious and evidently very useful description of subterranean levelling-staff in your paper of the 3rd inst., I send you, as a practical expression of my thanks to Mr. George J. Gee, a suggestion for an improved mode of marking the staff, which would probably prove even more useful below ground than in the full light of day.

The drawing I send you is almost exactly the system invented and used for many years by the late Mr. T. Carrick, of Manchester; its principle being that each numeral is formed with five well-defined equal divisions in its height, and occupies in total height one decimal division of a foot. By this means four great desiderata are attained:—

1st. The figures are of the largest possible size.

2nd. The largest area of white surface is retained.

3rd. The usual dazzling horizontal lines are avoided, and very clear marks provided in their stead.

4th. Each decimal-point is figured, and the foot figures twice repeated, so as to read at short or obscured sights.—I am, &c.,

Manchester, Oct. 6. J. Corbett.

CHIPS.

A "steeple-Jack," named Tom Massingham, of Newcastle, visited Yarmouth last week, and ascended the spire of St. Nicholas' parish church, and removed for gilding the weathercock, an ornament which proves to be 141 years old. The spire itself is 168ft. high, and was erected, at a cost of £1,890, in 1803, in place of an older and more graceful structure, which had become insecure. It is covered with tinned sheet copper, and has of late years been painted with remarkable effect.

The Wesleyan chapel and schools at Newton-lane-end, Wakefield, are being enlarged from the designs of Mr. Watson, architect, of that town.

The town council of Colchester, at their meeting on Wednesday week, considered a report and plans as to proposed extension of the town hall and erection adjacent thereto of municipal offices, with shops beneath, prepared by Mr. C. Clegg, assistant surveyor. The additions are proposed to be carried out in similar style to the existing building, which is of an unpretending Classic character in white brick, with stone dressings, and the estimated cost is £8,000. The council decided to submit the scheme to the public for consideration.

The memorial-stone of the new church of St. Matthew, now in course of erection, in Panmure-road, Sydenham, was laid by Earl Dartmouth on Tuesday week. The church is being built from the designs of Mr. J. E. K. Cutts, of the Strand, W.C., and was illustrated in the Building News, September 27th, 1878. The present contract has been taken by Messrs. Lathey Brothers, of Battersea, at £2,770, and consists of the chancel and part of the nave, seating 300 persons. The complete scheme is for the accommodation of double the number, and will cost about £5,500 in execution.

The new church of St. Mildred, Lee, Kent, was consecrated on Tuesday week. It is situated nearly on the top of Burnt Ash-hill, and is a conspicuous object for miles. Sittings are provided for 800 persons. There are four stained-glass windows, executed by Messrs. Heaton, Butler, and Bayne; the three bells are by Messrs. Warner and Co., the organ by Messrs. Bevington and Sons, Soho, and Messrs. Hard, Son, and Peard supplied the gasfittings. The total cost has been £6,000, and it is proposed at a future time to add a tower at an estimated additional outlay of £1,000. The architect is Mr. H. Elliott.

The strike of engineers in London came to an end on Saturday.

Intercommunication.

QUESTIONS.

[5911.]—**Leicestershire.**—I shall feel obliged to any reader who can inform me whether architectural illustrations, such as plans, elevations, &c., have ever been published of Ulverstoke or Ulverscroft Priory, in the above county, and where.—B. J. W.

[5912.]—**Fonts.**—Can any of your correspondents explain the meaning of the hieroglyphics on the fonts of Winchester Cathedral and St. Bride's Church, Cumberland?—Htims.

[5913.]—**Water Freezing.**—A water main, 9in. internal diameter, supplies a town of 8,000 inhabitants. Would there be any danger of the water freezing if the pipe were exposed to the air in crossing a cutting about 8 yards wide? If there were danger, what would be the cheapest and best way of protecting the pipe?—T. C.

[5914.]—**Licence for Valuing Dilapidations.**—Do I require a £2 2s. licence to value dilapidations or arbitrate on value of work done, even if the matter be brought before the court? I have consulted the supervisors of excise, but find their book of instructions on the subject only refers to appraisers (which I contend I am not), and anything liable to stamp-duty. The experience of those under similar circumstances will oblige—Manx.

[5915.]—**Greenstead Church.**—In looking over a volume of the "Saturday Magazine" for 1832, I find an account of Greenstead church, Essex, which, if the description is correct, is certainly a unique structure, at least as far as this country is concerned. It is described as consisting of a nave "composed of the half-trunks of oaks, about a foot and a half in diameter, split through the centre and roughly hewn at each end to let them into the sill at bottom and into a plank at the top, where they are fastened by means of wooden pegs. The north wall is formed of these half-oaks set side by side as closely as their irregular edges will permit. In the south wall there is an interval left for the entrance. The ends were formerly similar, but the one has been removed and the church enlarged in the addition of a brick chancel, and although the other remains it is hidden by having a wooden belfry attached." This account also says that it was built as "a sort of shrine for the reception of the corpse of St. Edmund on its return from London to Bury St. Edmund's," thus making it 933 years old. Perhaps some of your readers may know the church (if still in existence) and be able to give some information about it.—W. H. W

[5916.]—**Levels of Sewer Invert.**—I should be glad if "G. H. G." or any of your readers could give me any information as to the various and best methods of giving the exact level of a sewer invert to the contractor on the ground. For instance, a sewer 500ft. in length is to be laid at a gradient of 1 in 272; which is the correct way of giving the level of the invert? My reason for asking this simple question is because a friend of mine contends that my method is incorrect, and I wish to hear the opinion of persons better informed.—H. T.

[5917.]—**Surveyors' Charges.**—I shall be glad if you will allow me to inquire, through your "Intercommunication" column, what are the usual charges made for surveying and laying out an estate in building lots, superintending the formation of roads and drains, negotiating the sale, and furnishing tracings of the respective plots. I find the R. I. B. A. scale does not help me in arriving at the usual charge made for such services, so that I shall thank any of your readers who will assist me in the matter.—F. R. I. B. A.

REPLIES.

[5871.]—**Finial.**—This question remaining unanswered, I beg to offer my opinion. The responsibility of the builder in the matter in dispute would he simply as to the fixing of the vane, not in any defect of design or in the vane itself, which ought to have been discovered in selecting the pattern, or be made good by the manufacturer himself if, for instance, the workmanship was found on delivery to be defective. If the selection of the finial be in fault then the responsibility would fall upon those who ordered it. What the defect is is not stated; but it seems that though the defect at the end of rod fitting into a cup was afterwards pointed out to the builder by the clergyman, there is still the responsibility of having selected a design in which a faulty connection existed. Of course, legally, only the architect could interfere and object. The builder appears, however, to have been precipitate.—G. H. G.

[5900.]—**Drain.**—The drain pipes referred to by "Enquirer" ought to have been puddled round in clay. The turf or moss will keep the pipes in place for a short time, but there is every probability of a recurrence of further breakage of pipes.—G. H. G.

[5902.]—**Formulæ.**—I shall advise "R. W. P." to get a treatise by Campin on "Bridges and Girders" in Lockwood's series, where he will find many useful formulæ worked out arithmetically.—G. H. G.

[5003.]—**Measuring Slating.**—There is apparently something wrong in the question of "Port Madoc," as his figures do not agree with diagram. It is usual to allow 6in. for all eaves, also for cuttings to hips.—G.

[5003.]—**Measuring Slating.**—In reply to "Port Madoc," I have found the following to be the usual custom both in the north and midland counties:—Measure net size of roofs, allow full lengths of eaves by 12in. (for the double course), allow full lengths of hips and valleys by 12in. (for the waste cutting), deduct openings for skylights when above one super yard in size, in which case you allow the width of skylight by 12in. for the double course above same, which is really another eave. There is no allowance made for gables, except they are on the skew, when an allowance of 6in. by the length of slope (on skew) should be made. I never heard of an allowance for ridges, nor can I think of any possible plea for such allowance. The above method of measuring only applies to Welsh slates. Westmoreland slates being usually larger, there are special allowances according to the size used.—H. G. Badenoch.

[5907.]—**Damp in Houses**.—The best way of preventing condensation is to well ventilate. The floors, especially the basement, should be protected from the rising of dampness by a layer of asphalte. The upper floors should be also ventilated. Battened or hollow walls should be adopted.—G. H. G.

[5907.]—**Damp.**—The question of damp is a very serious one, which has received but little scientific consideration. Medical men do not in the least know why they tell us to avoid damp. But considering that about two-thirds of the human frame consists of water, it is not easy to conceive how a few ounces more or less which might be daily inhaled into the lungs or otherwise communicated to the system could have any serious consequence. My experience agrees with that of your correspondent in No. 5907. So long as the body is not abnormally reduced in temperature damp appears to me to do no harm. The secret is, in case of a damp house or damp clothes or cold damp weather, keep comfortably warm. Like your correspondent, I am not naturally very robust in health, but I sleep with my windows open at night in all weathers, and have never suffered from doing so.—P. D.

CHIPS.

The foundation-stone of a new Methodist chapel at Chesterton was laid last week. Mr. E. Harrison, of Hanley, gratuitously prepared the plans, and the Rose Vale Brick and Tile Company have contracted to erect the chapel, which will be a plain brick building, 45ft. 6in. long by 25ft. wide, with vestries and other accommodation for 300 worshippers. The cost will exceed £400.

The foundation-stone of new Congregational schools at Bromley, Kent, was laid on Monday week. They will provide accommodation for 400 children, at a cost of £2,000. The architect is Mr. John Sulman, of Furnival's Inn, and the builders are Messrs. J. and C. Bowyer, of Upper Norwood. The buildings in course of erection comprise a central hall surrounded by 15 class-rooms, lecture-hall, a library, infants' class-room, and vestry. A new chapel forms a portion of the scheme, the total cost of which will be £12,000.

The Edinburgh Music Hall has been redecorated by Messrs. Bonnar and Carfrae, of Edinburgh.

On Monday the first school erected by the Thurlstone School Board was opened. It is built of local stone, in the Early Pointed style. Messrs. Senior and Miller, of Barnsley, were the architects. The estimated cost was—School buildings, £1,600; master's house, £450; land, £156; making a total amount of £2,000.

The new schools on the east side of Whitby, which have been erected by the Whitby School Board, were opened on Friday, a public meeting being held in the girls' school to mark the event. The new buildings, which, including the site, &c., have cost nearly £2,600, are constructed of brick, faced with stone. The architects are Messrs. Armfield and Bottomley, of Whitby and Middlesborough, and the contractor for the works is Mr. James Gladstone, of Whitby.

At a meeting of the newly-formed burial board of Kirkley-by-Lowestoft, held on Wednesday week, the approval of the Secretary of State was received for the site, consisting of four acres of ground. Mr. J. L. Clemence, of Lowestoft, architect to the board, submitted plans for laying out the ground and for the necessary buildings. The chapels for the Church of England and the Nonconformists are intended to be precisely similar; they will be built of rough flints with stone dressings, and the inside faced with red, white, and black bricks in patterns. The coffin aisle or mortuary chamber is separated from the chapel by a glazed screen for sanitary purposes, and is placed convenient to the road adjoining. The lodge is to be built of flints with stone dressings, and the upper part of timber frame-work, filled in with concrete. The retiring rooms for ladies and gentlemen, and also robing rooms for the clergy, are placed at the entrance to grounds, and not at the chapels, the usual arrangement.

A meeting of Norfolk landowners and county residents was held at Norwich, on Saturday, to consider the desirability of promoting a line of railway connecting Reepham and Holt with Norfolk. The plans, prepared by Mr. Smith, C.E., showing a line 25 miles in length, and connected by a branch from Burgh-hall with Fakenham, were provisionally approved, and a committee was appointed to take steps for bringing the scheme before Parliament.

New waterworks for the town of Cardigan, constructed from the plans, and under the superintendence of Mr. A. Szlumper, C.E., were formally opened last week.

The new Ambrose Memorial Congregational chapel at Port Madoc has been opened for services. It measures 70ft. by 48ft. within the walls.

The foundation-stone of a new church was laid at Gunnislake, in the parish of Calstock, Cornwall, was laid on Monday week. The church, which will be dedicated to St. Anne, will be Early English in style, will seat 300 persons, and will cost about £2,000.

WATER SUPPLY AND SANITARY MATTERS.

Duffield.—The Local Government Board have consented to the formation of Duffield into a special drainage district by the Belper rural sanitary authority. The area of the proposed district comprises about 500 acres. The sewage is to be disposed of by irrigation on 10 acres of land belonging to Lord Scarsdale, and the cost of the scheme is estimated at £3,000. Mr. Geo. Thompson, of Derby, is the engineer.

Sheffield.—An investigation is now proceeding in Sheffield relative to the pollution of the water in the distributing reservoirs in the town, and the attention of the Local Government Board has been called to the matter, which is of the greatest importance to all large towns, where, owing to a defective system of drainage, there is danger of the water-supply becoming polluted. Originally there were large surplus lands around the distributing reservoirs in Crookesmoor Valley, but Sheffield has grown to such an extent within recent years that the land has now been built upon, and the sewers from these houses run near the reservoirs. According to the medical officer of health, some of the sewage pipes have fractured, and an analysis of water taken out of one of the slopes near the reservoirs proved that it was largely permeated with sewage. The water company contend that the water in the reservoirs cannot be polluted, as they contain quantities of fine fish; but the correspondence has been sent to the Local Government Board, drawing their attention to the grave cause of peril to the public health by the threatened pollution of reservoirs from sewers in proximity to these waters.

LEGAL INTELLIGENCE.

A Building Dispute.—In the Chancery Division of the High Court of Justice on Wednesday week, before Mr. Justice Bowen, vacation judge, the case of Vine *v.* Raleigh was heard. This was an application to the Court to consider the specification and tenders for repairs of farms at Monk, Hoe, Plymouth. Mr. Bagshawe, Q.C., appeared for the applicant. It was objected that the question adjourned into Court being which of three tenders should be accepted, the application now was, Who ought to be appointed superintendent to do the repairs? There had been great dissatisfaction expressed with the way in which the works so far had been executed. It was also submitted that a local man, Mr. Oldreive, of Totnes, should be superintendent, and not a Londoner, whose expenses of going down to the locality would be heavy. His lordship ordered the repairs, the cost of which would be £800, to be made at once.

Building Disclosures Extraordinary.—At Edmonton County-court last Friday, the action of Brooking v. Brown was tried. Plaintiff is a painter and general contractor, carrying on business at Stamford-hill, and defendant is a master builder of 10, St. Ann's-road, Tottenham. The claim was for £15 12s. 3d., balance of account for goods supplied and work done under agreement. Plaintiff stated that in January last defendant was building some seven-room houses in Tewkesbury-road, Tottenham, and witness agreed to paint, grain, varnish, whiten, and paper five of them throughout at £6 10s. each. The houses were then in carcase, and he told defendant that he should expect them completed, as far as bricklayers, carpenters, &c., were concerned, and the rubbish cleared out, before he commenced. Defendant, however, urged him to begin in March, although the doors were not all in, the mantelshelves and stoves were not fixed, and the plastering was incomplete. Plaintiff represented that the work would be spoiled by dust, damp, and dirt, and that it could not be properly done; but defendant said he might go on, alleging that he was "hard up," and that the surveyor would not advance any more money till the work was finished. Although the water was running down the walls when the paper was to be put up, defendant insisted on having it done. Under the circumstances it was impossible to make a clean job of it, but plaintiff did all in his power. No complaint was made respecting the work till legal proceedings had been commenced for the recovery of the balance of money due. In cross-examination plaintiff admitted he was a grocer as well as painter and general contractor, but said his wife attended to the shop and that he had had 20 years' experience in painting, whitewashing, and papering. Francis Brooking, plaintiff's son; Walter Brazier, painter; Henry Chillingsworth, grainer; Henry Rawlingson, carpenter; and Henry Bound, master plasterer, were called in support of plaintiff's case.—The defence was that the work was done so badly that it was scarcely of any use; that it was scamped throughout, and that it would have to be done over again before the houses would sell or respectable tenants occupy them. The alleged hurrying on, regardless of consequences, was denied. [Samples of the work, chiefly doors, were produced in court.] — Charles Kirkby, architect and surveyor, Great James-street, Bedford-row, deposed that the work had been very badly executed, and that for such a job £5 per house would be sufficient remuneration—£6 10s. per house was a low figure. Painting could very well go on while carpenters and plasterers were at work; all that was needed was to damp the dust. James Underwood, Markfield-road, Page-green, decorator, said he had done a lot of "speculative" work, but never such as he had seen in defendant's houses. He should be ashamed of it. By the Judge: Wouldn't undertake to do the work at £6 10s. per house; but if Mr. Brooking fixed too low a figure, he ought still to do the work properly. Alfred Hurley, 6, St. Ann's-road, plumber and painter, considered the work shamefully done. His Honour said he considered the plaintiff entitled to the amount he had claimed. The work was done at a very bad time of the year, in damp and wet weather, which appeared to him to be a drawback, although from what had been advanced by one witness, it would almost seem that the worse the condition of the structure the better for the tenants; but the statement that paper could with propriety be put on wet walls did not commend itself to him. Judgment for plaintiff, with costs.

Irregularities under the Building Act.—Worship-street Police-court, 7th October, 1879, before Mr. Bushby.—District Surveyor for East Hackney (North) *v.* Willmott.—It was stated that the defendant had executed certain works in alterations and additions to Upton House, for its conversion to a Truant School for the School Board for London, and the present summons was in respect of alleged irregularities under the Metropolitan Building Act. The district surveyor contended that this was, under sec. 3, a public building at the date the works were executed, and either that the whole of the staircases and walls should be made to conform to the requirements of secs. 22 and 30, or if sec. 9 shut out this contention, then that the principal staircase, which had been altered, should be made in conformity with sec. 22 to the extent of the alteration. The magistrate held that, although in some senses this might be considered in its present use a public building, yet it was built for and was occupied as a private dwelling-house up to the time of its being required by the Board. He considered it still bore that character, and did not become, by reason of the change of occupation, a public building contemplated by the Act. The Act seemed to him to mean by "public building" a building erected *de novo* for a public purpose. Summons dismissed. Case granted.

Omitting to Give Notice of Intention to Build.—A case of some interest to suburban builders was decided at Edmonton sessions on Monday. Messrs. Hensby and Hensby, builders, of North-hill, Highgate, were summoned by the Tottenham local board for having broken one of their by-laws by failing to give notice of their intention to build a house in Mayer-road, Wood Green. The case was fully proved by Mr. De Pape, surveyor, and Mr. Studd, building inspector, and defendants were fined 20s., a continuing penalty of 5s. per day for fourteen days, and 10s. 6d. costs, altogether £5 0s. 6d.

Prosecution of a Town Contractor.—At Ramsgate Petty Sessions, on Wednesday week, the contractor for town refuse, Charles Home, was summoned by the sanitary committee of the local board for allowing Edgar's-field, in which the rubbish and refuse is deposited, to become a nuisance, and injurious to health, and for not complying with an order to abate the same. Mr. May, inspector of nuisances, proved that there were huge quantities of decomposing house refuse and other deposits within 100 yards of 85 inhabited houses, and that the stench arising from these heaps was great. The chairman of the local board and other witnesses proved that the nuisance was a great and increasing one. For the defence, it was stated that the contractor had found it impossible to get rid of the refuse. The magistrates, after visiting the site, decided to issue an order that no further deposits be made in the field, the largest accumulation to be covered with 3in. of mould to the satisfaction of the town surveyor, and to be removed within four months, and the remainder to be removed within one month from that day.

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At an inquest held at Chesterfield, on Friday, on the body of a girl eight years of age, it was proved that the child met her death by drowning in an open sewer. A short time before this occurrence, it was stated, a man had fallen in and was nearly drowned, and many persons had had narrow escapes. The jury returned a verdict of manslaughter against William Tulcy, the borough surveyor, and three contractors who had charge of the cutting, and who left it in an unprotected state; and appended to their verdict an expression of opinion that the girl had met her death through the gross carelessness of the contractors and surveyor.

Our Office Table.

After many meetings, and much deliberation, the directors of the Forth Bridge Company have accepted tenders for the construction of the Forth Bridge. The directors did not deem it desirable to advertise for contracts, but invited offers from some half-dozen firms of acknowledged standing, and of the tenders submitted in compliance with this invitation, the directors, last week, decided to accept those of the following: — Messrs. William Arrol and Co., Dalmarnock Ironworks, Glasgow, the contractors for the Caledonian Railway Bridge over the Clyde; and Messrs. Vickers and Sons, steel manufacturers, Sheffield. With the exception of the steel chains on which the structure is to be supported, the whole undertaking has been placed in the hands of Messrs. Arrol and Co. The steel chains are to be supplied by Messrs. Vickers and Son. A good deal depends on circumstances as to the length of time which will be occupied in the construction of the bridge, but the opinion of the contractors is that it should be finished in six or seven years.

Dr. T. O. Dudfield, in his annual report as medical officer of health, testifies to the advantage of a vestry becoming its own contractors for dust, slopping, and watering, instead of letting the work out. He says: "The collection of ashes and other refuse from our 20,000 houses and other rated dwellings has been carried out on the whole very satisfactorily during the past year, the complaints having been few in number as compared with the old 'contract' times. The one thing needful for complete success is a systematic call at every house on a given day in each week. There is good reason to believe that the annoyance to which householders are exposed from the supposed neglect of the dustman not seldom arises from the refusal of servants to allow the dust to be taken away at an 'inconvenient' time. Also that complaint of nuisance in connection with dustbins is generally due to the improper use of these receptacles for the storage of vegetable refuse, and even of animal matter. It may be deemed a fair question whether those who thus misuse the dustbin, and then complain of your Vestry's 'neglect' should not be held responsible for the creation of a recurring nuisance?" Some progress has been made, Dr. Dudfield says, towards the provision of a public mortuary for Kensington. Provisional assent has been obtained for the adoption of a portion of the disused parochial churchyard, at the back of the vestry hall, as a site for the building, and Mr. Robert Walker has been instructed to prepare a design and plans for the same.

A Conference, under the auspices of the Sunday Society, was held in the Old Town-hall, Manchester, on Monday, in support of the movement for the opening of museums, art galleries, libraries, and gardens on Sundays. A resolution was passed rejoicing at the success which has attended the Sunday opening of public libraries in Manchester, and accepting it "as an evidence that the day is not far distant when the public libraries, museums, art galleries, and gardens will be open to the public during a great part of their weekly day of rest." Sir Coutts Lindsay, Bart., and the Roman Catholic Bishop of Salford supported the resolution. The latter said he did not know whether the people who took a strictly Sabbatarian view of the subject thought that a man was capable of saying prayers from morning to night. He could only say for himself that he was totally incapable of any such operation. If the higher classes might have their libraries and galleries of pictures and works of art to look over, and their gardens to walk through, he would ask, unless we were to have a purely class legislation, why men of the middle and poorer classes should not enjoy those advantages which in their corporate capacity they possessed?

A novel surveyor's recommendation came before the Bridgwater highway board at their last meeting. Mr. T. Hicks, who holds the office of surveyor, reported that in consequence of the depressed state of agriculture and bad times generally, and also the complaints as to over-rating, he had taken upon himself to give notice to all the workmen employed on the roads that they must submit to a reduction of wages all round of 10 per cent., and that their wages would in future amount to the average wages of farm-labourers in the district—namely, 11s. per week. He added that he also determined, if it was the wish of the board, to submit to a like reduction of salary, and by these means a total reduction would be effected of £300 a year. The surveyor was thanked for his generous offer, a hope being expressed that other officials would follow his example, and apparently *pour encourager les autres* it was resolved that the reduction in Mr. Hicks's salary should only be to the extent of 5 per cent.

We are sorry to see, from a letter sent by the Vicar of Arundel to the *Guardian*, that his appeal against Lord Coleridge's judgment is likely to be abandoned, the exact amount of interest in the case being represented by subscriptions from twelve gentlemen, amounting to £30 11s. As the probable cost of the appeal is £500, it seems most likely the vicar will have to withdraw the notice of appeal, for the clergy seem to attach little importance to the case from a religious point of view. As it is only less important architecturally, we should be glad to hear that a few architects and archæologists with a little money to spare—if there are any such in these times—had come to Mr. Arbuthnot's assistance.

Mr. Wyatt Papworth writes to the *City Press* with reference to a recent suggestion in that journal that the exterior of St. Paul's Cathedral should be cleaned down. He points out the hazardous nature of the process to mouldings and carved work if carried out by labourers using ordinary scraping tools, and asks why jets of water should not be employed for the purpose. In 1873, he says, the front of Hanover Chapel, Regent-street, was cleansed by a patent steam-jet process with most happy results; and the good condition of St. Peter-le-Poer Church, in Old Broad-street, is attributed to the fact that the parish engine is practised upon it.

A large number of persons assembled at the Auction Mart on Tuesday, it having been announced that Messrs. Driver, of Whitehall, would offer for sale, by order of the mortgagees, the mansion known as Kensington House. It will be remembered that this magnificent mansion was built for Mr. Albert Grant, though it has never been occupied, and was offered for sale by auction in July, 1877, when it failed to obtain a purchaser. The auctioneer, Mr. R. C. Driver, announced in his preliminary observations that a large portion of the purchase-money, about two-thirds, could be left on mortgage. The house, he said, had cost something like £150,000 to build, while the total outlay upon the purchase of the ground and the erection of the mansion, stabling, &c., had been over £300,000. The bidding was at first slow, the initial offer being £50,000. This was speedily followed by an offer of £100,000, and then by rapid advances of £1,000 upon each bid £117,000 was reached. The bidding now became more spirited, and an offer of £120,000 was made, speedily advancing —still by £1,000 bids—to £125,000. The next offer was £130,000, and from this sum the competition rapidly advanced—generally by £1,000 offers, but occasionally by £2,000—to £179,000, when the auctioneer, failing to obtain any further advance, announced that the property was not sold, the reserve price not having been reached.

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Lamp lough's Pyretic Saline is Refreshing, most agreeable, and the preventive of Fevers, Biliousness, Smallpox, Skin Diseases, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[Advt.]

Holloway's Pills.—Colds, Catarrhs, and other febrile affections can be readily arrested in their early stages by these Pills, if taken according to their cooling and purifying properties. These Pills control the circulation, reduce febrile symptoms, relax the skin; promote perspiration, and restore health.—Advt.]

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CHIPS.

A new Congregational church in the Lewes-road, Brighton, was opened for worship on Tuesday week. The style is Italian Gothic, and the cost has been £4,250.

The marble bust of Mr. Whiteford, late town clerk of Plymouth, which has been executed by Mr. E. B. Stephens, A.R.A., was formally placed in the council chamber of the new Guildhall, on Tuesday.

The Roman Catholic Church of St. Nicholas, in Francis-street, Dublin, is to be reopened on Sunday after renovation and repair. The work has been carried out under contract by Messrs. Dockrell, Sons, Martin, and Co., from the designs of the architects, Messrs. O'Neill and Byrne.

Extensions, including new dining-hall, are being made to the Cork District lunatic-asylum from the designs of Mr. W. H. Hill, architect to the governors.

The Walsall board of guardians last week approved plans prepared by Mr. Fleeming for the alteration and extension of the workhouses.

A Primitive Methodist chapel and schools are about to be built at Newmillerdam, near Wakefield, from the designs of Messrs. Kirk and Sons, of Dewsbury.

A new Board School was opened on Monday week at Wesley-place, Bingley, in the West Riding. It has cost £3,150, and will accommodate 250 children.

A series of sixteen blocks of first-class houses are about to be built at Carrigmahon, near Cork, on Lord De Vesci's estate, from the designs of Mr. K. D. Roche, architect, of Cork.

The new premises of the Society for Promoting Christian Knowledge in Northumberland-avenue were formally opened on Wednesday week. The building has been erected from the designs of Mr. John Gibson, at a cost of £70,000. It is Classic in style, and the chief elevation is entirely in Portland stone. We have fully described the building while erecting.

A Catholic school-chapel in Napier-street, Mountain Ash, near Merthyr, was opened on Thursday, the 2nd inst. It seats 350 persons, and cost £1,200. The Rev. Father Armand Hamelin, the priest for the district, has acted both as architect and builder.

In connection with the Congregational Church at Hopton, near Mirfield, which dates from 1662, there has just been completed, at a cost of £2,000, a series of day and Sunday-school buildings, including infants' school, 10 class-rooms, and Dorcas' meeting room.

The vestry of Bethnal Green on Friday adopted plans prepared by their surveyor for the proposed mortuary in the churchyard. The estimated cost is £3,000.

The old Colonial Office in Downing-street is in course of demolition, and on the site a large room will be erected, in which the Chancellor of the Exchequer will receive deputations.

The Wesleyan chapel at Turvey, Beds, was reopened on Sunday after re-pewing and other alterations, for which Mr. Day was the architect.

Rugby School has suffered a severe loss in the death of Mr. John Lucas Tupper, the able drawing-master. He had held the appointment since 1862, and on the opening of the Temple Art Museum he was elected as curator. Mr. Tupper, who was 55 years old, began life as a sculptor, and for several years was anatomical draughtsman at Guy's Hospital.

The conversazione of the Manchester Architectural Society will be held on Tuesday evening next, at 7.30 p.m., at the Memorial Hall, Albert-square, Manchester.

Messrs. Bellman and Ivey, of Wigmore-street, W., have been honoured by an appointment as Scagliola marble manufacturers to her Majesty the Queen.

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TENDERS.

Accrington.—For alterations to No. 15, Dutton-street, for the Accrington and District Permanent Benefit Building Society. Mr. Henry Ross, architect, Accrington :—

Accepted tenders :—

Mason :—	
Dickinson...	£50 0 0
Joiner :—	
Roberts	57 0 0
Plumber :—	
Threlfall	34 13 0
Plasterer :—	
Cronshaw	8 10 0
	150 3 0

Accrington.—For alterations to No. 42, Avenue-parade, for Mr. Councillor Lee. Mr. Henry Ross, architect, Accrington :—

Ashton and Cronshaw (accepted) ...	£27 10 0

Accrington.—For alterations and additions to No. 5, Blackburn-road, for Mr. C. Royston. Mr. Henry Ross, architect, Accrington :—

Accepted tenders :—

Mason :—	
Ramsbottom	£121 19 0
Joiner :—	
Waddington	97 0 0
Plumber :—	
Threlfall	34 17 0
Plasterer :—	
Cronshaw	21 15 6
Slaters :—	
Evans and Co.	8 0 0
Painter :—	
Riley	10 13 0
	294 4 6

Accrington.—For the erection of a detached cottage at Whinny Hill, for Mr. John Walls. Mr. Henry Ross, architect, Accrington :—

Ashton and Cronshaw (accepted) ...	£331 17 0

Accrington.—For the erection of six dwelling houses in Cobham-street, for the Accrington Victoria Permanent Benefit Building Society. Mr. Henry Ross, architect, Accrington :—

Accepted tenders :—

Mason (labour only) :—	
Ramsbottom	£512 0 0
Joiner :—	
Parker	620 0 0
Plumber :—	
Holt	225 0 0
Slater :—	
Clegg	144 15 0
Plasterer :—	
Cronshaw	162 0 0
	1,663 15 0

Chelsea.—For the construction of roads and sewers on the Cadogan and Hans-place Estate. Mr. Forbes F. Ashdown, engineer :—

Keeble	£1,513 0 0
Nowell and Robson	1,295 0 0
Mowlem and Co.	1,265 0 0
Killingback	1,220 0 0
Ford (accepted)	995 0 0

Christchurch.—For erecting parsonage house at Christchurch, Hants, for the Congregational Building Committee. Messrs. Kemp-Welch and Pinder, architects, Bournemouth. Quantities supplied by the architects :—

Davis and Son	£1,030 0 0
McWilliam	1,025 0 0
Ellison, Bros	993 0 0
Hoare, Bros. and Walden	975 0 0
Jenkins and Son	930 0 0
Walden, F. (accepted)	856 0 0

Clayton-le-Moors.—For the erection of a new infant school (Wesleyan), in Pickup-street. Mr. Henry Ross, architect, Accrington :—

Accepted tenders :—

Mason :—	
Foster	£300 0 0
Joiner :—	
Birtwell	175 0 0
Plumber :—	
Squires	37 8 0
Plasterer :—	
Hargreaves	21 0 0
Slater :—	
Whitehead	45 10 0
	578 18 0

Eastbourne.—For a new sea-wall at Eastbourne. Mr. Chas. Tomes, engineer :—

	In Concrete.	In Concrete Blocks.	Raising old Wall.
Firman and Hill... ...	£34,760	£55,000	£1,022 0 0
Hill, W. and Co... ...	22,300	28,000	1,090 0 0
Mace, J. B.	19,190	23,613	1,090 0 0
Hayward, J.	19,160	19,648	1,083 0 0
Jackson, J. (accepted)...	16,923	19,023	1,022 0 0
Harrison, J.	14,930	15,518	1,100 0 0
Hounson, J. and Sons...	—	—	1,132 0 0

Ingleborough Estate, Yorkshire.—For the erection of new farm buildings at Lanshaw. Mr. Henry Ross, architect, Accrington :—

Accepted tenders :—

Mason :—

Wilson.

Joiner :—

Parker :—

[The rest of the work by the estate workmen. Total cost, £312.]

Ipswich.—For the erection of a new post-office and school board and other municipal offices, for the Town Council of Ipswich. Mr. John Johnson, architect :—

	As Specification. £ s. d.	If all Portland. £ s. d.	Portland Strings, &c. £ s. d.	If Managan Steps. £ s. d.	If all Plated Glass. £ s. d.
Bennett, Bros., Ipswich ...	11,590 0 0 ...	11,747 0 0 ...	11,615 0 0 ...	11,590 0 0 ...	11,662 0 0
Perry and Co., Bow	11,500 0 0 ...	12,763 0 0 ...	11,935 0 0 ...	11,500 0 0 ...	11,580 0 0
Nightingale, London	11,430 0 0 ...	12,000 0 0 ...	11,857 0 0 ...	11,490 0 0 ...	11,549 0 0
Pells and Son, Ipswich ...	11,212 0 0 ...	11,827 19 9 ...	11,586 16 0 ...	11,278 4 6 ...	11,292 0 0
Everett and Son, Colchester	11,150 0 0 ...	11,784 0 0 ...	11,481 0 0 ...	11,220 0 0 ...	11,240 0 0
Smith, R., Ipswich	11,130 0 0 ...	11,745 19 9 ...	11,504 16 0 ...	11,130 0 0 ...	11,210 0 0
Cunnold, W. G., Ipswich...	10,997 0 0 ..	11,637 0 0 ...	11,365 0 0 ...	10,997 0 0 ...	11,077 0 0
Gibbons, Ipswich	10,800 0 0 ...	11,415 0 0 ...	11,174 0 0 ...	10,800 0 0 ...	10,880 0 0
Bardell, Bros., King's Lynn	10,500 0 0 ...	10,950 0 0 ...	10,710 0 0 ..	10,566 0 0 ...	10,590 0 0
Jones and Co., Gloucester...	9,736 0 0 ...	10,374 0 0 ...	10,070 0 0 ...	9,947 0 0 ...	9,829 0 0

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THE BUILDING NEWS

LONDON, FRIDAY, OCTOBER 17, 1879.

THE DAIRY HOMESTEAD COMPETITION.

THE British Dairy Farmers' Association annually offer prizes for designs for dairy homesteads. The drawings now on view at the Dairy show at the Agricultural Hall manifest considerable improvement upon those sent in last year, and upon which we commented. The number of designs submitted was apparently large, but at the time of our examination of them we noticed that several had been taken away from the screens arranged in the west gallery of the hall. We are glad to have to admit that, architecturally, the design under motto "In Toto," selected by the committee for the silver medal and ten pounds, is creditable to the taste of the judges, and that it does not violate any canons of architectural composition. The author is Mr. H. Wilkinson Moore, architect, of 32, Hill-street, Rutland-gate, and we are glad the problem of homesteads is engaging the attention of the profession. Mr. Moore's plan for a homestead for 50 cows is an excellent one, and the disposition of the buildings enables the stock master to supervise his stock with economy. The general arrangement partakes of the letter m form, the fattening house and standings for cows forming the north and middle blocks and the piggeries and stables, the two outer ones inclosing covered yards 57ft. by 32ft. on each side. The first named block is on the north side, and with the lateral buildings afford shelter to the stock. Though this type of farm is not uncommon, the author has worked out the details with some judgment: the food-preparing house is placed centrally at the north side, so that it is in convenient proximity to the fattening stalls, with which it is placed in communication by a longitudinal feeding-passage traversing the north block from end to end. There is also a central passage down the middle of the cow-house which accommodates 36 cows, and a side passage down the west block for the piggeries. The latter have their own food-house in the centre, with styes and open yards on the west front. The young stock are placed at the west end of the north block, and the cart shed and implements with granary over the former are located on the east side of the food-preparing house. The barn projects northwards from the mixing floor, and is in handy proximity to it. The lateral side blocks are about 15ft. wide, the centre cow-house is 30ft. All the buildings are span-roofed, the yards being roofed on a higher level so that ventilation may be obtained between the eaves and the lower roofs. Wooden rafters, with collars, kingposts, and struts are used; the ties are of iron and are fixed from the centre of collar to the feet of principals. The cow-house has a centre lantern running along it for ventilation, and the yards are sunk a little below the floor. Each yard has two sunk gutters, and a rain-water tank and filter are provided. Accommodation is afforded, in addition, for 5 young stock, 8 calves, 20 pigs, and 5 horses. The dairy and farmhouse are on the east of site, with a covered way in a line with the main feeding-passage of homestead. The milk, dairy and churning rooms are placed by the side of the covered way which separates the offices of house from it. A vigorous ink bird's-eye view is given showing the grouping and roofs; the gable ends of the covered yards and sheds have arched entrances and are treated sensibly and boldly in red brickwork, and a turret crowns the gable of the central block. The farmhouse and dairy are plainly but characteristically treated; the centre gable and window to house is a pleasing bit of Queen Anne. The author's estimates are as follows:—Homestead and covered yards, £2,076; ditto and open yards, £1,750; house and offices, £1,276. An alternative plan is sent with open yards. We shall illustrate Mr. Moore's design shortly.

The second prize of the bronze medal and five pounds has been awarded to a well-known agriculturist, Mr. Thomas Potter, of Grange Park, Alresford, Hants, who received a prize last year, and Mr. T. Mallinson, who sent in conjointly. This design for a farmstead for 20 cows is based upon a similar arrangement to the last; the cow-house is made the most important building and is placed centrally with doors facing south; the calving boxes are at the north end of this building close to the food department. Open yards are proposed 38ft. by 30ft.; the infirmary, hay-house, and cart-horse stable occupy the west block, and the calf-cribs and back stables the eastern block. A granary is provided over the food-preparing department, which is central and convenient for the supply of the stalls. The machinery department for converting and boiling meal, grain and pig-food, is well devised. The construction is simple, the roofs are of timber cross-braced, and the open sheds facing south form a continuation of the rafters on that side. All the large doors are hung to run on rails above, as in the hay and straw house, where they open on north side. The dairy has milk and churning room on one side and open shed and stores on the other side of a yard, both being conveniently attached to the farmhouse. The elevation, smudged with red and black, is poor and meagre in detail, but the isometrical sepia view of homestead shows a plainly treated set of buildings with timbered gables. The estimate is £1,094. Another design, evidently by the same hand, under the motto "As you like it," is highly commended, and embodies a similar principle of distribution. It is intended for a dairy farm of 80 cows. The cow-houses are grouped compactly together in the centre with feeding-passages crossing in both directions, thus dividing each quarter into 10 standings. On the north side is the food-preparing, straw and hay department, with a longitudinal passage-way. The cart-horse stable is on the west, the nag stable, &c., on the east side, covered yards each 61ft. by 34ft. being obtained between the buildings. On the south is a clean court bounded by a range of piggeries and waggon and implement sheds. The author claims for this plan that the cows are under the eye of the stock master, and that they are as near to the food-preparing shed and litter barns as possible. Several means of entrance and exit are provided to avoid crushing, and the cart and back houses, calving boxes, &c., are placed within sight and easy reach. A mill room and cake stores is shown over the food-house, and a granary over the straw-house; the pulper, cutter, cake and meal boxes are clearly shown. In construction the main buildings are roofed by three parallel and longitudinal roofs, the principals are of iron trussed rafters with ventilating lanterns over. Portland cement concrete is proposed for all the flooring. The estimate given is £3,665. Architecturally, the buildings are plain and suitable, but the chief recommendation of the plan is its compactness. Another design commended has the motto "Cheshire." It is shown by garishly-coloured elevations with timber framing and red brickwork in an ornamental Gothic style. The arrangement has two large yards with covered middens in the centre of each, the cow-houses or "shippons" being placed one on the north side and the other between the two yards; the piggeries form the east range and a detached stable and implement shed a block on the west side. Standings for 76 cows are provided. The food-preparing sheds are well placed at the junction of the shippons which have gangways; the calf-boxes are at the ends of these blocks. A more pleasing and artistically prepared set of drawings for a dairy farm of 200 acres bears the same motto. The shippons are divided by a centre passage for feeding, and form one block, the implements and stable forming another shed at right angles on the west side. The cart shed, with granary over and a straw-yard, form a third block on the east side. The red brick and timbered gables are simple and pleasing in their character, tile roofs are shown and circular openings in the upper stories. The house, with piggeries attached are also in red brick and tile, and are artistically conceived.

"Labor ipse Voluptas" is an elaborate scheme, in which the cow-houses for 60 are placed in a central position and disposed upon a cruciform plan with centre and intersecting feeding passages. The yards are on each side, and the stabling, &c., form the enclosing buildings. The idea is clever, but too expensive. "Red Star" is an oblong plan, with three ranges of buildings, the centre being a standing for 40 cows. Stables and workshops occupy the west range and fattening stock, and the piggeries the other side. The straw-yards are covered by laminated rib roofs, with corrugated iron and raised ridge ventilators. The food-house, granary over, and the barn in the rear are well placed. The chaff and litter-cutters are shown in the granary, with bins and hoppers to supply trucks in sidings below. The scheme is expensive in the distance of some of the standings from the food-store, and the roofing is costly. A rough outline perspective is sent. "Science with Practice" for a homestead for 32 cows shows an open square yard, 135ft. by 114ft., with manure-pit in the centre, a standing for 16 cows, with back feeding passage on the north side, and chaff and mixing room in centre. The barns are on each side of yard. The disposition is simple. "Valley of the Trent" has a well-conceived plan, but no drawings are sent in, the design being illustrated by a model. The two-yard and three-block arrangement is adopted. "Milk" is a crude set of drawings in outline. The design is conceived in an iron railway-shed style; the food-preparing house is in the centre, the cow-houses and stables form a square; but the design is rendered ludicrous by a tower of queer proportion perched on four legs, rising from the roofs of centre building. "Nil Sine Labore" is an octagon arrangement, and one we have seen before, but too ingenious and novel for practical use.

THE TOLMER'S-SQUARE INDUSTRIAL EXHIBITION.

AN industrial exhibition of more than ordinary excellence was opened last Tuesday by Sir Thomas Chambers, M.P., and Mr. Forsyth, M.P., in the Tolmer's-square Institute, Drummond-street, Euston-square. The exhibition has been chiefly promoted by the industry and skill of the working men and women of St. Pancras, and, from the specimens brought together, no one can doubt that exhibitions of this character are doing much to encourage the artistic capabilities of the classes chiefly concerned—the real workers in our towns. The bulk of exhibits are not the work of skilled workmen in different branches of manufacture; they are not mere trade exhibits, but the handwork of persons engaged in other occupations and duties. In looking over the rooms set apart for the exhibition, the obvious need of this class of workers is the training of the eye obtained by the study of art, and sufficient technical education to enable the amateur to turn his time and skill to the best account. We come across examples of work where the industry expended might have been better employed, or where more satisfactory results would have been accomplished if the eye and hand had had the advantage of an art training. Let us first take the artistic products. The water-colour and oil paintings particularly strike us. We notice some landscapes executed by a pianoforte-keymaker, others by a stationer's assistant, and a few by a dock clerk and a policeman; all the work of men who have doubtless a latent talent for art, awaiting opportunity. The boats by G. C. Blatchley, "At Rest," are clever. "The Parish Beadle," after Wilkie, by John Nelson, is evidently a work of great care, and has been copied from a print by the artist, who has had to find out the appropriate colours himself. These, as may be expected, are crude, the figures coarsely drawn, and the handling hardly equal to the essaying of such a composition. Portraits of a gentleman and lady (164, 165), by R. C. Grove, decorator, are painted with some vigour, and only need the refining graces of art. Such a landscape as 172, though a mere daub, has all the evidences of picturesque composition and colour to have made it a pleasing picture. The water-colour drawings display much skill and feeling for colour, as, for instance, Roses and Clematis on Trellis, by T. Shortland, a bookseller's assistant, and Group of Jugs, by R. J. Sparrow, locksmith; "The Collision of *Princess Alice* and *Bywell Castle*" is cleverly drawn and coloured by J. H. Smith, gilder. The pen-and-ink-drawings exhibit many specimens of skilful manipulation with the pen, as some by C. W. Wadman, a warehouseman, another sketch by W. G. Hudson, a clerk, and a study of "Low Life," from Landseer, by R. H. Ranger, book-finisher. In the artistic designs and works in glass, porcelain, furniture, and wood carving many excellent exhibits are to be found. Samuel Jones sends a design for stained glass and porcelain; the girls' heads betray a weakness, but the foliage is well drawn. A pair of painted plaques, by J. H. Powell, glass-painter (26), are cleverly treated; the painted window, by E. Sears (30), is well designed and executed, but the drawing of the heads in 31 is faulty. The painted porcelain plaque with Ophelia's head is expressive and feelingly painted in a sepia tint. Another has a representation of "Puck," with ass's head, an illustration from the "Midsummer Night's Dream." Mr. C. Maginn, artist on glass, contributes (No. 39) some tiles in frame in encaustic painting, the figures of which in processional order are painted with considerable freedom both in outline and colour. The composition is also clever. The same artist exhibits two humorous subjects on tiles in No. 40. One of the most striking exhibits in artistic furniture is a painted writing-table, No. 46, by L. Hossowski, a decorator. It is of black or ebonised wood with gilt mouldings; these are chiefly reedings worked out of the upright and horizontal pieces, the doors of cupboards and the panels have figures in Classical costume painted in light colour upon a chocolate ground. The painted leather panels (47) are better in the foliage than the figures, which are out of drawing. Two cases of panels (52), by Mrs. Grace Kinnear, artist, are crude. The painted foliage upon the frame and the figure are interesting as examples of misspent skill and labour. R. Dixon, grainer, sends some excellent imitations of woods and marbles (56), the oak and walnut are capital imitations. Some glass slabs and table-tops strike us in Nos. 53, 44, &c. Mr. G. H. Bull, a carver, exhibits (60) some clever medallions in oak and ebony, and an unfinished oak panel for a sideboard; and W. T. Comley, a turner, candlesticks and vases both well designed and turned. We notice in this department some skilfully executed fretwork in brackets, cabinets, &c.; but we turn to the amateur work, No. 215, for a variety of creditable specimens of fretwork or perforated wood. These comprise fancy frames, screens, crosses, &c., and are all the work of F. Mantel, a messenger. Carving is an art which easily lends itself to the grotesque; but a leap from the sublime to the ridiculous is certainly apparent in a work of which we give the artist's own title, "Our Lord's Supper made on the premises from pure sugar."

Cabinet-work, models, &c., fill some large tables, &c. Thus we see a cleverly-made aquarium by W. Phillips, machinist; a pair of mahogany brackets by W. Larkins, a servant; a revolving album by a machine-mender; inlaid boxes by J. Burradge, boot-maker. Baskets of fruit, including pears, apples, and peaches, imitated in wax, by Elizabeth Heptinstall, a book-sewer (No. 211), are strikingly realistic representations both in modelling and colouring, and would quite deceive the spectator by their appearance of reality. Models occupy, as usual, a large space. We have, for instance, the "Leaning Tower of Pisa," in cork, by F. Mitchell; Holy Trinity Church, Haverstock-hill, by C. Thorpe, porter: a model of a church by a librarian's assistant; a castle, by a warehouseman; a curious medley of Classic porticoes and pointed arches by a French polisher, besides various other cardboard models of yachts, frigates, engines, &c. The model of engine and Pullman's sleeping-car, 245, by F. Tomline; a horizontal engine and boiler by a brush maker, 247; and a case of carved and modelled figures in pine-wood, &c., by G. Kilpack, 251, are interesting instances of industry that might have been turned to better use. We must not overlook a screen composed of coloured scraps, by J. D. Legg, secretary, a fine ebonised cheffonier exhibited by Maple and Co., specimens of wood polishing, parquet floors, tools, gas apparatus for heating baths, by J. Osgerley, tinplate worker, in the miscellaneous exhibits. Messrs. Ewart and Son send a few specimens of their improved screw ventilators, and Messrs. Jones and Willis specimens of their "Hesperus" star lamps. An ingenious clock, with electric bell connection for a bedroom, for waking the occupant and sounding an alarm of fire, is exhibited by W. T. Clayton, a chemist's assistant, who also shows a clock-case of exceedingly suitable design. Mr. W. R. Davis shows some feeders for graining machine, and some interesting works in painted tiles, stained glass, &c., exhibited by young men under 18 years of age call for notice. Needle-work is represented by some very excellent and useful work, chiefly under-garments, by the girls of the Camden-road London School Board School. We notice some needlework pictures and other fancy articles in the upper school-room, one a cloth table-cover, in 3,000 pieces, by R. J. Morley, waiter. Drawings of maps and illuminated texts are abundant, and testify to the handiwork and skill of many in our elementary schools. An ophthalmia operating-chair, an invalid bedstead, and a fracture extension appliance are exhibited by McIlroy. These are in walnut, and of elaborate design. There are in all upwards of 400 exhibits, illustrating almost every useful handicraft, and the only hope we may express is that the example so energetically set by the working classes of St. Pancras may be emulated in other districts, and that the ingenuity that has hitherto been taxed in the production of shell models and patchwork counterpanes and screens, and the labour that has been devoted to compute arithmetically the number of years a given model has taken to execute, and the number of pieces of stuff it has taken to fit into a fancy quilt, will be directed shortly, by the aid of our technical and art schools, into more profitable channels. Mr. Forsyth's remark on the advantage of holding small exhibitions to bring out the individual labours of the working classes is one, we hope, that will spur the efforts of our educationists, and we trust that the exhibitions at Westminster and now at St. Pancras will help forward so necessary a movement.

ARCHITECTURE AT THE SOCIAL SCIENCE CONGRESS.

ONE of the questions that came before the Art Section of the Social Science Congress last week has sufficient interest for the profession to make it worth while to inquire into the arguments made use of in support of the proposition put forward. Mr. G. F. Watts, R.A., in his paper on the "Decoration of Public Buildings," a report of which we gave last week, spoke of turning our public buildings into great picture-books, leading to cultivation and affording a permanent source of pleasure. He observed "that the truest and most natural expression of painting and sculpture was called forth in their alliance with architecture, each being really imperfect in itself, and each requiring the aid of the other to render the harmony perfect." Mr. Watts remarked upon the value of art in church decoration; he also spoke of the popular appreciation of music of a high class, and considered that art wanted similar opportunities given it to make it popular. The best national school of decorative art, he observed, could only be created by means of the decoration of public buildings. We quite share with Mr. Watts the opinion that in a great industrial city like Manchester, where mechanical appliances possess a dominion, and everything depends on machinery, the human and artistic elements of our work have suffered, and that a cultivation of art would be a salutary corrective to the hard and lifeless tendency of a people engrossed in manufactures. Mr. Watts' idea of decorating the walls of our public buildings is an old one; art popularisers and philanthropists have preached the same doctrine; but, unfortunately, its realisation is destined to be ever a far-off ideal. In the first place, it would be impracticable to cover the walls of our public halls and museums with pictures of a class that the working man could understand without seriously injuring the object and use of the buildings themselves; for a picture to have a popular power, must portray subjects that would appeal directly to the feelings and understanding of the multitude—it must be treated in a style that would be incompatible with the architecture, the conventional forms and tones of colour most suitable would have to be sacrificed for the more striking forms of effect, and our walls would have to be painted with a series of pictures of a kind that is common in the cheaper illustrated papers. Of decorative art there would really be none in the right sense of that term, for the principles which underlie decoration applied to buildings would have to be completely set aside. The comparison drawn between popular music and pictorial decoration of the class recommended is not a just one. The simple songs, airs, or ballads which compose the staple music of our concert-halls do not affect the admirers of better and more elaborate compositions as a popular picture would affect the frequenters of a museum or a library for purposes of study, and the custom recommended would drag down to the level of the vision of the admirer of a picture the architectural qualities of the building. Let us suppose a music-room of simple construction adorned by a series of pictures as proposed by Mr. Watts, painted by students with copies of simple subjects, or a reproduction of designs from the *Graphic* and other illustrated papers, such as "Manning the Lifeboat," &c. Can we expect decorative art to be exalted by these specimens of crude art, tentative and imperfect as they would necessarily be? But, says the author, never mind if they turn out failures; the "walls could be used over and over again, as slates were at school." We shudder to think what would become of our buildings if left to the exercise of erratic genius in this manner, and the question is, whether real decorative art could be taught by these means. If our public buildings devoted to aritistic culture were to be made exercise grounds for this kind of indiscriminate art, how would the higher efforts of artistic genius fare, and what would become of architectural art? If, instead of suggesting the decoration with pictures of our national buildings, the walls of our workshops and factories were made means for the exercise of art ability, something more useful might be accomplished. But Mr. Watts' proposal aimed at art of too pictorial a kind. We might imagine our museums, schools of science and art, and libraries adorned by representations at once instructive and decorative, and the fields of natural science, zoology and botany, good outlines and conventionalised treatments of legends and moral maxims would afford at once a wide range of objects suitable for the purpose. Let these be executed by artists chosen from the working classes who have gained distinction in our technical and art schools, and we can then see if it be possible to develop a national taste for art. To depict on our walls the stirring events of English history, such as those which mark England under the Tudors and the Stuarts, and the Revolution, would need the pencil of artists like Leighton, Maclise, and Cope. Great and noteworthy incidents in the development of science and the mitigation of religious and social abuses, such as Wyclif's declaration, the invention of printing, Bacon's advancement of learning, the establishment of the Royal Society, the great inventions of Hargreaves, Watt, and Wedgwood, might worthily become the themes of decorative art in our educational buildings; but they should be executed with a correct knowledge of mural painting.

Mr. Murgatroyd, in his paper on "Street Architecture," argued in favour of an absence of monotony and formality in the laying out our lines of streets, and proposed some regulations in respect thereto, as well as the employment of good material and construction; but he failed to indicate the right course to pursue as to the former. We do not think the submission of designs or elevations for proposed buildings to local authorities would have the effect desired; local authorities, as constituted, are not fitted for the exercise of taste in matters architectural, and the charm of old Continental cities resides in the very unrestraint the builders enjoyed. Nothing would lead more to the monotony of street design than the proposal to make the local authority an architectural tribunal. Of course, as regards line of frontage, height of buildings, and their materials and construction, the local board is the proper authority, and we think if these regulations are carried out the variety of architectural design would be better left to individual idiosyncrasies and tastes. Girder-bridges, no doubt, is a subject that should come under a recognised authority; but we agree with Mr. H. C. Boyes in the opinion he expressed, that the liberty of the subject would be dangerously infringed upon if, in matters of taste, or building, every individual had to submit to an official rule. The very quaintness of old streets, and their picturesque lines, arose from the unlimited freedom of the citizens; but to try to make our streets picturesque by Act of Parliament would be a fallacy.

One other subject touched upon calls for a remark. It was the relation of building to landscape in a paper by Mr. H. H. Statham. The author contended that the effect is more pleasing when the lines of the building are in opposition to those of the landscape; thus a craggy and precipitous landscape requires low, heavy buildings of horizontal character, a level plain requires a spire to break its monotony. We quite admit the value of contrast and opposition of lines, but the author has unknowingly proved by his examples the converse proposition he seeks to demolish, and which has been so ably put by Herbert Spencer in one of his philosophical essays on art. Mr. Spencer, in that essay, speaking of the sources of architectural types, observes the incongruity of introducing a symmetrical Greek building in a mountainous or wild landscape, or that of an irregular castle upon a plain. He says the "partly regular and partly irregular forms of our old farmhouses, and our gabled Gothic manors and abbeys, appear quite in harmony with an undulating wooded country"; while "in towns," he observes, "we prefer symmetrical architecture." Every one will admit the truth and force of these remarks; a castle seated amid crags and precipices looks to be in its natural position; it appears to grow out of the rocky base, and the vertical lines of its masses and towers produce a feeling of fitness and agreement that pleases; place such an irregular pile upon flat ground like a lawn, and it at once looks ridiculous—it becomes a travesty only worthy of such architects as Nash or James Wyatt, and such landscapists as Brown. Mr. Statham indeed admits the incongruity, but as it does not agree with his theory, he says the castle looks ill in the latter case because it is out of place, and that the "influence of association" really explains why it looks better on a precipice than on a plain. He prefers to take the case of the Parthenon, which stands on a precipitous site, to exemplify the theory of contrast—an illustration we will refer to by-and-by, but we may observe there lurks a fallacy in this argument. Whether the castle was intended to be placed in a strong or inaccessible position by virtue of its purpose or not does little to alter the fact that it appears to our *vision* to reconcile itself to the precipitous situation better than to the plain; and no amount of simple association of ideas can ever account adequately for the natural and inherent fitness of forms and lines which, after all, is a simple matter of æsthetics based upon sensuous impressions. Even Alison himself does not deny the potency of lines. Unhappily Mr. Statham's argument is upset by his own illustrations, and the sketches given show that the author of the paper practically admits the theory of Spencer which he attempts to refute. The circular temple upon a precipice, from Claude's "Liber Veritatis," approved, is certainly less in harmony with the landscape than the second sketch, in which a castle is shown seated upon the same rock; and the composition afterwards given to illustrate the value of lines exhibits a combination that is in all respects similar in its lines to the last. Referring to the Parthenon, it is well known that the Acropolis forms a flat horizontal platform; the vertical lines of the rock had nothing to do with the erection of buildings of horizontal character; indeed, Thirlwall, the historian of Greece, speaks of the extent of its sea coast, and no doubt the Greek mind was more impressed with the horizontal lines of the scenery. No one will dispute that a Classical building admirably suits an expansive area of flat ground, and we may simply refer the reader to the effect of structures of this style in the broad streets and squares of Paris and other great cities. A wide stable base is above all a requisite condition for a building of Classic character. The other remarks in the paper are important to the architect who would study his buildings in reference to its surroundings; but the fundamental relation of a structure to the landscape ought certainly to be one of agreement and repose, and it is hardly safe to affirm positively that the features of a building should always form a contrast with those of the scenery.

WINDOW DRESSINGS.

WINDOW embellishment, if by that term we include the whole architecture of windows, is a subject of which the architect need never tire. It plays so conspicuous a part in the fronts of our houses and public buildings, that it is a strange thing it has not been treated of in a comprehensive manner. Professor Donaldson, years ago now, published a work on "Doorways," which is the only monograph we have on that important subject. The treatise was confined merely to Greek examples, if we remember rightly, and the modern doorway was not represented at all. But the window has changed far more than the doorway. Those who can remember 40 years ago know well that every window was merely a plain oblong opening, with a straight skew-backed arch of brick or stone; or else a square opening decorated after the manner of Vitruvius, Palladio, or Sir W. Chambers. This consisted simply of a flat-headed opening, usually a double square, with an architrave round the edge, broken at the upper part. Above this is a frieze and cornice, with pediment supported by two consoles, which latter are placed on the outside of the architrave at the shoulders. This form of opening is to be seen at Somerset House, at the Banqueting House, Whitehall, and in hundreds of our Classic buildings. Palladio, Inigo Jones, Sir C. Wren, and Chambers seem to have thought it a perfect type of window decoration, and when we carefully ponder over the *rationale* of its design, we shall find little that we can quarrel with. The architrave members form a frame to the opening, and relieve it of the baldness of a plain opening, while the cornice and pediment over protect the window, and form a drip or "brow" to throw off the wet, and to shelter the window from the vertical rays of the sun. The pediment or cornice also emphasises and gives expression to the window opening. In more florid Italian buildings, the architrave is superseded by a columnar ordinance which of course adds dignity and richness to the composition. The Reform Club House, by Barry, is a good example of this kind of treatment. The columns usually stand on pedestals with an open balustrade between. The reign of stone and stucco façades was remarkably favourable to this kind of window embellishment, but as soon as its dominion ceased, and brickwork took its place, this species of external decoration died a natural death. In many of Inigo Jones' designs, the plain architrave is often broken by rustic quoins, dies, or square blocks; the head has a series of arch and key stones which break it up and sometimes incline outwards, and the effect of the composition is to give an air of solidity and massiveness very becoming to some buildings, and generally suitable for the basements of massive structures. Brickwork, and especially the introduction of Gothic, voted this kind of ornamentation exceedingly dull and monotonous, and a series of modifications took place which our readers may well remember. Arches for the heads of windows came rapidly into fashion, sometimes semi-circular, sometimes segmental. These were often made to spring from an impost moulding. In more ornate buildings, this moulding was carved, and a pillar or shaft was introduced by way of enrichment below in the jambs—a modification which is still largely used, and which makes a leading feature in competition designs in the Italian style. It will be perceived that this modification was essentially Gothic, having been suggested by the shafted openings of Romanesque and Early Gothic buildings. The expedient is a simple and effective means of relief, and still maintains its ground, especially where brick is used. Other varieties are too numerous to mention. There are arches with moulded architraves stopping upon imposts, key-stone arches, circular arched windows, the tympana of which are solid, and filled with sculptured ornament, herring-bone and tile work, and openings relieved by continuous edge mouldings. These last make a large and conspicuous variety. Instead of projecting the moulding as in the old Italian architrave window, the outer edges of jambs and arch have sunk mouldings. A very rich effect is obtained by this kind of relief, and the opening is practically made larger. The moulding can be easily worked in brick as well as stone, and most of our modern buildings are adorned by windows of this kind. The moulded jamb is essentially Gothic in its spirit, though we find many buildings of professedly Classical character with ornamental openings. In this preference there has been something like a law of natural selection going on. In the streets of London and other large towns, the want is to get as much light as possible from the top and from the sides of a window. The old-fashioned square jambs and dressings protruded, and obstructed a considerable portion of the side and indirect light, but by having the jambs on the outer edges splayed, and moulded or sunk, a window opening admits the light of a much larger illuminated area of sky. In large monumental buildings the splayed or moulded window may become mean, and the architect has to resort to numerous devices to emphasise it in important façades. In Gothic this is particularly evident; a row of square or segment windows on the ground-floor, another row of pointed arched openings above, and a third and fourth tier of another form, say trefoiled or cusped, look uncommonly tame if they are all introduced on one plain wall, but we do not tire of repetition so much in a Classic building where two varieties of windows occupy the whole façade. Hence the value of projecting bays, oriels, and grouping of lights in all buildings where the windows are flat and have no external projection or dressings. Speaking of monotony, we may observe that the plain arched head is more wearisome than the square, two tiers of segment-headed or circular-headed windows invariably satiate the spectator; it leaves an impression of mechanical repetition. There are several means by which variety may be obtained. We can vary the shape in the successive stories, we can group or vary the interfenestral spaces, and we can unite vertically. A Venetian window, having a centre arched and two side narrow openings, always looks pleasing; a coupled window or a group of several lights under one set of mouldings may be made pleasing, and in the Queen Anne style the architect can adopt a variety of pleasing forms. The gabled bay window and other salient forms as we see in many of the old Kent and Sussex houses, are admirable instances of window embellishment for domestic purposes; but the chief advantage the style has brought with it is that the affected modes of window decoration common to both Anglo-Italianists and Gothicists are giving place to windows of reasonable construction and decoration, and, barring some crotchets, well suited for the wants of both public and private buildings.

A new school at Pollokshields has been opened by the Govan School Board. The total cost, exclusive of site, but including furniture, amounted to £6,804 8s. 2d., or eight guineas per child. The separate cost of furniture cost 8s. 4d. per child, and the total cost of site, buildings, and furnishing was £10 15s. 5d. per child.

WROUGHT-IRON BRIDGEWORK.*

THE object of the present paper is not to discuss the many methods of calculating the strains on the several members of any structure, but simply to consider a few points in connection with the designing, construction, and erection of bridges, which are not given in many text books, but which are very important features, and require most careful consideration. Science has made giant strides since the early days of bridge building, and if we carefully examine many existing structures built by our grandfathers we shall often find a preponderance of material where it was not needed, and occasionally, one or two weak points, but the generality of examples seems to indicate that their leading maxim was, "Be on the right side, and put plenty of metal in it." This plan showed either ignorance of true principles, or want of confidence in their design, or, as it often happens, a mixture of the two. But we may here mention, or rather repeat, that we certainly do not agree with the employment of such intricate mathematical formulæ as are given in many works for determining the strain on the different members of a bridge, roof, or any other compound structure, but more particularly of a continuous girder, for it is manifestly absurd to adopt such mathematical niceties at the first onset, when we know that before the bridge is constructed, or even designed, it will receive far rougher handling. For instance, suppose that by the most abstruse calculations involving the highest mathematics we eventually obtain, after covering sheets upon sheets of foolscap, a result, which may, if no clerical error has been committed, get the exact stress on every member of some structure, due to a certain fixed or moving load. Now to ascertain the amount of metal which is required to withstand that load with safety, we must determine what proportion the working stress has to bear to the ultimate breaking weight of the material employed, or adopt what is called a factor of safety, but this factor of safety is ambiguity itself. Some engineers design a bridge so that the maximum stress under any load shall not exceed 5 tons per square inch; others adopt $4\frac{1}{2}$ and 4 tons, and some more cautious men we have known to adopt $3\frac{1}{2}$ tons per square inch; so we have in this instance a difference of 30 per cent. in the sections required to withstand the same strain.

Again, we cannot always insure the structure being kept well painted; indeed, portions of many structures it is impossible to paint after they are riveted up and erected, and we can easily imagine the loss of section which must thus gradually take place from oxidation.

We also know, from the experiments of Fairbairn and of Wohler, that the molecular structure of wrought iron undergoes a complete change after being subjected to so many vibrations, the change being greater the nearer the live load approaches the elastic limit; and as bridges are daily subjected to such vibrations, it is only natural to conclude that the tensile strength of the iron employed in these structures is gradually decreasing when subject to a high unit strain; so that bridges, like mortals, have only a certain time to live.

If we also consider the theoretical section required for the ends of the top and bottom booms, and for the web-plate or lattice bars at the centre of a girder, we find it is ridiculously small; and if we compare the factors of safety employed for these parts by different engineers, we shall find a difference of from 50 to 100 per cent. The theoretical section could not be adopted practically, and it has to be left, not to the mathematical ability of the designer, but to his judgment.

Taking all these matters into consideration, we feel quite justified in saying that intricate mathematical calculations are not at all essential in designing a structure of any kind, and that results so obtained are falsely accurate. We remember meeting with an absurd illustration of this false accuracy, in the case of an excise officer, who gauged the malt, &c., with his ordinary two-foot rule, and subsequently forwarded his report to head-quarters worked out to fourteen places of decimals. It must not be thought from our foregoing remarks that we are advocating the cause of the "practical man;" far from it. Our remarks simply refer to the designing of a bridge, for we know that in original investigations, and in deducing laws from certain experiments, it is absolutely impossible to proceed without the use of higher mathematics; but when the law has been deduced, it is necessary, before it can be applied in the designing of wrought-iron bridgework, that it should be expressed in formulæ as simple as possible, all unnecessary elements being eliminated. We certainly advocate, when possible, the use of diagrams of stresses as being the neatest, quickest, and most accurate way of determining the required sections of the different members of a bridge. One of the most important points to be considered in designing a bridge is the effect due to the rolling load to which it may be subjected. This point formerly was soon settled, as it seems to have been the universal custom amongst the earlier engineers, and is retained still by a great many of the present day, to reckon the rolling load as 1 ton per foot run for a single line of railway, and $1\frac{1}{2}$ tons per foot run for a double line, irrespective of the length of span, which was evidently not considered. Now, a little consideration will show that small spans are subjected to far greater strains per foot run from the effects of rolling load than larger spans; and upon examining many existing structures, we find that the main girders are strained to a far greater extent than the designers evidently intended they should be, and but for the "plenty of metal" maxim, many of them would be actually unsafe.

Let us take, for example, a tank locomotive of 45 tons weight, and having six wheels coupled, we should then have a weight of 15 tons on each pair of wheels, assuming that the weight is equally distributed by means of compensating beams. If we now take a span of 10ft., the maximum load would be attained when one pair of driving-wheels was on the centre of the span, which would be equal to a distributed load of 30 tons, or 3 tons per foot run of the span. With a span of 20ft. the whole weight of the engine would be on the bridge, that is to say, 45 tons distributed over 20ft., or $2\frac{1}{4}$ tons per foot run. With a span of 30ft. we should still have the same weight on the bridge, and on account of the overhang of the engine at the ends, we should not be able to get more weight upon it; and as the weight would be neither a central nor a distributed load, by working out the moments we get an equivalent distributed load equal to a little more than 2 tons per foot run. When we get to spans above 30ft. we have to consider what kind of load is likely to follow after the tank-engine; and as it is a common practice to have two engines drawing a heavy train, we must deal with the weight of two such engines, or 90 tons on six pairs of wheels, and as these would cover a span of 60ft., the equivalent distributed load would be $1\frac{1}{2}$ tons per foot run. As we get into the larger spans it would not be fair to assume the load as consisting of a train of locomotives only, such a train being exceedingly unlikely. We, therefore, have the lighter rolling stock coming into action, such as waggons, passenger carriages, &c., and taking the maximum weights of the present rolling stock, the equivalent distributed load per foot run gradually decreases until we come to about 1 ton per foot run for a single line of railway over a span of 300ft.

So far, we have only considered the rolling load statically, taking the cases of girders loaded with certain dead weights, but if we consider these weights as actual rolling weights, as in the case of a locomotive passing over a bridge, and note the dynamical effects, we shall find a number of other actions coming into play, which will be found to materially affect the strains due to the rolling load, and in the case of short spans, where the moving load is great in comparison to the dead load, increasing them to no small extent.

About thirty years ago many of our eminent engineers and mathematicians were busy discussing the question of a possible increased deflection with an increase of speed of the rolling load, but, unfortunately, the results obtained were so alarming and contradictory that it is difficult, if not impossible, to obtain much information from them, as will be seen by the conflicting evidence of some of our greatest authorities. The celebrated experiments at Portsmouth, and on the Ewell and Godstone bridges, conducted by Colonel Sir Henry James and Captain Galton, and the mathematical results obtained by Professor Willis and Professor Stokes, seem to prove conclusively that with a speed of about fifty miles an hour the dynamical deflection increased from one-third to double that of the statical deflection. Stephenson, in his evidence before the Royal Commission, stated that if the engine happened to jump on the springs, an increased deflection might occur, but if it was a question of mere velocity, he did not think it would increase the strain on the girders. Rastrick, taking as a comparison the case of a man skating on the ice, did not think there would be any increased deflection with an increase of speed. Brunel's impression was that the dynamical deflection should be less than the statical, but he did not give it as a decided opinion, on account of the extreme difficulty of trying and recording the results of the experiments. Cubitt and Fox both considered that the dynamical deflection was the same or less than the statical deflection, while Hawkshaw and Barlow have expressed opinions to the contrary.

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* From the *Engineer*.

The results of the Portsmouth experiments, and the solutions of Professors Willis and Stokes, were, to say the least of it, alarming; and when we find that the theoretical solutions are borne out by experiments, we can hardly feel justified in not accepting them as the truth; but it has been pointed out by Professor Rawson and others* that the results obtained from the labours of Professor Willis are based on purely hypothetical principles, viz., "that the reaction between the moving weight and the beam is equal to the weight which would be necessary to deflect the beam when placed on it at rest as much as the travelling load deflects it, which may or may not give correct results, according to the dimensions of the quantities of the fixed data of the problem." Mr. Baker has also explained† how we might erroneously be led to expect, from theoretical considerations, an increased deflection under a rolling load, on account of the maximum deflection of a suddenly imposed load being double that of the same load when at rest. This he explained by taking the work done in each case, measured in foot-tons. The product of the mean resistance of the beam into the deflection must be equal to the product of the weight into the deflection; therefore, the mean resistance of the beam is equal to the weight, and as the former is zero at the commencement of the deflection, it must be equal to twice the load at the end. But this can hardly be taken as a parallel case, for the load of a railway train passing over a bridge is not suddenly imposed; but, of course, the smaller the span the quicker will the load reach the centre, and so more nearly approach the above conditions. Hence the effect of the rolling load will be felt more on the cross girders than on the main girders, and the nearer they are placed together the greater will be the deflection, but by connecting them firmly together by means of longitudinal girders that deflection is to a certain extent remedied. From recent observations which have been made on existing structures by different experienced persons, and the results of the labours of some of our eminent mathematicians, it is conclusively proved that rolling loads do increase the deflection of girders, but not to the alarming extent as was first supposed, and in most cases it may be neglected.

There is, however, another source from which we must look for increased deflection from the effects of rolling load. If we examine the results of the experiments made by Baron Von Weber, on the axle springs of locomotives, we find results far more startling than those of the Portsmouth experiments. He found from very accurate observations, extending over a long period, that the deflections of the springs indicated at times as much as nearly twice the amount due to the normal load. If we stand on the platform of a through station, with a long length of straight line coming into it, or on a bridge crossing the line, and watch with a field-glass the motion of an express engine coming along, be the lines ever so evenly laid, we shall notice the engine oscillating considerably; and this oscillation must necessarily be communicated to the springs, and cause an increased deflection. In addition to the side oscillation or rolling action just mentioned, Baron Von Weber found from the deflections of the trailing and leading wheels that the engine had a pitching motion to a very large extent. These actions are probably due to imperfect balancing of the machinery, deflection of the rails, bad joints, the reciprocating action of the pistons, obliquity of the rods, and other minor influences; but at first sight it seems almost incredible that any of these influences could possibly cause the great deflections recorded. If, however, we consider the great weight of the moving mass, and the small distance it would have to travel to give the increased deflection, and how these disturbing influences accumulate, we may perhaps realise the existence and the extent of such actions. The rails of the permanent way we know deflect when the weight of a locomotive is resting on their centre, midway between two sleepers, to an extent varying of course with the section of the rail; and with a succession of these deflections as the engine passes each sleeper, an oscillation would be set up, the nature and extent of which would be governed by the speed at which the engine was running; for this oscillation would resemble a wave of a certain length, and if this length were a multiple of the distance between the sleepers, the oscillation would be increased or decreased as the crest of the wave fell on the sleepers, or midway between them; and according to these conditions the deflections would be registered high or low. This is familiarly illustrated in walking across a long plank, and it is owing to this action that soldiers are required to break step in crossing a suspension bridge or other light structure; and an analogons case in physics is the beautiful phenomenon of interference discovered by Dr. Young.

In passing a curve the springs of a locomotive would be deflected on account of the centrifugal force more than on one side than the other; and thus we have another case of the registered increase of deflection beyond that due to the normal load.

It now remains to be seen what are the consequences of these great deflections of the springs, whether they inflict corresponding strains on the main girders of a bridge. We think not, for we have no evidence to prove that all the springs were deflected together, although it is possible, but hardly probable, that at times they might have been; and when the springs of the trailing wheels indicated an increased deflection, it is most probable that at the same moment the leading wheels were relieved accordingly; and when the springs on one side indicated increased deflection, those on the other side were similarly relieved. If we neglect the extra pressure on the rails due to the action of the piston, and only consider the actions which affect the springs, we may safely conclude that on a well-laid line the gross pressure on the springs at any moment is nearly constant, and consequently the different actions just mentioned will not in any way affect the main girders of bridges above a moderate span, but will of course punish the rails and cross girders on account of the concentration of the load.

From these considerations, the advantage will at once be seen of having the cross girders connected by stiff longitndinal girders, and making the whole platform of the bridge as rigid as possible; for by adopting this plan the extra strains cannot be localised, but will be distributed over the whole structure. In short spans these increased deflections will of course affect the main girders, and for the reasons mentioned in the earlier part of this article, it is absolntely necessary in such cases, especially in bridges for passenger traffic, to adopt a low unit strain in our calculations.

For foot-bridges opinions seem to differ as to what is the safe amount to allow per superficial foot for a crowd of persons, and it is astonishing the number of men—nearly always Irishmen by the bye—that have been dragged into a room or on to a scale-board, to ascertain this amount. We find that the result of these trials varies from 80lb to 120lb., but we, however, consider, as our calculations are generally worked out in cwt., that 112lb. is a very convenient number, and one that allows of a sufficient margin of safety.

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HIGHLAND ARCHITECTURE.*

By Professor John Stuart Blackie.

It is of importance, both as a matter of good taste and of good policy in a pecuniary point of view, that care should be taken by Highland proprietors of places which are undergoing enlargement, to prevent the architecture from running into the hybrid type, which mingles the urban and the rural style in a manner that destroys the picturesqueness of the one without attaining to the stateliness of the other. Of the Highland towns with which I am acquainted the one that has most happily evaded this danger is Braemar; the one which has run right into it, and wrecked its natural beauty in the most signal fashion is Oban. No man who knew Oban thirty years ago will fail to recognise the lamentable change which has come over the face of perhaps the prettiest little Highland town north of the Grampians; houses of all shapes and sizes, and without the least attempt at picturesque ornamentation, planted as if dropped from a balloon, in the most improper situations, and in the most obtrusive style possible. The causes which have brought this misfortune on Oban are principally three—want of space, as in the case of Portree and Tobermory, causing a crowding of the structures on the narrow level close to the shore; the eagerness to be rich, and the desire to increase the rental quickly without any regard to the æsthetic capabilities of the ground; and, in the third place, the unfortunate circumstance of the land on which the city stands belonging to half-a-dozen proprietors, who are either not rich, and therefore little able to resist the temptation of an additional ground rent at the sacrifice of a natural beauty, or non-resident, and therefore less careful of any prominent ugliness not visible from the door of their own mansion, and anyhow, as a loose body, with difficulty capable of the combined action which would be necessary to preserve a common type in the architecture of a rapidly-increasing little town. In Braemar, on the other hand, we have only two large proprietors, both naturally actuated by the same motives in preserving a certain rustic and Highland character to the place; and both having the sense to perceive that the peculiar type of architecture found on the one side of the Cluny water should, as much as possible, be preserved on the other. Of the type thus established, the most marked features are that no house should be more than two stories high; that each house should stand separate, and not run with its neighbours into the continuous form of a street; and that, though the gables are not presented to the road, yet the triangular topping should everywhere meet the eye as a prominent feature in the roof windows. Even in the inns or hotels, as they prefer to be called, where magnitude is most natural and room most precious, this feature at Braemar has, in the main, been preserved; whereas at Oban they have got "a Great Western" and a Saint Columba Terrace quite in the style of the West End of Edinburgh, which, in the present state of the little Highland town, is a wretched affectation, and a splendid piece of bad taste. Whether this magnificent blunder will be redeemed by the urban destinies of a future "Celtic Liverpool," as some railway speculators fondly imagine, our great-great-grandchildren may know; in the mean time, the Great Western Hotel in Oban is as much out of keeping with the embryo town to which it belongs as a purple patch or trimming of gold lace would be on a Quaker lady's shawl. There is another type of hotel frequently found in the Highlands, raised under the direct patronage of the great goddess Utilitaria, whom all Scotland and the world worshippeth. I mean not the elegant style of provincial West-Endism, but the mere unlovely presentation of bulk without grandeur and without grace. This is a style of which there are not a few examples in the workhouses and lunatic-asylums scattered through the country. Its peculiarity is to be as little removed as possible from the simple type of blank walls with long rows of square holes cut out in them, which Mr. Ruskin noted as the characteristic style of the unreformed New Town of Edinburgh, and in reference to which he said that it always gave him pleasure to come to the corners of the cross streets that he might look out from the contemptible work of man to the great work of God in the green hills and the shining sea. The hydropathic establishments, which, at present, are being grandly overdone in the Higldands, have a tendency to run into the same offence; they are huge, without the majesty of the Florentine palace; while they are, at the same time, utterly destitute of that lightness, quaintness, and variety which the builders of our old baronial castles and manor houses knew to combine, with solidity of structure and a certain massiveness of appearance.

I should not have thought it worth while to make these remarks had it been only for the luxury of expressing well-merited praise, much less for the sake of imputing accidental blame. But I am not without hopes that the public discussion of such matters may prevent the repetition of such gross offences in this sphere as have not seldom been perpetrated, and that in places where better things might reasonably have been expected. At Aberfeldy, for instance, which lay altogether under the eye of the last Marquis of Breadalbane, there was run up a row of the most blank, grey, and altogether unlovely houses to be found anywhere in the Highlands; and that this was done out of pure carelessness, not from want of taste on the part either of the Marquis or his clerk of works, is evident from the good taste which strikes the eye in the little village and inn of Kenmore, immediately before the Castle-gate. A great proprietor ought to consider it one of the most enviable privileges of his position to allow no buildings to be erected on his property which do not express, in their external features, a character corresponding to the aristocratic claims and high social position of the owner. Whatever may be the social or political evils that flow from the monopoly of the Scottish soil in the hands of a very small portion of the community, this æsthetical advantage the large proprietor undoubtedly may boast, that he can prevent his land from being cut up into small patches without grace of outline, and from being studded with a chaos of houses which have neither harmony in their style nor elegance in their execution, nor even convenience in their plan. In architecture, as in social organisation, pure democracy and unfettered individualism mean confusion.

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* *Transactions* Literary and Philosoph. Soc., Manchester, 1865.

† Long and Short Span Bridges. By R. Baker.

* From the *Scotsman*.

Shortly after writing the above, I took a drive down the river to Ballater, and on walking through that little mountain town, the janitor, so to speak, of the Aberdeenshire Highlands, was much struck with the tasteful appearance of a clump of buildings in the west end of the town, as contrasted with the general grey prosaic sobriety and formality of the place. On inquiry I found that this was a barracks, or summer quarters for soldiers in attendance on Her Majesty; and on my further expressing wonder that a barracks should have been erected in a style so different from the plain and bold vulgarity generally considered typical of this class of buildings, one of the red-coats explained to me that this had been done in obedience to the command of the Queen, who had expressed her abhorrence of the apparition of any building in that district not bearing on the face of it a congruity with the picturesque character of the landscape. If this account be true, as I imagine it is, all tourists in those beautiful mountain regions have great cause to be thankful to Her Majesty, not only for her good taste shown in this peculiar locality, but for the noble example she has thus set of how architectural art should be made to harmonise with the general expression of the scenery of which it forms a part.

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ART, LITERATURE, AND SCIENCE.

At a recent Fine Arts conversazione held by the mayor, in the Council Chamber, Salisbury, Mr. Charles Tomlinson, F.R.S., delivered an address, in the course of which he spoke as follows:—

Surrounded by these beautiful works of art, and called to speak on art, he would characterise her as the oldest of the three sisters Art, Literature, and Science, the three graces, more beautiful because more intellectual and beneficent to mankind, than the graces of mythology. He represented art as the oldest of the three sisters, because in the researches of geologists among the ancient caves specimens of art from the hands of primeval man had been brought to light, and the history of some of the remote geological periods had to a great extent been read by the inspection of the rude implements and weapons of war and the chase, as well as the domestic utensils, used by this people, thus showing their habits and intellectual tastes, as exemplified in their wonderful specimens of carving, such as the tusk of the mammoth so carved as to represent the mammoth itself. He regarded art, therefore, as the oldest of the three sisters. By art, he supposed, there must be meant something that appealed to our sense of beauty, a sense which, like all other senses, requires to be cultivated; a sense which, like other senses, may be absent, and is absent in a great many individuals, just as that peculiar sense of hearing, known as the musical ear, is absent in so many people. Many persons, too, are colour-blind, cannot distinguish one colour from another, whilst in others the sense of smell is absent, and many persons have not the sense of beauty. Art, then, aims at the cultivation of this sense. An old pupil, who was fond of wandering about his native Tasmanian forests, told me that wherever a clearing was made a wonderful flower, one of the most beautiful known in natural history, would spring up. One day while the woodmen were at their dinner he held up one of these flowers, and said to one of them, "Isn't this beautiful?" A woodman said, "I have heard people say so before, but I can't see it myself; I don't see anything to admire in that flower." That man was wanting in the sense of beauty; and it must be admitted that the sense of beauty, as developed by the artist, requires culture. The second sister, literature or letters, requires perhaps a still greater degree of culture. The earliest form of literature was probably brought into existence when one of the race of primeval man, one of the cave dwellers, addressed his tribe, and as he warmed with his subject, his language would naturally become more and more figurative, and fall naturally fall into rhythm, so that it may be inferred that poetry preceded every other form of literature. This poetical expression proceeded from emotion, and just as art is an appeal to man's sense of beauty, so poetry is man's thoughts tinged by his emotions. Prose probably assumed its first form in inscriptions chronicling events in a concise language. But these two sisters, art and literature, the two elder of the triad, have probably attained their majority, and in future will have to yield to their younger and more powerful sister. This third sister, science, came late, but has already outstripped the other two, and has before her a greater future. Art and literature had probably already done the best that ever would be done. He thought they must admit that the best pictures had already been painted, the best marbles already sculptured, the best books already written, the best music already composed, and it need scarcely be added in Salisbury, the best building already erected, so that the arts in future were not so promising as the young giant science. Science is so strong, perhaps, because it rests on a different basis as compared with the others. Science owes its strength to the discovery made by Lord Bacon about 300 years ago. In reviewing science, he asked the question why, while literature and art had done such wonderful things in improving the condition of mankind, science had done so little; and he made the remarkable statement that science had hitherto failed because it had proceeded on a wrong basis: it had enquired after the causes of things which they could never know, and neglected the laws of phenomena, which everybody could understand. Why that gas was burning and giving us light, why it should be inflammable while other gases with a similar physical constitution were not, it was impossible to say; all that they could say was that there was an intelligent first cause, an all-wise Creator, who had endowed all things with their respective properties, which we may study, observe all the phenomena, and then ascertain the laws or conditions under which they exist. We don't know why the different bodies in the universe attract each other directly as the mass, inversely as the square of the distance; but it is an immense gain to know this law, for by its means vast numbers of facts become intelligible which before were obscure. By pursuing this inductive method what a wonderful advance had been made by science in the last 300 years. All the grand discoveries, all the modes by which life had been made more endurable, pleasant, and profitable in every way—railroads, telegraphs, steam-engines, and all the innumerable things which characterise modern life and civilisation, were the results of scientific progress. Then the future of science was great. What science had done already was small compared with what she would do in the future. He thought he was justified in saying that the future of science was something grand and incalculable, whereas he could not speak hopefully of the progress of art. They could not produce the beautiful marbles of Phidias, the paintings of Michael Angelo, of Leonardo da Vinci, and of Raphael. All they could do was to follow those great men at a humble distance. It was the same in literature. We shall never have another Homer, another Shakespeare, another Dante, so that he thought he was justified in saying that science had a vast future before it, which did not belong either to art or to literature, unless another Bacon or another Newton in art and literature were to arise to give them their code of laws and start them on an altogether new course. Was this possible? Hitherto writers on art had dealt rather with matters of detail than on laws and principles. In science they were impatient of detail unless it led to the clear and distinct enunciation of law. Was it possible in the future to find out some law or laws, or principle or principles, which should regulate art? Suppose it were possible to produce a picture by, say, Raphael, which picture the world had never seen, and the painter of which was not known. Suppose this picture by Raphael were hung up in that Hall, and competent judges of art from all parts of the world, speaking different languages and having different sympathies, but all united in their skill in art, were to meet before that picture, they would say it was a first-rate work, and they would be able to say it was by Raphael. They would know the individuality of the man as stamped on the picture just as a book, or a poem, or a handwriting displayed the individuality of a man. In addition to the mechanical treatment of the picture they had the individuality of the man stamped upon it. Well, all these competent judges would agree that this was a first-rate work of art, and that the artist was Raphael Now he did not think that such a conclusion could possibly be arrived at unless art rested upon principles and upon laws, just as science rested on principles and laws. But in science there was a greater capability of demonstration than in art. All that he had read on art possessed a certain sort of vagueness as to what were the conditions necessary to the production of a great work of art. Were they capable of being expressed by laws? Hitherto that had not been done, and the question was will it ever be done? If we could thus ascertain the scientific principles of art, it might be possible to progress and advance to a still higher point of perfection even than in the works of those who had benefitted the world—in the works in marble of the ancient Greeks, in the paintings of the Italian school. He thought the same remarks might possibly be applied to literature, which rested on the science of logic and sound reasoning. Unless a book were well reasoned and certain rules or laws of logic and rhetoric were observed, it was not a satisfactory book, and would not live. He thought literature might possibly, but not probably, have a future which might be worthy of the past, but this did not seem to be likely in the case of art. They talked in these matters about the genius of the artist, the musician, the poet, and the author. He was not sure that the word "genius" had been very well defined. He believed genius was nothing more than a capacity for taking infinite pains. Before he came out, he took the liberty of putting into his pocket a book from the library of his host, Mr. James Hussey, and he would like to read a short passage from it. Mr. Tomlinson then read an extract from Sir Joshua Reynolds' Discourses to the effect that when we read the lives of the most eminent painters it was found that no part of their time was spent in dissipation. Even an increase of fame served only to augment their industry, and to be convinced with what persevering assiduity they pursued their studies, we have only to reflect on their method of proceeding in their most celebrated works. When they conceived a subject they first made a variety of sketches, then a finished drawing of the whole, after that a more correct drawing of every several part; of the hands and feet, pieces of drapery, &c. They then painted the picture and after all retouched it from the life. The pictures wrought with such pains now appeared like the effect of enchantment, as if some mighty genius struck them off at a blow. This opinion of Sir Joshua Reynolds embodied the truth that in all works calculated to live, the artist, author, poet, painter, and sculptor must take infinite pains, and by means of that infinite pains he will produce works that will live. Mr. Tomlinson then referred to the indomitable perseverance of Sir William Herschel in the manufacture of a reflector, and said the life of that great man was one of infinite pains. Sir Humphrey Davy and Faraday were also mentioned as examples of thorough devotion to work. Now to apply this to themselves. He could not help thinking that if they derived all the advantage which they might do from literature, art, and science, they would proceed on a somewhat different basis to what they were accustomed nowadays. The national schools established at the beginning of the present century had produced something like three generations of readers in a class that did not read before that time. The taxes on knowledge had been removed, science had come forward with her steam-engine able to print an enormous number of sheets in an hour in order to supply the great demand for reading. The large demand, however, very much vitiated the supply, and authors now wrote rapidly, loosely, and carelessly, and it was the same in every department of art, as well as in popular science and literature. He could not help thinking that people read too much; that the circulating library was a great evil in the present day; that the railway bookstall was also an evil. They should fall back on their old authors, study the works of the old musicians and of the old painters, who had devoted such infinite pains to their productions, and, while doing honour to them, they would at the same time be most effectually promoting their own culture.

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THE CITY OF LONDON TECHNOLOGICAL EXAMINATIONS.

THE programme for 1880 of the City and Guilds' Institute for the Advancement of Technical Education proceeds much upon the same lines as those laid down for the similar examinations held in connection with the Society of Arts. The City and Guilds' Institute will accept the committee of any art or science school under the Science and Art Department, or any school board, or any local examination board connected with the Society of Arts, as a suitable committee for carrying on the Institute's examinations, and in special cases they may entertain propositions for the establishment of special local committees. The examination will be held in three grades—1. Honours, intended principally for foremen, overlookers, &c.; 2. Advanced, for journeymen; and 3. Elementary, for apprentices; but candidates may enter for any grade. Certificates (first and second-class) will be awarded in each grade; but before a candidate can obtain a full certificate in technology he must pass the examination of the Science and Art Department in certain science subjects. That is to say, a candidate may pass the technological examination, and will receive a preliminary certificate, which will be exchanged for the full certificate whenever the candidate passes in science. There is no limit to the age of the candidates, though it is scarcely to be expected that many of the older workers will attempt to pass; but the regulation given above will have the effect of preventing many from entering themselves, for it will be seen that although a man may pass in honours in technology, he cannot obtain the full certificate until he also passes the elementary stage of one of the Science and Art examinations. There are many thousands of thoroughly competent workmen who will not "go to school again" in order to get this elementary certificate from the Science and Art Department, although they would doubtless be not only willing, but anxious, to obtain the technological certificate. So far as apprentices and the younger workers are concerned, the objection we (*English Mechanic*) have urged does not hold with so much force; but it must not be forgotten that it is the primary object to introduce technical education as part and parcel of the regular training of workmen, and that, for the present at least, no effort should be spared to induce them to come forward. By-and-by, when the mass is leavened, and it is found that a man with a certificate takes precedence of those who do not hold that testimonial, there will be little need to entice candidates; and they will come as a matter of course. As to the grants to teachers, we think, considering that students will probably present themselves in small numbers only, and that the subjects require special technical knowledge on the part of the teacher, that they are inadequate; for the Institute offers only £2 for each candidate taking a first-class, and £1 for each second-class in the three grades. To obtain that sum the teacher must have given the candidate at least twenty lessons in the technological subject in which he passed, as no payments will be made on account of lessons in a kindred science subject by which grants are earned from the department. The prizes offered are possibly sufficient to attract a respectable number of candidates, as three are given in each grade of the twenty-six subjects in which examinations will be held. Thus in the honours grade the first prize is £5 and a silver medal, the second £5 and a bronze medal, and the third a bronze medal. The prizes in the other grades are the same, with the exception that the money prizes are £3 in the advanced grade, and £2 in the elementary. The first edition of the programme, which can be had on application to the secretary of the City and Guilds' Institute, Mercers' Hall, E.C., contains the syllabus of nearly all the twenty-six subjects, with the examination papers set in previous years for the technological examinations of the Society of Arts, so that the teachers and candidates have a guide as to what is required of them. We hope sincerely that workmen in all parts of the country will avail themselves of the opportunity to display the soundness of their knowledge, and we trust that employers will see the advantage of encouraging the movement, for once fairly started it will surely extend, and, with increase in the number of candidates, the "honours" paper may be made a more severe test, and the first prize be increased to something substantial.

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HORTON MANOR, BUCKINGHAMSHIRE.

HORTON is to John Milton what Stratford-upon-Avon is to Shakespeare, with this difference, that Shakespeare was born at Stratford, whereas Milton first saw the light in the City of London. His earliest studies and his first productions, however, took place at Horton; here he enriched his mind with the choicest stores of Grecian and Roman literature, and wrote his poems of "Comus," "L'Allegro," "Il Penseroso," and "Lycidas."

The local "Directory" says:—"Horton is a village in Stoke Hundred, diocese Oxford, stands in Middlesex and Buckinghamshire, divided by the river Colne. Rectory, £800 per annum—Rev. W. Browne, incumbent. Church is very old, Gothic architecture, and covered with ivy. In the garden of John Cooke, Esq., is an apple-tree planted by John Milton, under which he wrote some of his works. Population, 873. Acres, 1,340. T. P. Williams, Esq., is lord of the manor."

Lewis' "Topographical" says:—"The church contains a Norman doorway with circular arch enriched with mouldings, and is surrounded by a Roman wall. Milton's parents resided here, and his mother was interred here 1637."

Lyson's "Buckinghamshire" says:—"Horton, 1 mile south of Colnbrook. Manor formerly in the Windsor family for generations. In 1658 in the Scawens, who sold it in 1782. Now belongs to Williams's Manor-house, a large mansion pulled down, except a small part occupied by labourers. In church a heavy monument, no inscription, but belonging to one of the Seawen family, and a tomb of Milton's mother. The poet passed much of his young days here. Patron, Mr. Williams. Parish inclosed 1799, and an allotment made in lieu of tithes." Such are the "local" extracts.

Horton is situated between Colnbrook, Windsor, and Wraysbury; and in order to get to it from London you must alight at the Wraysbury station on the South-Western Railway. From the railway bridge here is a very good view of Windsor Castle. Horton is a mile and a half distant. The road leading to it, like all the roadways in the neighbourhood of Windsor Castle, is in splendid condition. We can only imagine what they may have been in Milton's time—possibly like Devonshire lanes, with huge boulders scattered along them; but such is not the case now; every road is as smooth as any to be found in any London suburban retreat, and with pretty pathways at the side. Horton church is not surrounded with ivy now. The walls, like those of Wraysbury Church, have all been "restored" into new ones. Fortunately, the Norman doorway, with its enriched chevron moulding, and the Roman boundary-wall are preserved. The bricks in this wall are of large size, different to those at Verulam.

Could any of your readers explain how these bricks came here? They are about twice the dimensions of our modern bricks. The manor house adjoining has been pulled down and rebuilt since the Williams family purchased it in 1782. It is in the modern Grecian Doric style. The present proprietor, Col. Williams, having leased it to Charles Taylor, Esq., of London, extensive alterations are being carried out in the erection of a new wing building, &c., from plans and under the superintendence of Mr. J. T. Lacey, architect, of 10, Buckingham-street, Strand, London; Mr. S. Hayworth, builder, of High-street, Kingsland, having undertaken the contract.

W. F. P.

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MR. CHAMBERLAIN ON RUSKIN'S "SEVEN LAMPS OF ARCHITECTURE."

ON Wednesday evening Mr. J. H. Chamberlain delivered the second of his three lectures on Dr. Ruskin's "Seven Lamps of Architecture," before the Royal Society of Artists, at Birmingham. There was a large attendance.—Mr. Chamberlain said he would not take up their time with recapitulation, but would at once ask their attention to some of the most urgent and important truths that were contained in Dr. Ruskin's book. He would not say very much about the first lamp—that of sacrifice—because he did not think it was the most important one; and without having any authority whatever for saying it, he should not wonder if, in the course of thirty years, Dr. Ruskin had a good deal modified his opinion with regard to some things he advanced then. But the principal matter that was contained in that lamp related really to religious art and to ecclesiastical architecture, and Dr. Ruskin's contention was that the church should be more beautiful than the house, and that it was the first duty of all persons to consider whether or not their houses were better than the churches, and whether they ought not to do the most they could to make the churches, on the contrary, better in all respects than the houses. During the past thirty years there had been a most wonderful change of opinion with regard to these matters. He remembered, in 1848 or 1849, a clergyman in a country village in Leicestershire doing some little repairs to his church, as clergymen were fond of doing, and putting up a modest stone cross on the gable; and the report immediately went through the adjoining parts of Leicestershire, at any rate, that the clergyman was turning Papist, that he was fast becoming a Puseyite, and was nothing more or less than a wolf in sheep's clothing. Since then churches had been built in a more magnificent and costly manner, and the contrast there was thirty years ago between the church and the squire's house no longer existed. Now probably the church was better in most respects than the house in which the squire dwelt; and they had learned to ornament their churches and to build them of precious materials without anyone being much frightened about it. Yet there were some things even now they dare not do. Thirty years ago there was an outcry against a cross being placed over the gable of a village church; and even now, when they restored a church and put niches in the wall they dare not put statues in the niches. Their good friend Mr. Chatwin, when he restored St. Martin's, and adorned the town in doing so, placed niches in the west wall, but if his memory served him aright, there were no statues in any of these up to that moment. There seemed to be an objection on the part of the public to churches being adorned with the chief glory of architecture—sculpture—and those who read the newspapers would know that this had been over and over again a bone of contention. Dr. Ruskin's Lamp of Truth, he remarked, was simply a plea for art being honest, and his Lamp of Beauty shed its light to guide them to the source from which that beauty sprang, and from which alone they derived any knowledge of it. This Lamp of Truth was very curious to read even now, and it was much more curious to read thirty years ago, because they found these words recurring constantly—"honest," "truth," "right," "wrong." It was the fashion of art critics then, as now, to deny that these things had anything at all to do with art; but he (Mr. Chamberlain) would say that these critics were wrong, and that architecture was based upon right, and could be very wrong indeed; that it could be true, and it could be honest; that it was often false and often dishonest. And looking at this matter from a point of view, personal to some extent, but yet embracing that which formed the life of a great many, he felt, and felt most strongly, that no honourable man should follow it, unless it could be based upon these considerations. Architecture was a reality, and must have some foundation; it must have something to rest upon. It had to deal with necessities; but if they regarded the necessities only with which they had to deal, it became mere building and engineering, and was not art. Engineering and building only rose to art when out of these very necessities the engineer could make beauty, and then he became an architect, but not before. To effect beauty required thought, and to erect an ugly building meant to banish thought. To illustrate this he contrasted the pyramids, built of enormous masses of stone—monuments of a dual despotism, the despotism of an autocratic king and priest—with a Mediæval cathedral such as that at Lichfield. Mr. Chamberlain divided the Lamp of Truth into three sections—truth of material, truth of structure, and truth of decoration—and spoke of the almost marvellous advance which had taken place of late years in these matters, and which improvement he attributed in a great measure to the supervision of the architects. By means of numerous charcoal sketches the lecturer explained the nature of Gothic designs, and said the round arch was the base, the beginning, end, and middle of all Gothic architecture. In conclusion, Mr. Chamberlain spoke of the Lamp of Beauty, and was warmly applauded upon resuming his seat.

FONTS OF WINCHESTER AND BRIDEKIRK.

THE beautiful font of Winchester early attracted my attention when I was a commoner of Wykeham's College, and I drank in that love of ancient art which is still an ever-fresh well-spring of pleasure.

I must not enter upon symbolism; but merely mention that three of the accessory sculptures partake clearly of that character: doves drinking from a cross-crowned vessel; doves eating grapes; doves flying from an evil beast.

1. Two women and a man, hawk on wrist, and holding a purse, approach a bishop, at whose feet is a kneeling figure, who is receiving a gift at his hands: a church stands behind the bishop.

2. A bishop stands holding a small figure by the hand; a headsman with an axe strikes at three heads, whose prostrate bodies are covered by a mantle. A third person is near the bishop.

3. A bishop rests his staff on a recumbent figure in water, who holds up a cup, which is grasped by the bishop. Above him appear parts of two other figures prostrate and raising up their hands.

4. Three men are in a ship without sails; one lays his arm helplessly over the tiller, a second is in deep grief, the third lifts up his hands.

Bishop Milner first suggested that these carvings represented the acts of St. Nicholas, of Myra, the patron of chorister boys. According to the legend of the Saints—now lying before me—the main facts seem to be:—

1. Shows the bishop, who had cast two pieces of gold into a needy nobleman's house, to save him from a deed of shame, in selling his daughter to a life of infamy.

2. During a rebellion, a consul ordered three innocent soldiers to be beheaded; he found them kneeling and blindfolded, with the sword uplifted above their heads. He tore the weapon out of the lictor's hands, and released them. Nepotian, Ursus, and Argulis, the Imperial envoys, having crushed the affair without blood, received his blessing, and were afterwards rescued by him when accused of treason to the Emperor for their merciful conduct.

3. A boy carrying a golden cup to the altar of St. Nicholas' church, was drowned at sea, but was restored to his father, to the amazement of the spectators.

4. The bishop succouring shipmen of Alexandria in a storm in the gulf of Adria.

There are apparent discrepancies between the sculpture and the legend, which might be reconciled if we only possessed the version of the story which prevailed when the carver was at work.

The font of Bridekirk bears an inscription in Runes: a man eating grapes; a sculptor with mallet and chisel at work on a scroll; grotesque, a centaur battling with monsters, foliage; (1) the Baptism of our Blessed Lord in the fords of Jordan; (2) a woman clothed in a mantle kneeling and clasping a tree; a man in a cap and short cloak looking back, and a figure holding up a sword and beckoning with the finger. It may be the Expulsion from Paradise.—I am, &c.,

Mackenzie E. C. Walcott.

SPECIFICATIONS FOR PLUMBING.

A LETTER in a recent number of *The* (American) *Plumber and Sanitary Engineer*, complaining about difficulty of estimating on vague and indefinite specifications, induces a correspondent of that journal to call the attention of architects to the importance of fulness and explicitness in specifications for plumbing work. So long as the custom of asking competitive estimates continues, so long will the temptation exist to interpret the architect's expressions so as to allow cheapening the job, thus giving an advantage to unscrupulous men when it should be with those who incline to make all work the very best of its kind.

When a plumber is used to working for an architect he becomes familiar with his wishes and ideas, and learns just what is meant by general description of the plumbing in a house, and if the work is to be done on a percentage or an estimate made not in competition, full details are not so necessary; but in all cases of competition, and especially where plumbers are not familiar with the architect's views of details, the greatest fullness and explicitness is necessary to prevent injustice to plumbers, to secure the best work, and to save no end of annoyance to the architect himself. This should be the case in plans as well as specifications.

I often estimate for work where the kind of pipe is not named; the weight of copper in bath tubs not given; where "the wash trays will be of soap-stone and fitted up complete in the usual way;" when no reference is made to ventilation, or if any, no plan given. One architect always has the formula, "Supply pipes, 1in., strong; waste pipes, 1in., medium;" and I look in vain for anything more definite—he does not mean what he says, nor say what he means—how can a stranger conform to this? How unjust to compare estimates made under such conditions! Of course the owner gets the cheapest work that can be construed into conformity with the specifications.

The architect adds greatly to his annoyance and trouble. Even with the fullest details given, he cannot see until the work is being done whether it is properly done, and then, if not right, it must be taken down, often to the injury of the building and anger of carpenters, &c. He adds very much to the danger of this by inadequate specifications and plans, and also raises the question of how the work is to be done, and he often finds he cannot enforce a compliance with what he intended because he has not expressed it.

Architects will find it a great help to have a certain form of specification and fill up as the peculiarities of each building require—something in this way: first, name the number of each fixture to be placed in the building; second, describe in detail, size, weight, material, &c., of each kind of fixture; third, the supply system, giving size, kind, location, mode of fastening, number and position of stop-cocks, &c.; fourth, the drainage system, giving full plan of ventilation, size, material, kind of trap, mode of working joints, and connections of one kind of pipe with another, &c. There is need of more care in these respects with almost every architect I meet, and no doubt it is so in all places.

ANDERTON'S HOTEL, FLEET STREET.

ANDERTON'S Hotel, one of the oldest establishments of its kind in the metropolis, and which possesses an exceptional history, is being rebuilt, the new structure being a prominent architectural feature in Fleet-street. The frontage is about 50ft. in width, and between 80 and 90ft. in height, and is carried to a depth of nearly 100ft., much valuable property adjoining having been purchased for the new and enlarged building. The Fleet-street elevation, which contains four stories above the ground-floor, is built with red patent brick, and massive Portland stone dressings, a profusion of ornamental work in terra-cotta being introduced in various portions of the façade. The east and west sides of the elevation are surmounted by crescent-formed gables, and one of the most prominent features is a bold balustrade and balcony in Portland stone, which is carried across the elevation at the foot of the first-floor windows. The grand entrance to the hotel is in the centre of the ground-floor, consisting of shops on each side, unconnected with the hotel itself. The entrance is 10ft. in width, flanked on each side with Aberdeen polished granite, from which springs an archway of the same material. The entrance leads into a handsome corridor 15ft. in width, and upwards of 20ft. in length, which is laid with ornamental encaustic tiles. From this corridor the several apartments of the hotel are approached, the upper portions by a grand staircase 7ft. in width. The capacity of the interior of the building will be imagined when it is stated that in addition to numerous reception, coffee, and dining-rooms, there are no less than 120 bed-rooms. A special feature consists of a spacious Masonic lodge-room at the rear of the first floor, which is magnificently decorated, and the windows of which are all in stained glass, containing Masonic emblems. In the basement there is also a fine Masonic banqueting-hall, in which 500 persons can dine. The floors of the lower portions of the building are all fire-proof, and as a large and valuable quantity of plate will be permanently deposited in the hotel, not only belonging to the hotel itself, but also to Masonic lodges, several large safes have been furnished by the Milner's Safe Manufacturing Company. The architects are Messrs. Ford and Hesketh, and the builders Messrs. Brown and Robinson. The cost of the building will be upwards of £60,000.

THE LIVERPOOL ENGINEERING SOCIETY.

THE eighty-third meeting of this society was held at the Royal Institution, Colquit-street, on Wednesday evening, the 8th inst., Mr. M. E. Yeatman, M.A. president, in the chair. A paper on "Cast Iron for Engineering Purposes" was read by Mr. John S. Brodie, M. Inst. M.E.

In a brief introductory historical sketch, reference was made to Smeaton, Savory, Newcomer, Murdoch, and others, who were among the first to make use of cast iron for bridges, machinery, &c.; but it was shown that, until the time of the valuable experiments of Messrs. Fairbairn and Hodgkinson in 1827 to 1829, comparatively little progress was made in the application of iron castings for large structures. Those experiments, together with the subsequent experiments of Mr. Hodgkinson made in 1849, at the request of the Royal Commission on Railway Structures, were shown to have been the starting-point for the extensive application of the material for columns, short-span girders, &c., now in such general use. The different kinds of pig-iron were then explained, and their suitability for various purposes reviewed. The strength, elasticity, ductility, &c., of cast iron, with methods of practical testing, were dealt with in detail, and the results arrived at by different experimenters reduced to common values and compared. Methods of preserving the surface of cast iron having been enumerated and explained, instances were then given of recent successful applications of the material for bridge-work, columns, piles for foundations, &c., and the paper was concluded by a review of the future prospects of cast iron, in which it was stated that where high compressive strength and economy were required it would always be preferred to wrought iron or steel.

CHIPS.

In the *London Gazette* of Tuesday the dissolutions of the partnership existing between Alexander and Henman, 96, High-street, Stockton-on-Tees, and Post-office Chambers, Middlesborough, architects and surveyors, and between Thomas Royce Lysaght and Thomas Jones Scoones, Royal Insurance-buildings, Corn-street, Bristol, also architects and surveyors, are announced.

For a proposed new pier to be built at St. Anne's-on-the-Sea about a dozen tenders have been received by the secretary of the St. Anne's Land and Building Company. The plans have been prepared by Mr. Dowson, of Westminster, and show a structure 1,145ft. in length, and varying in width from 21ft. to 100ft. A landing-stage is provided for steamers, and the work will probably be executed next spring.

OUR COMMONPLACE COLUMN.

IONIC (ADDITIONAL NOTES).

MR. FERGUSSON, speaking of the architecture of Asia Minor, says:—"The Ionic order, for instance, which arose in the Grecian colonies on the coast, is only the native style of this country Doricised, if the expression may be used. In other words, the local method of building had become so modified and altered by the Greeks in adapting it to the Doric, which had become the typical style with them, as to lose almost all its original Asiatic forms. It thus became essentially a stone architecture, with external columns, instead of a style indulging only in wooden pillars and those used internally, as there is every reason to suppose was the earlier form of the art." ("Handbook of Architecture," I., p. 212; see also pp. 265 and 271). The chief characteristic of the Ionic order is symmetry. It has been aptly compared to Lyric poetry—there is a certain individualism in it, just as in the lyric strains of Sappho, Anacreon, and Pindar. Palladio, speaking of this order, says, "It had its origin in Ionia, a province of Asia; and we read that the famous temple of Diana at Ephesus was built of that order. The column, with its capital and base, is nine modules high; and by a module is understood the diameter of a column below. The architrave, frieze, or cornice, have the fifth part of the height of the column. When the columns are single, the intercolumns are of two diameters and a fourth part, and this is the most beautiful and commodious manner of all intercolumns, which Vitruvius calls Eustylos" (quoted in Weale's "Dictionary of Architectural Terms.") We may refer the reader to Westropp's "Archæology," p. 61, &c., BUILDING NEWS, 1879, p. 502, and to Leeds' "Orders" (wherein is an amusing invective against Mr. Ruskin concerning the Ionic order.)

C. F. W.

IRONWORK.

"OF the ironwork of the Middle Ages," says Parker, in his Glossary, "connected with architecture, we have not very numerous specimens remaining in this country, although sufficient to show the care that was bestowed upon it; some of the earliest and most ornamental kind is being exhibited in the hinges and scrollwork on doors." M. V.-le-Duc, in his Dict. Rais., tells us that in France, in the Romanesque era, certain provinces were celebrated for their product of wrought iron or ironwork; notably the provinces of Berry and Dauphiny. The working of iron, however, suffered much during the 5th and 6th centuries on account of frequent invasions. At length the monastic establishments took it up, and by degrees brough [illegible] a high state of perfection; this was in the 12th century. The means for working were small, and the use of the hand was, of course, much greater than nowadays, and it is to this instrument that we must assign much of the delicacy and sharpness in old ironwork that is not to be found in modern. (See under *Serrurerie* and *Grille*). Consult Heffner Alteneck's "Serrurerie du Moyen Age" and Bordeaux's work; BUILDING NEWS, 1878 (2), p. 318; 1879, p. 600, 613. For strength of columns, weight, &c., refer to Intercommunication columns of back volumes. C. F. W.

ITALIAN ARCHITECTURE.

THE Italian may be termed the revived Roman style; chronologically the style followed the Pointed style, though it had no feeling or affinity for it. Italian architecture, however, was formed without reference to the existing specimens of Greece and Rome, and was based on the dogmas of an obscure Roman author, Vitruvius, who has been much misinterpreted by the translators of his text. Vitruvius described four classes of orders of columnar composition, and these were subjected to fixed rules. A fifth order, a mixture of two of his, was added, and the school of Italian revivers soon systematised everything, and laid down laws of proportions for every part of the order. These rules are much relaxed nowadays, and the school of Italian architects adopt their own proportions, and are so far eclectics that they do not rigidly bind themselves to adhere to Classical composition. Hence many of our Anglo-Italian buildings exhibit Gothicised features. Palladio, Vignola, Michael Angelo were great masters of the Italo-Vitruvian school. Sir Charles Barry was one of the foremost to revive the true principles of Italian architecture during this century. Consult Fergusson's Handbook II., Book VI., p. 764; "History of Modern Architecture:" Eccles., pp. 39—80, Secular, 82—130; Prof. Barry's "Lectures at Royal Academy," reported in our last volume (1879); Weale's "Dictionary of Terms," Mr. Ruskin's "Stones of Venice," "St. Mark's Rest," and "Mornings in Florence."

IVORIES.

A TERM used for works of arts executed in ivory, statuettes, diptychs, boxes ("houses of ivory"), &c. "No works known to us from the hand of man can claim so high an antiquity, and, except some rude implements, none more high than carvings in ivory and bone. They have been found in the cave-dwellings of people who lived when the reindeer and the mammoth ranged over the plains of southern Europe. Incised sketches and carvings in low relief of various beasts prove to us that thousands of years ago men possessed the power of representing what they saw with the right feeling and in an artistic spirit." From the tombs of Egypt we have gathered many specimens of ivory-work, chairs inlaid, daggers, handle of mirror, palette, &c. The British Museum contains valuable specimens of Assyrian ivories, found at Nineveh; they belong probably to the 11th—6th century B.C. Passing to Greece, we find references to ivory-work in Homer and Hesiod, chiefly to domestic articles. Of chryselephantine works, the Minerva of the Parthenon and the Jupiter of Olympia were the most noteworthy: the former was nearly 40ft. high, and the latter over 50ft. "The faces and the uncovered parts of the bodies of these colossal statues were made of large plaques of ivory, carefully joined." We must thank the Christian iconoclast for the wholesale destruction of many of these fine ivory statues. We have a few specimens of Etruscan work preserved in the British Museum; Roman works are also scarce. "From the middle of the fourth century downwards we have an unbroken chain of examples still existing, and we can point to carved ivories of every century, in gradually increasing numbers, which may be seen in museums in England and abroad. Their importance with reference to the history of art cannot be overrated, there is no such chain in manuscripts, or mosaics, or textiles, or gems, or enamels." (See "Ivory" in "The Industrial Arts," Council of Education.) "There was a continued succession," says the Rev. R. St. J. Tyrwhitt in "The Basilica" (Part IX.), "of what were called diptychs, imperial and consular. These were folding ivory tablets, two-leaved in the first instance, with wax for writing on the inside, and carved on the outer side in low relief, generally from 12 to 15in. high by 5 or 6 in breadth. It had long been the custom for consuls, prætors, ædiles, and other magistrates, to make presents of such tokens to their friends on taking office. The diptych bore the name and titles of the official, whoever he was, and on such twofold tablets, in a Christian church, were written names of Christians living and dead, which were read out during Holy Communion." Speaking of Byzantine and early Gothic ivory carvings, the same author says:—"Beauty was for a time considered an evil. Weariness of the visible world of nature had set in, and in such symbolic art as was possible for the monkhood, something like a religious pursuit of ugliness may be traced in mosaics and MSS. One cannot draw or colour without study from nature, or study nature if one believes her wholly accursed." These words are pregnant with truth, and we must draw the attention of the reader to Mr. Tyrwhitt's admirable series of papers on "Christian Architecture and Art," appearing in the *Monthly Packet*. The author recommends those interested in chryselephantine sculpture to study Quatremère de Quincy's work on the statue of the Olympian Zeus. He tells us that "Professor Westwood, of Oxford, is the only, or the chief person in this country who has systematically, and on a large scale, collected, catalogued, and described ivory carvings, as specimens of art and documents of history. Consult the professor's 'Notes on early Christian Sculptures and Ivory Carvings.' We cannot here go into detail, but must merely mention that Biblical stories and profane legends formed the chief subject of panel-carving. Caskets, coffers, mirror-cases, combs, chessmen, arms of chairs, croziers, pastoral staffs, horns are some of the objects made of or inlaid with ivory, and all of which were more or less carved." The Vatican collection (of ivories) is the largest in the world. The British South Kensington and Liverpool Museums are also rich in them. We must commend to the notice of the student Cahier et Martin's "Nouveaux Mélanges d'Archeolgie," Vol. II., Edouard Lièvre's "Arts Decoratifs," Rohault de Fleury's "L'Evangile," Dr. Ruskin's works, and Smith's "Dict. of Christ. Antiq." For the practice of ivory carving, see Fairholt's "Dict. of Art. Terms," art. Ivory. See Flaxman's "Lects. on Sculpture," pp. 91, 228, and Westropp's "Archæology," p. 164.

C. F. W.

CHIPS.

The roof of the new Drill Hall, Sheffield, 11,000ft. in area, is glazed with Helliwell's patent system of glazing without putty.

The opening meeting of the session of the Society of Medical Officers of Health will be held at 1, Adam-street, Adelphi, this (Friday) evening at 8 p.m., when the president, Dr. J. S. Bristowe, will deliver an address.

The local board of health for Dartford recently met to consider revised tenders for the sewering of the town, and accepted the lowest, that of Mr. Stevenson, at £22,641.

A new church at Water Orton, built at a cost of £3,500, was consecrated on Tuesday by the Bishop of Worcester. The metal work, &c., was supplied by Messrs. Jones and Willis, of London and Birmingham.

New schools are about to be erected by the Wednesbury School Board in Lower High-street, at an estimated cost for buildings and site of £5,772. The contractor is Mr. J. Widdowson, of Saltley.

New abattoirs are being built for the Cardiff town council at Roath and Ashton, from the plans of Mr. Williams, borough engineer, and will be opened on the 1st prox. The cost has been £12,000.

During the past week two additional memorial stained-glass windows have been placed in the parish church, Cheltenham. That on the south side has been executed by Messrs. Clayton and Bell, London, and the subject is taken from Ephesians vi. 14—17. That on the north side is the work of Messrs. Bell and Son, of Bristol, and the subjects are the Call of the Disciples and the Miraculous Draught of Fishes.

The winter promises to be a busy season at the new watering-place of Skegness-on-Sea. At a meeting held there on Tuesday week a tender of £12,000 was accepted for the construction of a pier to extend 600 yards from the bank, and to be completed by June 1st, 1880. The new local board and other offices erected in this town by the Earl of Scarborough were opened last week. The work at the new church is being pushed forward, and the memorial-stone is to be laid on the 4th prox. Day-schools for 268 children are being built from the designs of Mr. J. Witton, by Mr. G. Dunkley, who took the contract at £1,370. A cricket pavilion is about to be built by Mr. S. Clarke, contractor, at a cost of £500; an ornamental fountain, with five lamps, is being put up on a triangular piece of ground opposite the railway-station. A temporary Fishermen's Orphan Home is to be opened next week; the contract for furnishing is in the hands of Messrs: Dunkley and Hildred. A large terrace is about to be erected at the corner of Drummond-road, and many blocks of buildings are being raised.

The first of a series of lectures on archæology, under the Rhind Foundation, was delivered on Tuesday at Edinburgh, by Mr. Joseph Anderson, keeper of the Antiquarian Museum. In introducing the subject of his course, which is "Scotland in Early Christian Times," Mr. Anderson discussed the means of obtaining a scientific basis for Scottish archæology, indicating what constituted the materials of the science, and pointing out how these were to be used.

A return has been issued showing that the number of building societies in England and Wales incorporated under the Building Societies Acts, 1874 and 1875, up to the 31st December, 1878, was 987, of which 826 have furnished statements of their annual income; and 830 of their liabilities and assets. The total number of members of 767 societies was 275,450; the liabilities (of 830 societies) £28,248,005, and the assets £28,228,1[illegible]3, leaving a balance deficient in 129 societies of £19,852.

The Glamorganshire magistrates, at Monday's Quarter Sessions, agreed to permit Mr. Barber to discharge the duties of county surveyor in place of Mr. Bassett, during the winter months. It was also decided to construct two new filtration beds and make other improvements to the water-supply of the County Lunatic Asylum, near Bridgend, at an estimated cost of £800.

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ILLUSTRATIONS.

FIRTH COLLEGE, SCHOOL BOARD OFFICES, AND CENTRAL SCHOOLS, SHEFFIELD.—ST. JAMES'S CHURCH, WESTMORELAND-STREET, MARYLEBONE.—SMALL VILLA AT DULWICH.—SKETCHES OF MEDIÆVAL IRONWORK.

OUR LITHOGRAPHIC ILLUSTRATIONS.

THE FIRTH COLLEGE, SCHOOL BOARD OFFICES, AND CENTRAL SCHOOLS, SHEFFIELD.

The Firth College, Sheffield, which we illustrate this week, is to be opened on Monday next by Prince Leopold. Internally, the building contains on the principal floor a hall for lectures on literature and other popular subjects, measuring 60ft. by 40ft., extending through two stories, surrounded on three sides by galleries, and lighted from the ceiling. Also a large room, especially adapted for lectures on physics or chemistry, which, being fitted in the most approved lecture-room fashion, extends downwards to the basement, and is provided with revolving shutters so as to obtain darkness during experiments, &c. On the first floor the portion not occupied by the upper part of the hall is devoted to lecture-rooms and class-rooms. In the basement are the necessary offices, the heating apparatus, kitchen, &c. In the entrance hall, and opposite the outer door, stands the bust of Mr. Firth, from the chisel of Mr. Bruce Joy, which forms a portion of a testimonial presented to the donor of the College, Mr. Mark Firth, and was exhibited at the Royal Academy during the present year. This hall is fitted with swing doors, and has a groined ceiling. Externally, it forms one of a large group, consisting of the College, the School Board offices, and the great Central School, all designed by the same architects, Mr. T. J. Flockton, of Sheffield, and Mr. E. R. Robson, F.S.A., of Parliament-street, London. The key-note of the style is said to have been given by Clare College, Cambridge, but the whole is treated with great freedom, and without any subservient imitation of the prototype. It has been found exceedingly difficult to group three such wholly different buildings into one harmonious whole, and a close observer will notice that the detail of the Firth College is slightly enlarged throughout, in consequence of the greater height of its stories, over that followed on the other buildings. The foliage sculpture has been executed by Mr. J. M'Culloch, of London, while the tympana over the arched doorway forming the principal entrance to the College, and respectively representing "Science" and "Art," are from the chisel of Mr. Onslow Ford, of Blackheath. The clerk of works employed by Mr. Firth was Mr. Laidler. The whole of the work has been executed by Mr. Wm. Bissett, builder, Sheffield.

ST. JAMES'S CHURCH, WESTMORELAND-STREET.

The church of St. James, Marylebone, is a plain structure of Italian architecture, of which the most interesting feature, perhaps, is the roof, the construction of which is a good specimen of the carpentry of its day. The façade, which is stuccoed, has long been in bad order. The design, of which we give an illustration, was prepared some time back by Mr. Gilbert Scott to replace the present dilapidated front. The style of the building, such as it is, determined the style of the design, the principal motive of which was to connect the façade of the chapel with the houses upon either side of it, so that it should form a portion of the general street frontage, while at the same time it should be sufficiently marked out from the houses adjoining it by the character of its elevation. Westmoreland-street is a short street, and the façade of St. James' church occupies about the centre of its length, looking directly down a cross street of some width. The situation is thus architecturally a very good one, as the church forms, or rather might form if properly treated, the commanding feature of the whole street. The design includes a clock-face and provision for a chime of eight bells in connection with the clock, the larger bells being available also for ringing.

ST. PETER'S, THURLOW-HILL.

The illustration shows a small detached villa, erected for Mr. Michael Pope, on the highest point of Thurlow-hill, Dulwich. The facings are of stock brick and the dressings of red brick. The roof and sides are tiled. The figure of St. Peter and the panels, which are of terra-cotta, were supplied by Messrs. Cooper and Son, of Maidenhead. The figure was executed from a cartoon prepared by Mr. William Penstone. The works have been executed by Messrs. Lathey Bros., of Battersea, under the superintendence of the architects, Messrs. Batterbury and Huxley, 25, Great James-street, Bedford-row, W.C.

ROYAL ARCHITECTURAL MUSEUM SKETCHING CLUB. MEDIÆVAL IRONWORK.

Continuing our series of drawings by members of this club, which has just commenced its second session, we publish to-day a sheet of very interesting examples of ironwork, sketched from examples and casts in the Museum. The "real size" on the plate should have been removed in the lithograph, as it refers to the scale of the subjects on the original drawing. As here reduced, the scale may be reckoned at about half full size. The subjects explain themselves, and cannot fail to be suggestive. Mr. H. Phelps Drew is the author of the drawings. Our next illustration in connection with the club will comprise some sketches made during the club's sketching excursions this summer made on Saturday afternoons.

COMPETITIONS.

Bootle.—At a meeting of the Bootle Town Council last week, it was reported that the plans sent in for the erection of a new Town-hall had been carefully examined by the General Purposes Committee, and out of the entire number, nine had been selected and submitted to a special meeting of the Town Council. The services of an architect of position and standing in the City of Edinburgh had also been obtained to inspect and report upon these selected plans, and in his report he stated that the selection of the Committee was most admirable, in respect to satisfying every requirement of Bootle, but he doubted whether a town-hall could be built according to any of the plans at a cost of £6,000. Alderman H. Musker moved the following resolution:—"That this Council award the first premium of £50 to the author of the design for the new Town-hall (placed first by the architect), and the second premium of £25 to the author of the plan (placed second by the architect), subject to the authors respectively presenting tenders from builders to carry out the work for the sum prescribed in the conditions. That in the event of the authors being unable to submit satisfactory tenders as regards costs, the committee be empowered to communicate with the authors of other plans in the order of merit placed by the architect, and provided their tenders be satisfactory, to award the premiums accordingly." Alderman Heintz seconded the motion. Councillor Cox asked some questions with respect to the cost of producing a town-hall from the selected plans. Councillor Leslie expressed an opinion that it would be unjust to the other competitors to pay the premiums over to the authors of any plans the carrying out of which would greatly exceed £6,000. The motion was ultimately carried.

Hagley-road Chapel, Birmingham.—Five architects submitted designs in limited competition for the above, and Mr. J. Cubitt's design has been accepted. It comprises a central area, with a lantern tower, and will seat about 1,000 people. The site is an excellent one, in the best part of Birmingham.

Halifax —The Halifax town council on Monday accepted the plans signed "Pro Publico," submitted in competition for a lodge to be built in Savile Park. The name of the architect is Mr. John T. Henson, Sherwood Rise, Nottingham.

Ipswich New Corn Exchange.—The *Bury and Suffolk Standard* of Wednesday says:—"The Corn Exchange Committee have decided to recommend to the Town Council the adoption of the design signed 'North Light,' which is understood to be by an Ipswich architect. It will be a large and handsome building with a perfectly clear floor, *i.e.*, without arcades or pillars, the roof being spanned by an ironwork arch. The architect's estimate is £17,848; but it is considered doubtful whether the building can be erected for that sum."

CHIPS.

Gwyddelwern parish church, for which the claim is set up by a Wrexham journal of being the most dilapidated church in the diocese of St. Asaph, is about to be extensively restored from the designs of Mr. Henry Kennedy, of Bangor. A spire is now being added to it at the expense of the Hon. C. H. Wynne, of Rûg; the work is being carried out by Mr. Wm. E. Samuel, of Wrexham.

The workmen in the employ of Messrs. William Smith and Sons, contractors, of Guildford, were entertained at supper on Saturday week in celebration of the completion by the firm of a new draper's showroom, 95ft. by 17ft., in High-street.

A meeting was held at Leytonstone last week to consider what steps should be taken to increase the church accommodation. Plans prepared by Mr. Blomfield were exhibited, showing an increase of sittings in the present church from 500 to 850, estimated to cost £4,500; and it was resolved to instruct Mr. Blomfield to prepare plans for a new church.

The memorial stone of a new English Congregational chapel was laid at Northop, half-way between Flint and Mold, on Wednesday week. The chapel will seat 100 persons, and will cost £390; the walls are hollow, and of red brick, joined at intervals by 3in. blue tiles. Mr. Isaac Aydon, of Mold, is the architect, and Mr. William Davies, of Mold, the contractor.

The annual distribution of Queen's prizes and certificates to the students of the Godalming science and art classes, took place on Thursday, the 9th inst., at the public hall. A vote of thanks was passed to Mr. Nevill, who is retiring from the art classes, for the work he has carried on. Mr. Pewtress will take his place.

The foundation stone of new schools in course of erection at Denton Holme, by the Carlisle school board, was laid on Tuesday week. The buildings will accommodate 216 boys, 253 girls, and 436 infants, in all 905 children. The total contracts for erection have been let at £4,663 4s., and the site, 3,670 square yards, cost £1,178 2s. 6d. Mr. D. Birkett is the architect; the chief contracts are those for masonry and brickwork, taken by Mr. C. Armstrong, at £2,194 14s., and for joinery, Messrs. Batley and Foster, at £1,331.

Mr. H. Curtis Card, of Lewes, has written to us, contradicting the statement which appeared last week on p. 428, that Lewes was about to be drained under his instructions and supervision as borough surveyor. Our authority was a daily contemporary.

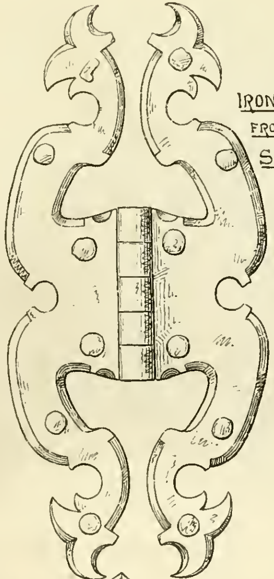
The Trevethin School Board, Mon., have instructed their architect, Mr. E. A. Lansdowne, to prepare plans for schools to accommodate 300 children, with master's house, all offices, and boundary walls.

The 500th anniversary of the foundation, by William of Wykeham, of New College, Oxford, was celebrated on Tuesday, when the college chapel, which has been renovated at a cost of upwards of £20,000, was reopened. The chapel of New College has been thoroughly renovated, from the designs of the late Sir George Gilbert Scott, by Mr. Shaw, of London.

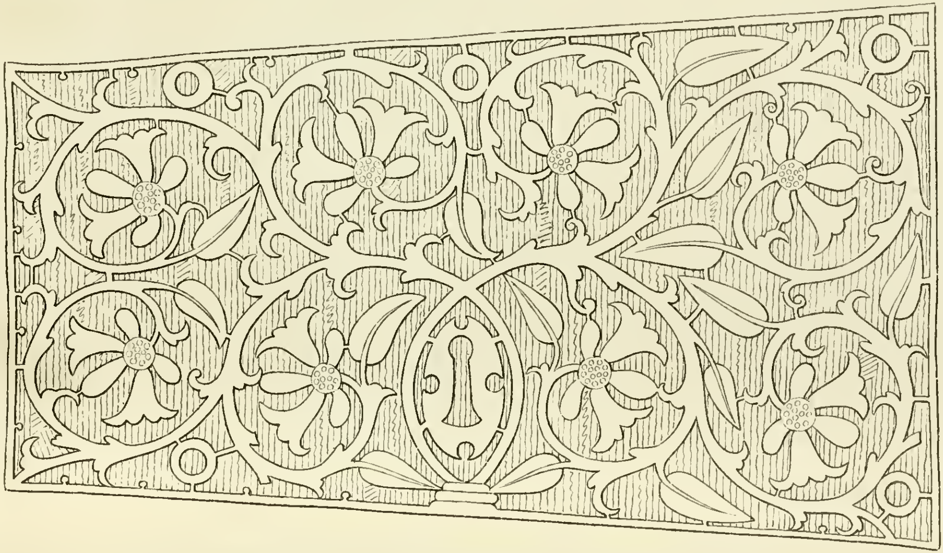
ROYAL ARCHITECTURAL MUSEUM SKETCHING CLUB.

MEDIÆVAL IRONWORK

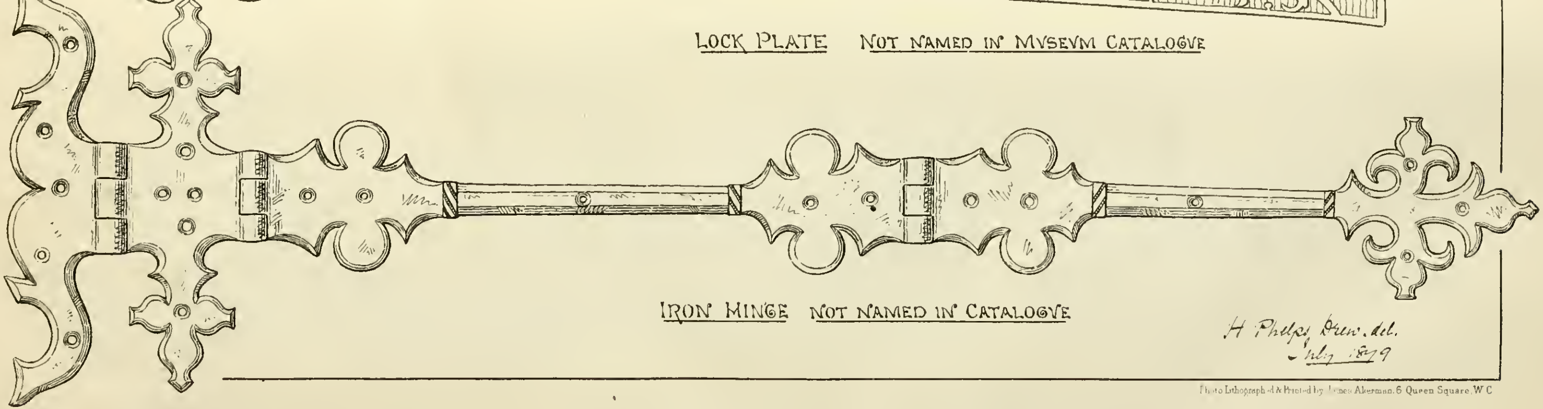
REAL SIZE



IRON HINGE FROM SALISBURY CATHL.



LOCK PLATE NOT NAMED IN MUSEUM CATALOGUE



IRON HINGE NOT NAMED IN CATALOGUE

H Phelps Drew. del.
July 1879

Photo Lithographed & Printed by James Akerman. 6 Queen Square, W C

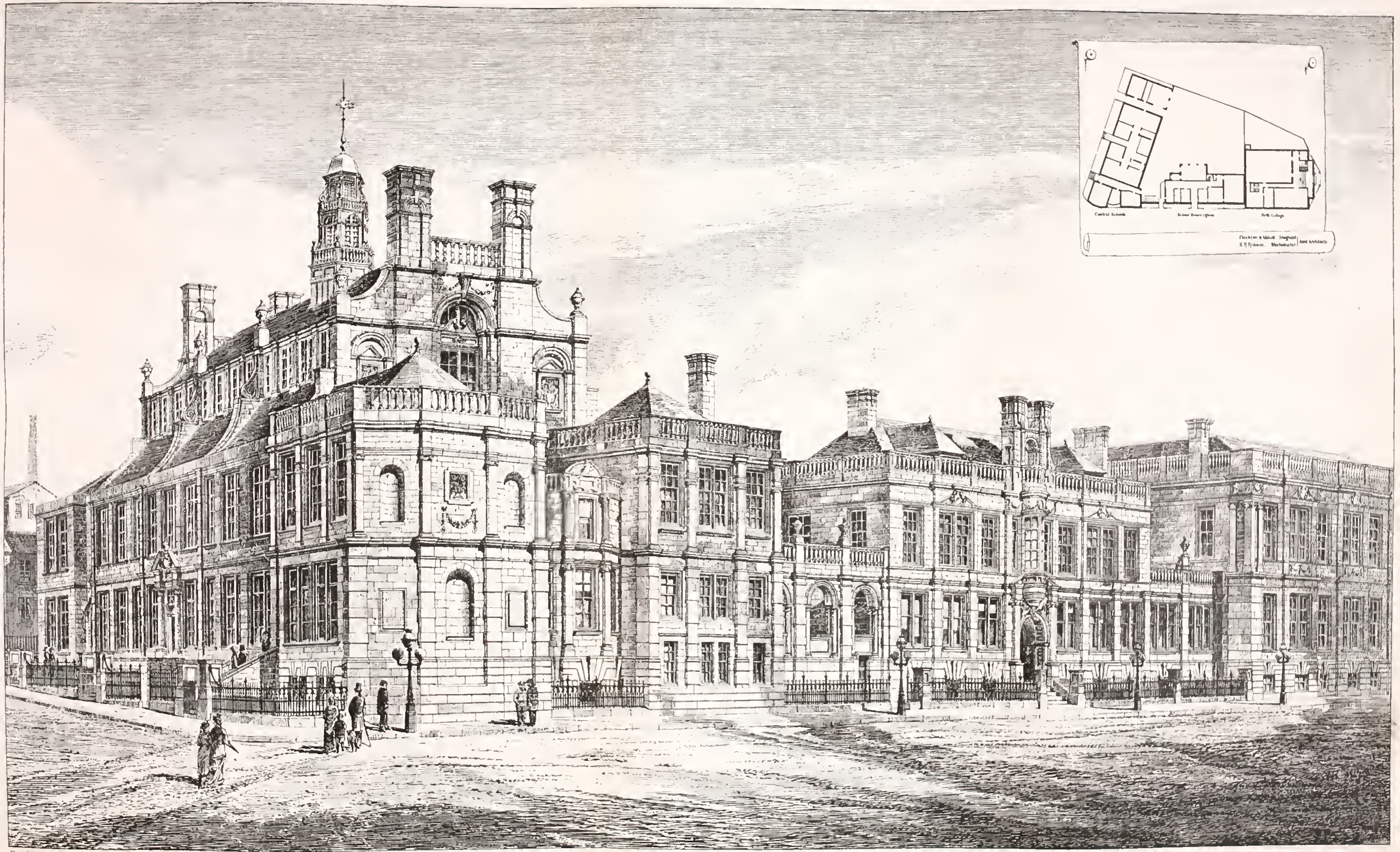


Photo lith graphed & Printed by James Akerman, 6, Queen Square, W.C.

FIRTH COLLEGE, SCHOOL BOARD OFFICES AND CENTRAL SCHOOLS, SHEFFIELD. FLOCKTON & ABBOTT AND E. R. ROBSON, JOINT ARCHITECTS.

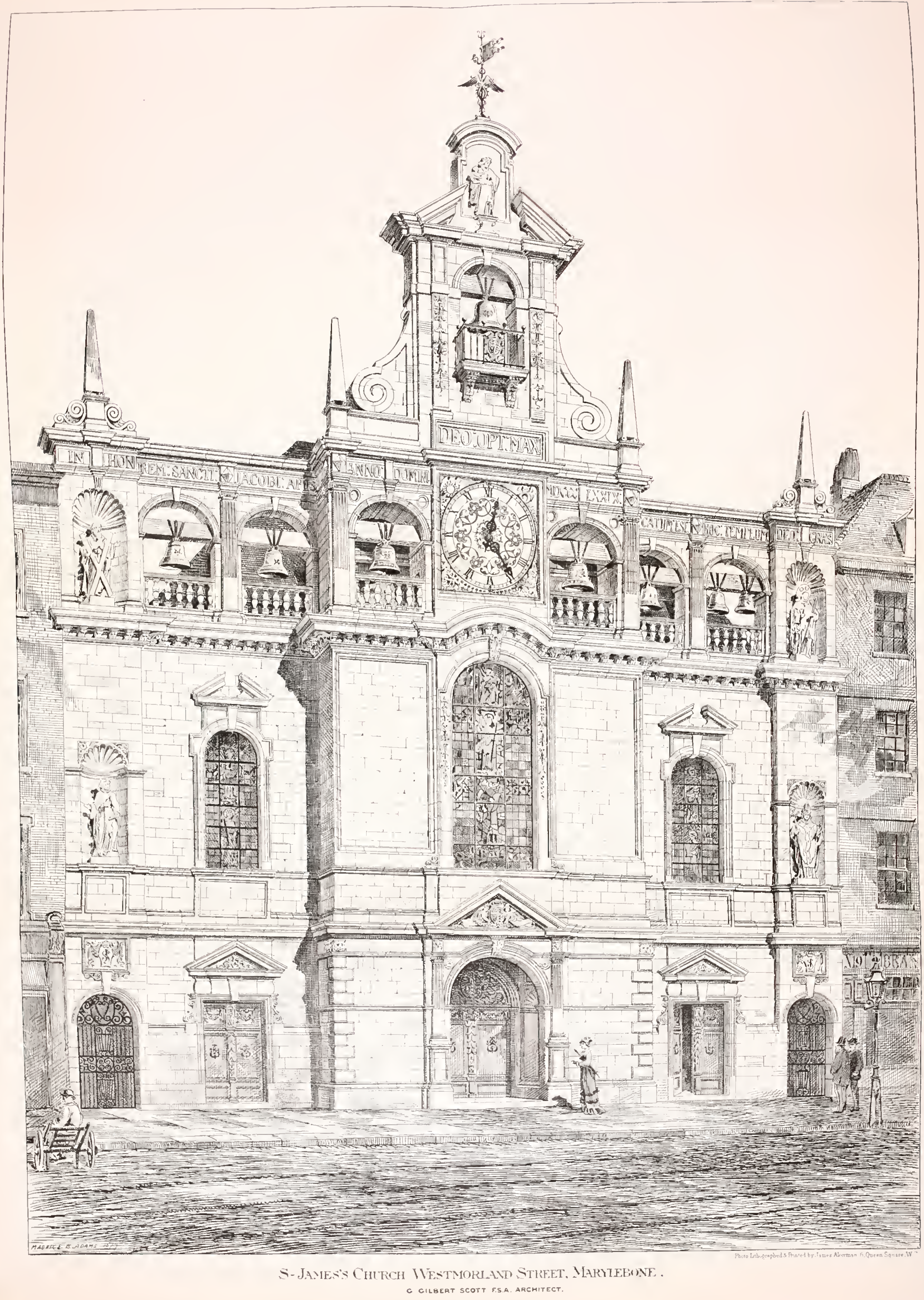
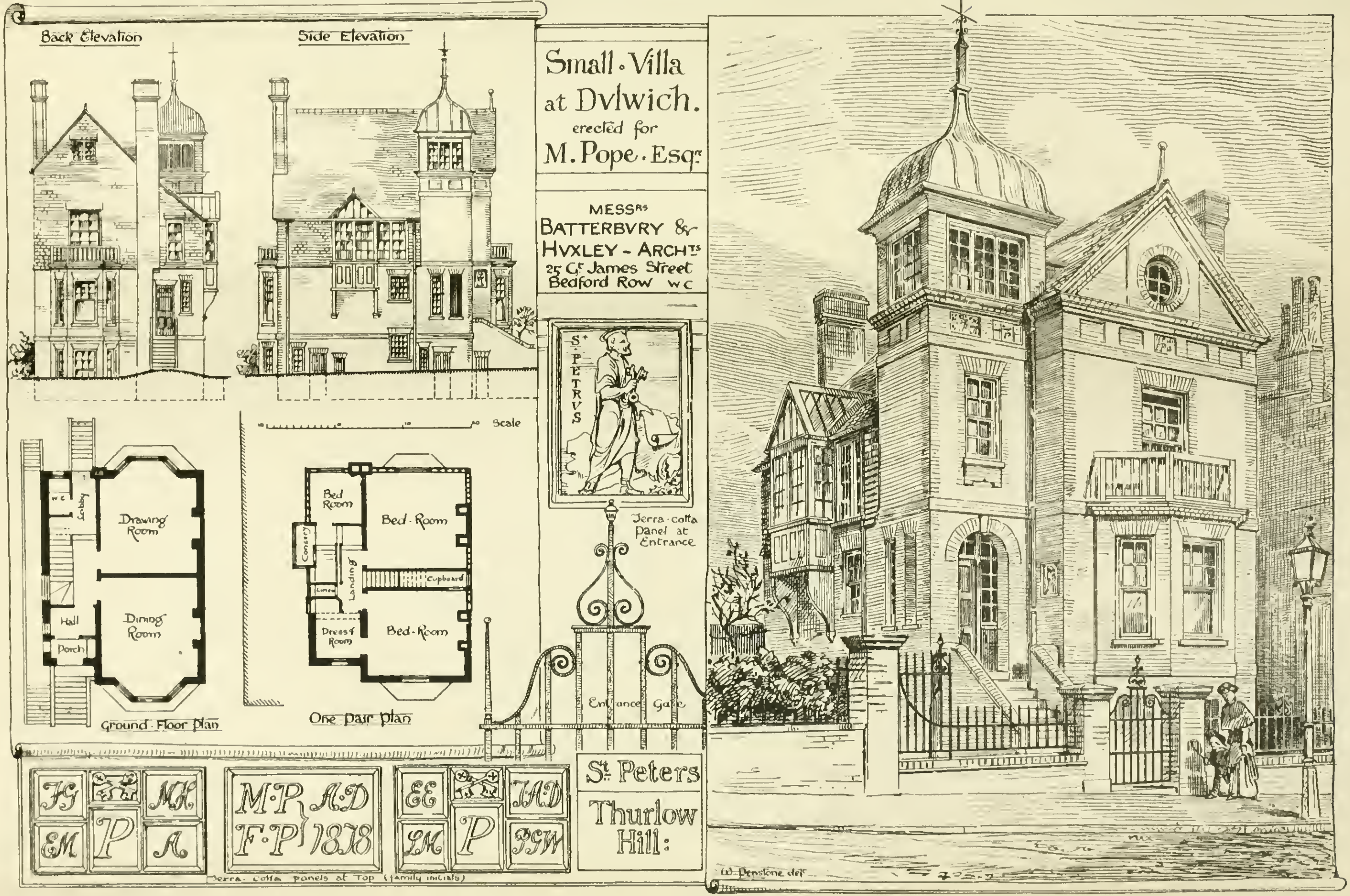

IN HONOREM. SANCTI JACOBI. APOS ANNO DOMINI MDCCCLXXIX
DEO. OPT. MAX
CAPUT EST HOC TEMPLUM DEO GRAS
MAURICE B. ADAMS

Photo Lithographed & Printed by James Akerman 6, Queen Square, W.C.

S. JAMES'S CHURCH WESTMORLAND STREET, MARYLEBONE.

G. GILBERT SCOTT F.S.A. ARCHITECT.



Small · Villa at Dulwich. erected for M. Pope. Esqr

Messrs Batterbury & Huxley - Archts 25 Gt James Street Bedford Row W C

Photo Lithographed & Printed by James Akerman, 6, Queen Square. W.C

ALBERT DÜRER.

THOSE readers—and we know they are many—who value the reproductions of the works of Albert Dürer we have been able to give from time to time in this journal, will read with interest an able article on the great German artist in the current *Quarterly Review*,[*] from which we extract the following. We are glad to note a statement made by the writer at the end of the article that an English translation of Thausing's "Life of Dürer" is in progress, and will probably be published before the end of the year.

It was, says the writer in the *Quarterly Review*, on his return from his "Wanderjahre" that Albert Dürer began his series of large subjects from the Apocalypse. The feelings which led to the struggle of the Reformation—feelings of antipathy for Rome—were already fermenting in men's minds. The Pope of the time, Alexander VI., had brought the scandals and the tyranny of the Papal throne to a climax. In 1496 fresh edicts had been issued forbidding, under penalty of excommunication, the printing of any book without the sanction of the Bishop of the diocese. The history of the Reformation shows how widely these laws were evaded, and that of German art still more how openly they were defied. While the Church of Rome in Italy was surrounding itself with the richest forms of Italian art, the homely woodcuts and engravings of Germany were circulating protests against its abuses and exposures of its errors among the great body of the people whom no books reached. To them these forms of art were strictly "Libri idiotarum." Conspicuous among those thus openly sold, was a small engraving under the signature of W, and bearing the inscription "Roma caput mundi;" now a very rare print. In the centre stands a female monster with an ass's head and a tail, one leg terminating in a goat's hoof, the other in a vulture's claw; the left hand outstretched; the other a cat's or a tiger's paw. The Tiber and the Castle of St. Angelo complete the scene. The print went by the name of the "Pabstesel" or Pope's ass. This appeared in Nüremberg in 1496. The young Albert Dürer began to work at his Apocalypse in 1494; and we may safely believe with something of the same aim, for his figure of the woman seated on the beast is stated to be the first known study by his hand for any work. The Apocalypse was no new subject in Christian art. As the mysterious triumph of moral right and of the heavenly powers over the evil of this world, it had always offered consolation to the oppressed, and at that period of Papal corruption in Germany no more popular theme for the artist's pencil could be chosen. Our master had evidently pondered over the subjects during his four years' absence, and seen much to sharpen their moral. The question has been mooted, whether he was the cutter as well as the designer of these blocks. There can, however, be no doubt that whether he cut them or not, he knew exactly the powers and limits of the art. Thus only could he have created that revolution in it which his woodcuts inaugurated. Before his time a block-book was a thing of coarse outlines, rudely coloured by hand, and only carried far enough to be so filled up. Dürer's Apocalypse needed no colouring, and did not admit of it. It conveyed in itself a sense of colour and effect, far more picturesque than any gaudy illumination could give. His lines never hesitate as to what they mean, and any true eye and practised hand could follow them; and he thus educated the workmen fitted to do the work justice. This series was a new revelation to the artist world both in style and power. It was entitled to the same epithet "la maniera moderna," which was applied to Leonardo da Vinci's "Last Supper," all but contemporary with it. Nor was the precision of hand more novel than the command over the forms of men, animals, and things. The forms were far from beautiful, nor as yet correct, but they were set in motion as never before by a German engraver. We have only to turn to the Four Riders in the Apocalypse, to see a rush of impetuous movement as admirable to this day as it was remarkable then. The nature of the subjects, where symbols in description become realities in representation, is the last a modern artist would choose, and as such it remains the only defect in this marvellous series.

It is evident that the general practice of the goldsmith's art exercised a strong influence on all early German schools. The vessels employed in the sacrifice of the Mass, and the gold and silver heirlooms in old burgher families, had raised up a race of workers in metals in whom hand and eye were trained to utmost decision and accuracy. The transfer of these qualities to wood, copper, or panel, had its advantages—for these are qualities common to all forms of art—but no less its penalties; for they carried also with them the hardness and angularity of the goldsmith's hand into forms for which they were unfitted. No drapery in any known stuff—unless in cartridge paper—could take the rigid folds and breaks in which German Madonnas and saints are enveloped. Even the technical methods of the metal carver cling to the school. The drilled points and holes by which he measures his depths, and round which he models his forms, are recognisable in what is professionally called "the snapt drapery," or "the drapery with eyes," common to early German art. From these mannerisms Albert Dürer is far from being free—though it is curious to compare the drapery which he copies from common forms of dress, with that in which he follows prescribed ideas; at the same time no artist that ever lived applied to higher uses those qualities which his early goldsmith training had given him: we cannot study a work by him without perceiving parts which show their evident translation from metallic forms by the facility with which they would translate back again.

In the years from 1496 to 1504 were doubtless executed many of his single woodcuts representing mythological subjects. It was a period of classic pedantry in Germany, in imitation of the classic revival in Italy. Schools for poets, so-called, conducted by men who Latinised their names, were accordingly founded in various towns for the instruction of young men, who, as Ranke says, lived chiefly on alms and had no books. Such a one arose in Nüremberg, under the auspices of Conrad Celtes, who there published his "Quatuor Libri Amorum," in 1502, in the illustrations of which Albert Dürer took part.[*] The reader interested in tracing some of the occult meanings in this literature, will find ample speculation upon them in Herr Thausing's work. It would be absurd, however, to think that the artists of the day, whether German or Italian, went deep into these studies. A very little Latin, as with Raphael, sufficed to interpret a classic subject, and though Dürer is said to have read his Vitruvius, yet it is doubtful whether he or the Venetians were so far versed in classic lore as to know the difference between a centaur and a satyr.

Albert Dürer's drawings on wood had, as we have said, created a revolution in the art. Considered merely in the light of fineness of execution, they have been equalled and are equalled at the present day. Some may even aver that woodcutting now achieves triumphs which he dreamt not of, being in some instances scarcely distinguishable from line engraving. But this is rather a tribute to the master than the reverse. He never sought to make one art look like another—he never imitated on wood the effect of copper or steel. But when he exchanged the pencil for the graving tool, he at once attained an excellence which equally surpasses all that has followed as all that preceded it. With his first productions in this line, Albert Durer took his place as the greatest engraver the world has known. His Adam and Eve, and his St. Hubert (sometimes called St. Eustace), with horses, dogs, and stag, are believed to be among the earliest specimens of those prodigies of execution in which he stands alone. The wonder to modern artists is that under such incredibly minute finish—carried out in every part alike—the keeping of the composition should not have been sacrificed. The art of the engraver had not then the aids of a preparatory etching which it now receives. In his plate of Adam and Eve only does he seem to have taken an early proof, and this shows a large portion completely finished, and the rest of the plate bare of all but the tenderest outline. Both these engravings display eye and hand alike marvellous—the one discerning, the other executing, as the French would say, "jusqu'aux yeux des fourmis." Every pebble on the earth, every feather on the parrot, every vein in every leaf is there. This power and habit of minute execution may be claimed exclusively by the Northern Schools. In the frame of the circular mirror in the picture by Van Eyck, No. 186, in the National Gallery, are nine minute medallions in which the magnifying glass will discover nine different pictures of the Passion. Albert Dürer rivalled the great Flemish painter in this respect. In the clasp of the bracelet of a female saint of small scale, he has introduced a Crucifixion with the Virgin and St. John. In most of his portraits also, even when small, we find the bars of the window reflected on the iris, and literally every hair given.

We have had an artist among us gifted with the same strength of sight. The late Daniel Maclise used to say that from one end of Portland-place he could count the wires of a birdcage at the other. The consequence was that this great artist revelled in details which some have thought would have harmonised better with the graver than with the brush. At all events in Albert Dürer's hand this detail never palls. It is always art, not labour. No scratch is without meaning; every stroke is form. It was this that gave him the complete mastery over both extremes. For no one can study his works without perceiving his equal command not only over the boldest possible forms, but over that unerring continuity of line which puts Giotto's supposed O quite out of court. Wherever there is certainty of hand, no matter on what scale, there is freedom. His trees especially are specimens both of his largest and minutest handling: sometimes indicated with a few master strokes, as free as Titian; most often finished with a care which gives the very texture of the bark or wood.

Herr Thausing says truly, "never were the most transparent decision of drawing and the highest finish so united on one and the same plate." As time went on, this transparent decision only inreased. His "Great Fortune" is as ugly a figure as can be well conceived, but her wings, and the straps and buckles hanging from her left hand, have a depth of colour and a silken brilliancy, which mock the simple means with which the effect is produced. These are especially the qualities lavished on his armorial bearings, the most grotesque of his compositions, regarding which one is left in uncertainty whether they are the creations of his own fancy, or the choice emblazonry of Nuremburg "patricians":—a skull, in a shield, transformed into a thing of beauty: a crowing cock as a crest; a boy performing the feat called "making mill sails" in a shield; an old woman riding a man who is on all-fours, as a crest; all these are surrounded by scroll-work, the very *ne plus ultra* of sparkling effect. Few eyes have so evidently loved the light as Albert Dürer's. His engravings are gradations of greater and lesser brilliancy. His very shadows are but close-laid lines with gleams of light bursting between them. Equally grotesque in subject, of kindred beauty of execution, and with a grandeur of wild and fantastic ugliness, is the subject known in various countries—"Lo Stregozzo" of Italy, "Le Carcasse" of France, the "Ware-wolf" of the North. An old hag riding backwards on a he-goat, her hair streaming to the wind, with little urchins playing tricks below; one, bent double, and looking at the spectator between his legs.

To give any enumeration of his 106 engravings would be impossible, but it may be said that the best composition, as such, unites with the highest execution in such plates as the 'St. Jerome' and the 'Erasmus.' Each is seen writing; the saint seated at a desk, in the depth of a large room, with comfortable benches and cushions; the windows of circular Venetian panes, throwing their delicate tracery on the shutter-panels; the rafters of the ceiling of that peculiarly brilliant texture which he gave to all wood. Everything is finished to the utmost; the hour-glass in a kind of tabernacle in the corner, a picture in itself; yet all as harmoniously according, as, in another sense, the lion, ruminating in front, with the pet dog sleeping, curled up, at his side.

The "Erasmus" has the further merit of being a portrait, certainly the finest of all those he engraved from life. He is writing at a table, large parchment folios lying carelessly in front, the quintessence of the picturesque; a jar of flowers before him, with lilies-of-the-valley as distinct as in their identity as the learned theologian himself. This is a late work—1527; "St. Jerome" was executed in 1514. It is impossible to imagine that the hand of man could do more—every quality of art is here, expressed in one only—and it may be added that the hand did no more, for this was his last engraving, and the hand was cold a year after.

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[*] In his woodcut of Philosophy, with the portraits of eminent men, both of classic and Scriptural story, around her, may be found a clue to the curious pictures from the Campana Collection in Paris, known to have been copied by Raphael in his sketch book.

In turning from the execution of the master to his forms, we turn to a feature which, with his perfect accuracy of eye and hand, can only be accounted for in two ways. Either there was a strange deficiency of beauty in the human beings around him, or a strange deficiency of taste in himself. For Albert Dürer was often exquisite in his rendering of animals—witness his dogs—and always in that of things; he was homely, grotesque, and exaggerated in that of his fellow-creatures. The question must be left open, for even the total ignorance of the canons of the antique will not account for his favourite type of physiognomy. The highest aim in most forms of art is female beauty; and among the old masters it was the beauty of One who was highest among women. It cannot be doubted that Albert Dürer did his best in the conception of the Madonna, nevertheless, she is always a big-headed, double-chinned, most clumsy woman, with no pretensions to the tender youth and grace assigned by feeling and art to the Virgin Mother of the Divine Babe. It is surmised that he did not heartily join in her worship, and at all events he frequently represented her without the nimbus. Even in his finest pictures, such as the Italian Trinity at Vienna, a certain caricature of feature and pose of the head intrudes. This is the more apparent where he attempts a classic figure. In his group of Apollo and Diana there never was such an ill-favoured immortal seen as the goddess! Yet this incapacity for beauty of form did not extend to that portion of the human figure which comes next to the head in difficulty; his hands, namely, are generally exquisite in drawing and expression.

Still we should be very unworthy critics of this great man, did we not admit the grandeur he occasionally imparts to a physiognomy. In that of our Lord he has bequeathed us the two extremes. In some of the scenes of the Passion his conception is most ignoble; treated as a single head, or as seen on the Sudarium upheld by angels, the expression is almost terrible in its superhuman grandeur.* Albert Durer was both realist and idealist, and never were the two characters more widely apart in the same man. In the first he only gives what he sees, however low and grotesque his model. In the second he revels in the mysterious depths of his imagination, as in two instances we shall mention presently.

Perhaps there is no higher tribute to our master then a comparison between his woodcuts and Marc Antonio's copies of them. The slight admixture of Italian feeling given to the homely German forms sits ill upon them. In diminishing the grotesque expression of some heads, the Italian engraver has lost all their character. In most copies something of vitality must be sacrificed, but in these the sacrifice is that of life itself, for Albert Dürer's plates are alive, Mark Antonio's dead. Especially do we see this in the beautiful composition of SS. Anna and Joachim embracing at the gate of Jerusalem, which is one of the finest in the series of the Madonna's life.

We now come to a third quality of art—that of thought—in which he may be said to be no less extraordinary than in that of execution. In the regular cycle of oft-repeated religious subjects, however distinct he may be in telling the tale, he gives but few original conceptions. These are, however, of the highest order. In no subject of Christian art has the real meaning been so buried beneath strange misapprehensions as in that of the Agony in the Garden. Our Lord is but a tame accessory in a composition where three huge sleeping figures and a theatrical angel engross the space and attention. Albert Dürer in two versions of the subject has given *the Agony* itself. In the one Christ is prostrate on the ground; in the other the arms are flung aloft as in the antique gesture of despair. Both Bartsch and Herr Thausing strangely misinterpret this action as a protest against the Cross the angel is holding before him. But his finest expression of spiritual and dramatic power appears in that mysterious subject called "The Man of Sorrows," heading his Little Passion, which in the soulless routine of religious art has been more repeated, and degraded than any other. Our Lord, almost nude, as from the Cross, is seated on a stone, bowed down with grief, his elbow on his knee, his hand half covering the face, the crown of thorns on his brow. In this embodiment of the crucified yet living Saviour, Albert Dürer stands unrivalled. No other artist has so solved that paradox peculiar to the Christian faith—the Man of Sorrows, yet the Lord of all. No one has made the sorrow and shame so touching, yet the Deity so triumphant. Had the master left nothing else, this would have sufficed to characterise him as an artist of the intensest devotional feeling.

Again, when he takes a subject which lies outside the repertory of Church art, such as the Prodigal Son—of which he has left both drawing and engraving—we see his power over those deeper touches of nature which redeem the lowest accessories. The scene is a homely farmyard; the Prodigal, supposed to be his own portrait, kneels in devoutest penitence beside a trough in which huge pigs are contending for their food, one of them with a peculiar expression of his wicked little eye levelled at his improvident human companion.

But it is in a form of mysterious conception too definite for the sublime, but peculiar provocative to imagination and curiosity, that the special character of Albert Dürer's art is found. There never was a subject so distinctly given and yet so unintelligible as that of the "Melancolia." Herr Thausing's solution of the "Four Temperaments," of which this is one, gives a title, but nothing more. There are plenty of instances where a forgotten tale or passage in history has been the origin of a surviving picture. "The Calumny of Apelles," so favourite a subject with the mediæval painters, including Albert Dürer, might have furnished cause for speculation had Lucian's description not survived. Still, the scene gives an intelligible incident. We see a judge enthroned, a suppliant, accusers, &c.: we feel that it is a translation from one language into another, and we translate it back again. But in the "Melancholy" we gain no clue. A magnificent female figure is sitting in an attitude of deepest meditation; but why she should be winged, why the cherub at her side should be seated on a millstone, why a starved wolf-hound should be at her feet, why the globe, the polygon, the plane, the saw, the hammer, &c., should lie around her, and the meteor and the bat appear in the background, all this has been hitherto asked in vain. Mr. Stopford Brooke, in two fine sermons, has gone far in moral and spiritual interpretation. It is the Book of Ecclesiastes, "In much wisdom is much grief." We can endorse this solution as far as it goes. But this idea is general and vague, the picture itself is definite and particular. That it should be so, and yet so unreadable—so unreadable and yet so interesting—is the real point in question.

The other plate, called "The Knight, Death, and the Demon," is also declared to be another of the "Four Temperaments," for which again we are not the wiser. It is the figure of a stern man in armour, riding immovably on, with two frightful apparitions beside and behind him. Still it is not difficult to believe that the lonely and rocky defile typifies the passage of this life, the monsters the temptations that beset it, and the horseman the Christian soldier. Indeed the plate, in the master's time, was called "The Reformation's Knight," a name in keeping with the feelings of the time. The monster with the hour-glass is evidently a "Memento mori"—the other an image of fleshly temptation, for it is the same that appears to the sleeper in "The Dream." But to our view the knight does not see his ghastly attendants, but is pursuing his way straight on, firm in faith, and in the sense of the Divine protection. Herr Thausing's idea, that his "laughing muscles" are strongly agitated as he derides the wiles of the enemy, is singularly far-fetched. The original engraving represents a hard-set face, with no expression but that of an iron determination.

The new building of the British Horological Institute, in Northampton-square, Clerkenwell, was opened on Thursday in last week by Sir Edmund Beckett.

BOOKS RECEIVED.

Practical Lessons on Painting on China, &c., by the Baroness Delamardelle and M. F. Goupil (London: Lechertier, Barbe, and Co.), seems really what the title indicates, in spite of the introduction, which is after the manner of Victor Hugo, without the genius which excuses that distinguished poet's contempt for the conventionalities of composition.——*The Model Locomotive Engineer, Fireman, and Engine Boy*, by Michael Reynolds (London: Crosby Lockwood and Co.), is the work of one who has devoted time and productive labour to the improvement and education of locomotive engineers, and the book before us is by no means his worst contribution to his task. Apart from its interest to workmen, it will be eagerly read by all boys of a mechanical turn of mind.——*Jordan's Tabulated Weights of Iron and Steel* (London: E. and F. N. Spon) has reached a third edition, and deservedly. It is as handy and accurate a pocket compendium as any we know of, and it gives a good deal of information for the use of naval architects and shipbuilders not to be met with elsewhere.——*Practical Treatise on Wheels, Worms, Screws, &c.*, by Elliott Holden, Swindon (published by the author), is a reprint with additions of a capital series of letters which appeared in the *English Mechanic*.——*Letter Painting made Easy*, by J. G. Badenoch (London: Crosby Lockwood and Co.), which forms No. 205 of Weale's "Elementary Series," is a system of rules for the use of letter painters, meant to supersede the "rule of thumb," which is at present the only guide. The system is a simple one, but quite original and well worth the careful attention of letter painters. It can be easily mastered and remembered, and even if not always adhered to will benefit the workman.

CHIPS.

The new waterworks for the supply of Bridgwater are expected to be completed, so as to supply the town, within a fortnight's time. On Monday the Mayor officially turned on the water from the impounding reservoir into the first filtering bed.

A new Wesleyan chapel was opened at Kingsteignton on Monday week. It is Gothic in style, and built of limestone, with Portland cement dressings; it measures 40ft. by 50ft., and is 20ft. in height. Low-backed deal seats accommodate 180 persons. On the sides of the rostrum are panels filled with red velvet. The cost of erection has been £500. Messrs. J. W. Rowell and Son, of Newton Abbott and Torquay, were the architects; and Mr. Gribble, of Newton Abbott, was the contractor.

At the Michaelmas Quarter Sessions for Glamorganshire, held on Monday, it was decided to expend £6,000 in enlarging the county pauper lunatic-asylum at Bridgend. It appeared from an analysis that the water supply of the asylum was bad, and it was decided to have filtered water from the river Ogmore at present, the county surveyor being instructed in the mean time to ascertain if a better quality of water could not be obtained, and report at the next quarter sessions.

A well that was in course of construction by the Diamond Rock Boring Company's process at Brockwood Asylum, Surrey, has had to be abandoned in consequence of unexpected difficulties encountered in the stratification, and a new site has been selected 300 yards from the old one, and in it a small preliminary boring is being made.

The question of the purchase, by the Hastings Town Council of the Subscription Gardens at St. Leonards for public recreative purposes, over the advisability of which the town has been divided for some time past, has finally been settled by the receipt from the Local Government Board of a communication intimating their willingness to sanction the acquisition of the land at the proposed cost of £70,000.

Two painted glass windows have just been placed in South Reston parish church, Lincolnshire. That at the east end of chancel is occupied by the Ascension. The subjects of the north-east window are Christ arrayed in the purple robe and crown of thorns, and St. Mary Magdalene clasping the cross. The work has been executed by Messrs. Gibb, of Bloomsbury.

Biddulph Moor Church, Congleton, has undergone a thorough cleaning and painting. The chancel ceiling is in white with gold stars, and the upper part of the walls the same colour as the nave. The dado is of a deep red, with a 6in. band between, and with a chain of Maltese crosses in gold. The floors have been laid with Minton, Hollins, and Co.'s tiles. The decorators were Messrs. Gee and Pemberton, of Stoke-upon-Trent.

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* Albert Dürer created a new type of Christ—partly taken from his own head. His words were "Every mother admires her own child, and accordingly many painters render what is like themselves."

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Indian Graves in America.—An extensive burial-ground of the Lenni Lenape or Delaware Indians has recently been examined by one of the scientific societies of Pennsylvania. The cemetery was located on the north bank of the historical Brandywine Creek, on a prominence overlooking the valley. About twenty graves were opened with the following results:—The skeletons were stretched at full length with the heads towards the east. The depth of the graves was about 3ft. Associated with the bodies were quantities of Venetian beads, of various sizes, shapes, and colours, and a number of objects of Indian workmanship such as arrow-heads and bead ornaments of stone. In two of the graves were found several antique clay pipes of considerable interest, with the initials "R. T." stamped in the bowls. In the beginning and middle of the 17th century pipes were made by various makers in the vicinity of Bath, England. Among these was one Richard Tyler, and the initials "R. T.," in all probability, were impressed at his manufactory. An approximate date can, therefore, be assigned to these objects with some degree of certainty. The earlier British pipes, sometimes called elfin or fairy pipes, and by some antiquaries attributed to the Romans, made, however, in the reign of Queen Elizabeth, frequently possessed the initials of the makers' names on the bases of the flat spurs which characterised them. These were gradually superseded by pipes with elongated bowls, in which the spurs or heels were pointed or entirely absent. The more recent English pipes, of the last century or thereabouts, had the names of their makers stamped on the stems. The examples referred to are of the elongated pattern, minus the heel, with the initials stamped in the bowls. The stems have been broken off about 6in. from the bowls, having been originally longer. They were taken to America by the early settlers and traded to the Indians. These graves, while only perhaps a century or so in age, are particularly valuable to the student of American ethnology as producing skeletons of the tribe inhabiting the valley of the Delaware River at the time of the settlement of the States. Such remains have been exceedingly rare in Pennsylvania, and no graves have as yet been opened which did not produce objects of European introduction. At an early day the society will push their researches further, when other interesting facts will undoubtedly be brought to light.

SCHOOLS OF ART.

Birkenhead.—The annual distribution of prizes in connection with the Birkenhead School of Art took place on Thursday week. Mr. John Bentley, head master, read his report, from which it appeared that the numbers attending the various classes had been affected by the prevailing depression in trade more than in any previous year. The total number of students attending all classes showed a decrease of 45 from last year. The evening classes had been attended by 156, and the morning classes by 64 students; total, 220; showing a decrease of 31 in the night classes, and 14 in the day classes. The annual Government examinations, conducted by means of papers, were held on the 1st and 2nd of May, when 129 candidates were examined in one or more of the four subjects comprised in the second grade—namely, freehand drawing, model drawing, practical geometry, and linear perspective. 217 papers were worked, of which 80 only were successfully passed by 56 candidates. Of these 24 received the mark "excellent," and were awarded Government prizes; and 32 the mark "good," obtaining certificates of proficiency. It was a fact worthy of record that again a lady student passed the whole of the four subjects at the same examination, and so obtained a prize of the third or highest grade. The number of full certificates gained this year—that is, students who have passed the four subjects in one or more years—was 13. In the advanced local art examinations, for which students of the school alone were eligible, nine were examined, and five were successful, viz., one in architecture, two in perspective—one obtaining a Queen's prize,—and two in modelling in clay from the living model. One lady student submitted the works (ten in number) for permission to be examined for the first, third, or highest grade certificate (art teachers'), and these being accepted, the candidate presented herself in London for examination, and being successful in passing all the subjects, a certificate was granted and her expenses paid. On the 8th of April 229 students submitted 1,689 models, paintings, and drawings, for inspection in London. Of these, 161 were in the advanced section of study, and comprised 141 drawings, 17 oil paintings, and 3 casts, being the productions of 32 students. 1,528 were in the elementary section of study, and were produced by 197 students. In the advanced section ten prizes were awarded, and ten works were selected by the examiners and retained for national competition, five of which were rewarded, obtaining two bronze medals and three Queen's prizes. In the elementary section five prizes were awarded, making a total award of 17 third-grade prizes for the year, as against twelve in 1878 and nine in 1877.

Hastings.—The prizes gained by the members of the Hastings and St. Leonard School of Art and Science at the May examinations were distributed at the Claremont building, by Mr. T. Brassey, M.P., on Monday evening. The fourth annual report of the committee spoke in congratulatory terms of the progress of the school, both in number of students and in the excellence of work done. During the year Mr. Sullivan had carried on the Art class, and had also established classes in Building Construction and Practical Geometry. Mr. Brassey, in his address, attributed the success of England at the Paris Exhibition largely to the schools established in connection with the South Kensington Museum, and expressed a hope that the Hastings school would become a place for the development of decorative art. The prize distribution was also availed of as an opening night for Mr. Brassey's loan collection of pictures, which will form an autumn exhibition. These are chiefly modern works, by English painters.

CHIPS.

A new Baptist Church at Bowdon was opened on Tuesday. The building, which is in the Italian style, will seat 500 people, and has cost about £2,500. The architect is Mr. W. Owen, of Deansgate, Manchester.

The *West Briton* states that the demolition of St. Mary's Church, Truro, to clear the space for Mr J. L. Pearson's new cathedral, will be commenced soon after Christmas, and that the whole of the pile of buildings from the Bear Inn to Miss Blee's house in the High Cross, and including the whole of Mill-lane, will soon follow, so as to lay the whole site open.

New Board schools have just been completed at Teignmouth, and are to be opened on Monday next. The buildings accommodate 128 boys, 128 girls, and 184 infants. The boys' and girls' rooms are each 50ft. by 20ft., with class-room to each 20ft. by 14ft., and the infants' room is 56ft. by 23ft. The space beneath the floor level is utilised as covered play-sheds. The walls of the basement are built of grey limestone, and the superstructure of red brickwork, while the dressings, bell-turret, and chimney cap are of Beer freestone. The roofs are covered with grey slates, and internally are ceiled at the back of principals and collar-ties. The style is Early English. Messrs. Rowell and Son, of Newton Abbott and Torquay, were the architects; the contract was taken by the late Mr. J. Jackman, of Teignmouth, and has been completed by his widow, Mr. Pullen, of Exeter, acting as foreman. The cost of erection has been £5,300, and of site £3,000.

Rastrick Church, near Halifax, is at present undergoing restoration under the supervision of Mr. W. S. Barber, architect, of the latter town, and will be reopened on Nov. 29th. A new organ chamber and rector's vestry are being erected at the east end of the church, and the organ is being enlarged by Messrs. Conacher, of Huddersfield. The west portion of the edifice, where the organ formerly stood, is being seated. Choir stalls will be placed in front of the organ, and the chancel will be decorated with texts and figures. Amongst the additions to the church may be noted a stained glass window illustrating The Transfiguration of Christ, new altar, pulpit, and lectern. The contract for masonry has been taken by Mr. Bottomley, of Brighouse, and that for joinery by Mr. Bottomley, of Rastrick.

A school, accommodating at present 200 boys, is being erected for the directors of the Plymouth High School for Boys, at Ford-park. The building is plain and substantial, and Tudor in style. The contractors are Messrs. Blatchford and Son, of Tavistock.

Building Intelligence.

Albrighton.—The parish church of Albrighton, near Shrewsbury, erected about fifty years ago on the site of an old one, was reopened on the 12th inst., after enlargement and alteration. The improvements comprise the rearrangement of the nave and substitution of oak open seats for high pews, and the building of a chancel with apsidal termination; also an organ-chamber and vestry on the north side. The chancel is furnished with oak stalls, and the wood floors of the nave are renewed. The lectern and altar rail are of oak. The nave roof has been improved internally. The old Norman font is preserved, and the Jacobean pulpit and canopy are fixed at the south east angle of the nave; the Ireland slab or ledger (date 1712) is also preserved. The chancel and sanctuary floors are paved with Maw's encaustic tiles. The material used for the new work is Harmer Hill stone, and the chancel walls are pointed internally—not plastered. Mr. Done executed the glazing, painting, &c. The contractor was Mr. W. Bowdler, of Shrewsbury, and the architect Mr. Haycock.

Blantyre.—The opening of the new building intended primarily for the accommodation of the Masonic brethren of Lodge "Livingstone," Blantyre, took place on Thursday week. The new building, the architect of which is Mr. John B. Wilson, West George-street, Glasgow, is situated at the corner of Forrest-street and Hamilton-road, having a frontage to the latter of 36ft., and in Forrest-street of 70ft. The hall or lodge-room is spacious and well-proportioned, being 55ft. long by 32ft. wide, with a ceiling height of 20ft. Beneath the main cornice is a deep frieze, which it is proposed to fill with a fresco, illustrating the various industries of the district. The upper lights of all the windows are glazed with tinted antique glass-work, the twelve lights of those in front containing the Masonic and Free Gardeners' emblems. In connection with the hall are provided a suite of ladies', committee, preparation, and refreshment rooms; while a "lift" from the kitchen of the restaraunt beneath is conveniently placed. Externally the style of architecture adopted is French Classic. The hall entrance is marked by rusticated pilasters, springing from the capitals of which are carved trusses supporting the cornice. The contractors for the work were—R. Davidson, Blantyre, wright; Craig and Finlay, Hamilton, plasterers; R. Morton, Uddingston, slater; A. Cameron, Uddingston, plumber; D. Gordon, Glasgow, glass work; and Kean and Wardrop, Glasgow, tiles. The total cost will be slightly over £3,000.

Bradford.—The Gas Supply Committee of the Bradford Corporation are engaged in the erection of new works of an extensive character. The works are being erected partly by the Corporation and by Messrs. Birkby, of Wyke, who have the contract for the masonry. The first of the retort houses, a large, massive building, stone on the outside and lined with brick, has been reared, and the iron roof has been placed in position. There will be two chimneys, built of white fire-clay bricks. Two large tanks for the gasholders, one 150ft. and the other 180ft. diameter, are in a forward state. The walls of the latter have risen to the ground level, and the other is well advanced. Messrs. Birkby have had the excavation of these tanks, which are 33ft. deep. The walls of the tanks are built of brick, with ashlar stone binders, and they are strong and massive. The walls are being coated with cement. The Corporation are making their own bricks, of which they will require an immense quantity. They have a machine, driven by steam power, which can turn out about 10,000 bricks a day. The works are being executed from the designs of Mr. Swallow, the gas engineer, and are superintended by his nephew, Mr. Whitehead.

Dublin.—The parochial (R. C.) church of St. Nicholas, in Francis-street, was reopened on Sunday, after re-decoration and improvement. The church was embellished thirty years since, from the designs of Mr. Frederick Barff (now Professor Barff, of London University, and the Catholic College, Kensington), but the wear and tear of years had caused great deterioration in the effect. The present work has been carried out by Messrs. Dockrell, Sons, Martin, and Co., of Dublin. The entire church has been repaired and redecorated; the elaborate ceiling has been freshened, and those portions over the chancel and transepts have been regilt. The reredoses of each of the side altars have been gilded and bronzed, the Stations of the Cross regilt and painted, and the pilasters throughout the church are coloured in imitation of rare marbles. The splays of the windows have been decorated with colour, and monograms placed in each. The organ, which was built in 1841, has been repaired and improved by its constructors, Messrs. Telford and Telford, of St. Stephen's-green, and the case has been decorated by Messrs. Dockrell.

Edinburgh. — On Saturday afternoon the foundation-stone of a new U.P. church at Rosehall, Edinburgh, was laid. The church, the walls of which have already reached a considerable height above ground, is in the Early Italian style of architecture, though the French Romanesque predominates to some extent in the details of the work. The plan is cruciform. At each side of the front facing Dalkeith-road there is an entrance porch, from which stairs to the galleries are carried up inside two flanking towers placed at the junction of nave and transepts. The height of these towers will be about 70ft., and they, as well as the whole of the Dalkeith-road and Marchhall-road frontages, are being built of polished ashlar. The estimated cost of the building, which is being erected from plans by Messrs. Sutherland and J. Russell Walker, architects, Edinburgh, is £6,000.

Glasgow.—The Christian Institute, Glasgow, was opened last week. Situate in Bothwell-street, the building, which is in the Gothic style, is ornamented in the front with figures of Knox and Tyndal over the doorway, and sculptured heads of Wycliffe, Luther, Zwingle, Melancthon, Calvin, Wishart, and Cranmer over the windows of the first floor. The large hall is 85ft. long by 43ft. wide, and the accommodation, including the platform and gallery, is calculated at close on 1,000. The whole of the windows in the north of the hall are filled with stained glass. In addition to this large hall, there are class-rooms, library, and reading-rooms, while in the sunk flat is a gymnasium, kitchen, &c. There is a tower over the Bothwell-street front rising to the height of 126ft. The building was designed by Mr. John Macleod, I.A.

Ipswich.—At a meeting of the Ipswich Town Council, held on Thursday in last week, a report was received from the Post-office Committee stating that they had advertised for tenders for the erection on the site of the existing Corn Exchange of a new post-office and municipal offices, from the plans of Mr. John Johnson (whose design we illustrated on Sept. 12th last). Ten tenders were received, the lowest being that of Messrs. D. C. Jones and Co., of Gloucester, £10,370, if Portland stone were substituted for Ancaster stone, or £9,736 if erected according to specifications. Certain reductions had been made in the design, and the committee recommended the acceptance of Messrs. Jones's amended tender for £9,236. Portland stone would be used throughout, but the emblematical figures on the projecting portico, and some of the external carvings would be omitted; stone would be substituted for tiles in the interior, and the clock, shown on the front of the building, would be replaced by the Royal arms. The reduced plans were, after discussion, adopted, and Messrs. Jones's tender accepted at £9,236.

Loughborough. — The Loughborough Endowed Girls' School was opened on Friday week. The building cannot be assigned to any particular style, as it is made up of a variety, Elizabethan being particularly noticeable. The school is built of red bricks pointed with black mortar, and relieved with white stone dressings. The roof is high, and covered with small Broseley tiles. The plans for the building were prepared by Messrs. Gilbert and Stevenson, architects, of Nottingham, and the schools erected at a cost of £4,300 by Mr. Clipsham, builder, of Norwell. The clerk of the works was Mr. E. Bunting.

Luton.—The committee and trustee of the free library and museum have just adopted plans prepared by Messrs. J. R. Brown and Humphreys, of Luton, for the required buildings, which will be erected on a site at the corner of George-street and Williamson-street. The designs show a building in the Italian style, freely treated, with circular-headed windows. The street fronts will be executed in Luton grey brick with freestone dressings. In the basement will be a room 58ft. by 30ft., and 8ft. high; it will have a cement floor and fireproof ceiling, and is intended to be let as a store. On the ground-floor will be the free library, 41ft. by 30ft.; it will be lighted from above and from one side, and floored with solid wood blocks. Near it will be librarian's room, 12ft. square, lavatories, &c.; and on opposite side of entrance a committee-room, 16½ft. by 11½ft. A stone staircase will lead to the first floor, on which are arranged the museum, reference-library, and ladies' room. The heating is proposed to be by open fireplaces. The estimated cost is £1,500.

Metropolitan Board of Works.— At this board on Friday, the tender of Messrs. Kellett and Bentley, amounting to £3,079 11s. was accepted for the extension of Wood-lane sewer along the east side of Wormwood Scrubbs. The resignation of Mr. T. Gibson, assistant clerk in the engineer's department, who has been thirty-five years in the service of the board, and their predecessors the Commissioners, and now retires from ill-health, was accepted, and a retiring allowance of £186 13s. 4d. per annum granted him. The works committee presented a report on the Artisans' and Labourers' Dwellings Improvement Act Amendment Act, 1879, in which they stated that it will probably diminish the expense of carrying the provisions of the original Act into operation. The following loans to Metropolitan Local Authorities were granted:—Paddington vestry, £3,200 for purchasing freehold land at Alperton for a dust depot; St. Giles and St. George's Guardians, £20,000 towards rebuilding the workhouse; Guardians of St. George's in the East, £700 for completing workhouse infirmary; Lambeth Guardians, £10,000 for erecting infirmary and probationary wards at the industrial schools, Lower Norwood; Central London School District Board, £15,500 for carrying out alterations and additions at the school in Hanwell; and Limehouse Overseers, £1,300 for completing Town-hall. The Vestry of Kensington was granted permission to borrow £2,800 for the erection of stabling and other premises in Warwick-road, and the Fulham District Board was granted a like permission as to £8,820 for wood-paving works. A memorial from the last-named board asking for the embankment of the Thames at Hammersmith, was referred to the works committee. Several members complained of the cost of supervision of contracts executed in the engineer's department, and the whole subject was referred to the works committee for consideration. In answer to complaints as to the great expense devolving on the board in making up the bridges acquired under the Act for freeing them from toll; the engineer showed that the condition of the roadways, as well as of the structures was brought under the notice of the arbitrators, and was taken into account in the amount of compensation awarded to the late owners.

Monkton, Devon.—The village church of Monkton, situated about two miles east of Honiton, has, during the last few years, undergone a complete restoration, and the finishing touches now put on it make it one of the prettiest and most unique of country churches. New windows of stained glass have been placed in the chancel and nave. The east window is a memorial to the late Richard Sommers Gard, Esq., formerly M.P. for the City of Exeter, and Lord of the Manor of Monkton. It contains simply the figures of Our Saviour, St. John, and the Virgin Mary. In the windows of the nave are the figures of the Patriarchs, Adam, Moses, Elijah, Abraham, David, and Solomon; and on the south side, St. James, St. Paul, St. Peter, and St. John the Baptist, all executed in a masterly manner by Morris and Co., of London. There is also a pretty little window on the south side of the chancel, by Wailles, representing Mary Magdalene (to whom the church is dedicated) kneeling at our Lord's feet, near the door of the sepulchre. The decorations are from the designs of Mr. Hicks, of Newcastle. The upper part of the walls is painted in a light warm tint, the lower part, to the height of 9ft., is painted to form a dado, filling and frieze; the dado is of a plain sage green, the filling in the chancel consists of a diaper composed of a geometrical arrangement of oak-leaves and acorns on a duck's-egg green ground, filled in between with a graceful flowing pattern of the willow-leaf. The design of the frieze is a conventional treatment of the rose and lily, in the form of a scroll on a cream-colour ground; this is surmounted with a capping of an indented moulding of oak. The walls of the nave are decorated in a similar manner, except that the sacred monogram and crown take the place of the oak leaves, and the Beatitudes are written on the portion forming the frieze. The Creed, Lord's Prayer, and the Ten Commandments are painted in church-text on the east walls of the chancel and nave. At the west end of the church is a neatly-carved open screen, dividing the nave from the belfry; and in the tower are six sweetly-toned bells. The decorations have been carried out by Mr. John Algar, of Gandy-street, Exeter.

New Sadler's Wells Theatre.—In designing this theatre, which is practically a new theatre, Mr. C. J. Phipps, the architect, has not been unmindful of the responsibility which rests upon the constructors of places of amusement to provide ample means of escape in case of fire. From every part of the house the visitor may be assured of finding an easy way of reaching the street in case a panic from any cause should render it necessary to open the additional doors and staircases. With the experience gained in the building of no fewer than 23 theatres, Mr. Phipps has made the most of the peculiarly advantageous situation of Sadler's Wells, for the theatre, it should be noted, has three sides giving access to the street. The staircases are all wide, constructed of stone, with brick walls on both sides, and with only flights between the landings. The doors are all double and open outward, and in the case of the additional exits from the several parts of the house there are no locks, the doors being held only by bolts on the inside, which can be drawn by anyone. The traditional tank on the roof is dispensed with as useless, but instead a hydrant is fixed in the wall of the family circle, and long pieces of hose which may be attached to this would enable the firemen to play upon any part of the interior, as the hydrant is connected with high pressure mains fed from reservoirs at Highgate. Against fire from the part of the house most in danger special precautions have been taken. The stage is a very spacious one. The width, including the scene docks, is more than 100ft., the depth 50ft., and from the stage level to the "gridiron floor" above, the height is over 50ft. This great height of roof is desirable, inasmuch as it enables the scene-shifter to draw up his scenes without rolling them, but it renders necessary additional precautions against fire, and there are, accordingly, two hydrants provided—one one the stage level, and another on the level of the "flies." There are also ways of exit from the stage—one opening on either side directly into the street, and one into the vestibule leading from the orchestra stalls.

Petrockstowe.—The ancient parish church of Petrockstowe, a village nine miles from Torrington, and fourteen from Okehampton, having fallen into complete dilapidation, has been rebuilt from the foundations with the exception of the fine old tower. The building was reconsecrated on Monday. It consists of nave and chancel (the latter extended eastwards to give better choir accommodation), north and south aisles, and porch and tower. A noticeable feature of the rebuilding is that the interesting Early English arcade, which belonged to an earlier church than the Perpendicular one which has been restored, has been retained, although the other does not correspond with it, being in a totally different stone, as well as in another style. The roofs follow the old barrel-shape, and the corbels have been carved by Mr. Harry Hems, of Exeter. Mr. J. F. Gould was the architect, and the contractors were: Messrs. Grant, carpenter; Medland, mason; and Eastman, plumber; all of Great Torrington. The total cost was about £2,000.

St. Sepulchre's, Holborn.—The extensive restorations which have for some time been in progress at this old edifice are fast advancing towards completion. Within the last day or two that portion of the work connected with the windows has been finished. The mullions and tracery work of the windows have been renewed, and are now all filled in with cathedral glass in pale green and blue. An interesting discovery was made in taking down the gallery at the west end of the church. This gallery and the organ entirely obscured from view a lofty Gothic central arch, manifestly erected when the church was built. By the removal of the gallery and the organ this arch is now fully opened to view. Two other deeply-recessed Gothic arches on the north and south sides of the western entrance have likewise been opened out and restored. It was found that these arches had for years been hidden by having been filled in with rubble and built over. The piers and arches of the nave arcade, as well as the walls, have all been refaced, while the ceilings of the nave and aisles have been decorated in delicate tints, and sunlights erected along the ceiling of the nave. The organ chamber will be in a recess about the centre of the north side of the church, in front of which there is an ornamental screen in Caen stone, with columns in Irish green and Devonshire marble. The floor of the church is being laid with diagonal wood pavement. The church is intended to be reopened about Christmas.

Weston-super-Mare. —The foundation and nine memorial stones of the new Weslyan chapel in Church-road, Weston-super-Mare, were laid on Tuesday afternoon. The edifice will be erected from designs prepared by Mr. Allen Lauder, architect, of London and Barnstaple, and the contractors are Messrs. Perry and Harvey, of Weston-super-Mare. The estimated cost of the structure, including purchase of site, is about £2,500. The building will be in the Decorated style, and the plan comprises a nave and two side-aisles, the latter being extended as transepts, and will afford accommodation for 410 persons. It is to be built of local limestone with freestone dressings. The roof of the building will be covered with Welsh slates.

Widnes.—The memorial-stone of the new Church of St. Ambrose, Halton View, near Widnes, was laid last week. The new church is in the Gothic style of architecture. The main body of the external walls will be of selected grey brick, the plinth, sills, jambs, heads, arches, cornices, and pinnacles to be worked in red terra-cotta. The whole of the chancel, which will be of red brick, will be internally faced with red terra-cotta work, with ornamental and moulded bands, and the columns, caps, and bases to the nave arcade in fine bays of red stone, from the Rainhill quarries. The roof of the chancel and nave will be of one height, broken at the junction by a ventilating flèche, which until the tower and spire are built, will also be used as a bell-cote. The church will be divided into a nave, 76ft. long by 27ft. wide; north and south aisles, each 76ft. by 11ft. 3in. wide, with porch entrance. The chancel will be 26ft. 6in. wide, 36ft. long, and 50ft. in height. The tower, 17ft. square and 115ft. high, will be at the north-east junction of the chancel with the nave and north aisle, the base of the tower forming an entrance to the church. A chapel, 18ft. by 16ft, will be built on the south side of the chancel, the vestry to be a separate building, communicated with by a corridor. The clerestory is intended to be an important feature of the structure, which when completed will accommodate nearly 600 worshippers. The architect is Mr. James F. Doyle, of Liverpool; the contractors, are Messrs. Brown and Backhouse, of Liverpool; the contractor for the brickwork being Mr. Isaac Dilworth, of Wavertree.

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CHIPS.

Godalming parish church was reopened yesterday, after restoration.

The new town hall presented to the town of Saffron Walden by Mr. G. S. Gibson, a local banker, was opened a fortnight since. It replaces on the same site the town hall built in 1761, and has been erected from the designs of Mr. Edward Burgess, of Great James-street, Bedford-row. The contractors for the work were Messrs. W. Bell and Sons, of Saffron Walden. Messrs. Haden and Sons, of Trowbridge, have carried out the heating and ventilating arrangements; and Mr. Hodkinson, of Coventry, has supplied the metal fittings throughout. The cost of the town hall has been about £4,000.

A scheme for constructing a light line of railway from the Manchester and Milford system, near Aberystwith, to Aberayon, on the Cardiganshire coast, will probably be carried into effect at once. The plans have been prepared by Mr. A. Szlumper, C.E., who estimates the cost at £30,000, and Mr. David Davies, M.P., one of the fathers of railways in Wales, having offered to find half this sum as capital, the remainder has been raised by shares in the district. Should the line prove commercially successful it will probably be the pioneer of a series of narrow-gauge cheap lines through the mid-Welsh valleys.

More than Fifty Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation render its the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.C.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J, Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line of eight words (the first line counting as two). No advertisement inserted for less than half-a-crown. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

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Cases for binding the half-yearly volumes, 2s. each.

"BUILDING NEWS" DESIGNING CLUB.

J. C. C. (The 6ft. is intended to be the height of the clock case from the floor.)

Received.—E. in square.—G. C. A.

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Correspondence.

IPSWICH CORN EXCHANGE, &c.

To the Editor of the Building News.

Sir,—As the author of design "Exchange," I would beg to be allowed to point out that the estimated rental of £750, alluded to in your notice of my design, would be derivable from the letting of the shops and offices only; it does not represent the annual value of the entire structure; and as this considerable revenue is obtained without sacrificing the Exchange (it seems that this design gives a Corn Exchange of much greater capacity than any of the others submitted, viz., 9,737ft. super.), it would appear that although the cost of the building is estimated somewhat in excess of the majority of the designs, it likewise exceeds them in accommodation, and I venture to submit will favourably compare with the most economical schemes, as the additional money expended would be productive of remunerative returns. I would also beg to call your attention to the fact that there was no stipulated cost in the instructions furnished, so that the money proposed to be expended can be shown as laid out to advantage. It is no objection to it that the cost of this scheme is somewhat in excess of some others, for if a sufficient return can be obtained for the extra money expended, it may yet be the most economical one from a financial point of view; and as a larger Exchange is provided than in any other of the designs submitted, it cannot fail in this respect to meet the public requirements of the town. With regard to the design, it must speak for itself; I will, therefore, offer no remarks on your criticism.

As the competition is still unadjudicated upon, I think it right to reserve my name; that so many have prematurely unveiled I am sorry to see, as in my humble opinion it is a lamentable breach of faith.

Apologising for troubling you at so great a length with my views in this matter,—I am, &c.,

"Exchange" (apparently No. 1).

SHEFFIELD.

Sir,—I am glad to see that in your exhaustive article this week upon the above you draw attention to the very unsatisfactory way our parish church restoration is being carried out. That architects who have but little ecclesiastical experience should have so fine a sample of our Yorkshire churches intrusted to them is at best unfortunate; but it must be remembered that Sir Gilbert Scott was nominated a sort of overlooking architect in the affair. His lamented death was not foreseen, and with him as a check things might have gone on smoothly. It is commonly reported in the town that the chancel is to be replastered—a step which, if seriously contemplated, is to be deprecated.

Your remarks upon the Central Schools and Firth College are well-merited. Few buildings probably have ever been erected in England that have cost more money for so poor a return made. There are other things in Sheffield that cry strongly for the light, and another visit by you to our black town will be hailed with pleasure by more than one

Sheffield Blade.

HULL ASYLUM.

Sir,—In your last week's issue there is a letter containing an extract from the *Eastern Morning News*, to the effect that six designs by local architects are reported to have been selected, upon which number the Commissioners in Lunacy are to be asked to adjudicate.

There must be an error in this statement, as there are not six local architects competing.—I am, &c.,

A Hull Architect.

AN ENGINEERING COMPETITION.

Sir,—I do not think we trouble you so often as our brethren to ventilate curious competitions—perhaps we are not so frequently such fools as to engage in competitions without reasonable guarantees for fairness and adequate remuneration. I am of opinion, however, that your readers ought to be made acquainted with a good chance now going of getting their names up.

The Penzance Rural Sanitary Authority have just offered the munificent premium of 20 guineas for "plans and estimates for the most efficient and economical mode of dealing with the sewage and refuse of the township of Marazion." The plans and estimates are to be accompanied by an explanatory report, the estimates to be given in detail, "and accompanied by a satisfactory guarantee or certificate that the work can be done for the amount named," and "should also show separately the approximate cost (and how calculated) of private works to dwelling-houses, &c. The estimate should also show the probable subsequent cost of working, and how arrived at."

After selecting the plan, "The authority will then take measures for bringing plans selected under the consideration of the Local Government Board, who will *probably* direct a local inquiry by one of their inspectors into the propriety of carrying out the scheme, and the author will be expected, *without charge*, to attend such inquiry, and explain and support his plans and estimates, and in the event of the Local Government Board approving the scheme, either with or without modification, *but not otherwise*, the author shall be entitled to the premium of twenty guineas, and the plans, with all documents accompanying same, shall become the property of the authority." Furthermore, "The authority hold themselves entirely free to entrust the execution of the work to whomsoever they choose to appoint."

A correspondent of your contemporary, *Engineering*, says the scheme reminds one of that adopted by costermongers, who in order to incite their donkeys to activity tie a bunch of grass to the end of a pole, and the pole to the donkey's headgear, the unapproachable grass hanging before the donkey as a perpetual bait. Surely an engineer who responds to the request of the Penzance rural sanitary authority is little higher in the scale of intellect than the quadruped referred to, and should in Dogberry's language, "be written down an ass." I quite agree with him—and am, &c.,

C. E.

THE NEW CITY VEGETABLE MARKET.

Sir,—I observe that in your issue of the 10th inst., under the head of "Chips," it is stated that the designs of the new Vegetable Market were prepared by me. Permit me to say that this is erroneous, Mr. Horace Jones, the City architect, being the author of the designs. The drawings were made by the staff in the office, as usual; I, however, had very little to do with them.—I am, &c.,

A. Murray, Chief Assistant.
Architect's Office, Guildhall, E.C., Oct. 15.

[Our authority was the report in our issue of July 25, p. 98 of current volume, in which Mr. Felton, chairman of the Schools Committee, is declared to have stated to the City Court of Common Council on the previous day that "The competitors for the City School had appeared unwilling to accept the report on which the committee had been advised by Mr. Murray; but members ought to know that only a fortnight since the Court adopted without discussion the plans prepared by Mr. Murray for the fruit markets, estimated to involve an expenditure of £115,000, whereas the whole outlay on the schools was not to exceed £51,000."—Ed. *B. N.*]

A GOOD THING AT DERBY.

Sir,—When a really good thing is offered, I think it is hard lines to keep it to the architects of one town—don't you? I quite envy Derby architects the following splendid chance:—

Derby Mechanics' Institution.—To Architects.—The committee of the above institution are prepared to receive plans from architects practising and having places of business in the borough of Derby, for the erection of an institution and buildings, &c. Plans to be sent in under cover of motto or sign on or before Friday, 7th day of November at 6 p.m., addressed to the Chairman of the Building Committee, marked "Plans for Building." Further information as to accommodation required may be obtained upon application to the Secretary, at his offices, 7, Corn Market, Derby. The committee do not bind themselves to accept or adopt any plan.—By order, Fred. L. Sowter, Secretary. Derby, October 6th, 1879.

I wonder if there is any entrance-fee charged by the committee? Perhaps some Derby reader can tell us. Envious.

THE LATE SIR GILBERT SCOTT.

Sir,—Could you oblige me by inserting the following in your next issue:—

"Being anxious to obtain all the information I can respecting the life and works of the late Sir Gilbert Scott, I should feel it a great kindness if any of your readers would favour me with the names of any books, journals, &c., bearing upon the subject. I am familiar with the work published by his son."—I am, &c., Walter W. Roff.

Heath-street, Hampstead, N.W.,
October 14.

A DISTINCT LEVELLING STAFF.

Sir,—The woodcut accompanying my letter in your issue of last week was not an accurate copy of the drawings (one full size and one of the woodcut size) which I sent you.

The figures should have been each formed in five equal portions, each figure being in height one-tenth of a foot, and each portion of a figure two-hundredths of a foot, thus forming a scale of the figures capable of being easily read to the one-hundredth of a foot.—I am, &c., J. Corbett.

THE ETHICS OF ADVERTISING.

Sir,—Some modern fellow not long since wrote to you wanting to know why architects should not go in for advertisements of their capabilities and that sort of thing, just as if the old men of the 13th century ever advertised! My brother, the Reverend Theo, says they go in for it in the church, and he doesn't see a bit why your columns should not be used in the same fashion as those of the clerical papers. I think, don't you know, we ought to keep it to the professional papers, however; but some don't. Here's a specimen I have just cut out of a paper called the *Northern Echo*, dated October 9:—

Eugene E. Clephan, architect, surveyor, and builder, North-end Steam Building Works, Stockton, begs to intimate that he has purchased from the Executors of the late Mr. C. J. Adams, F.R.I.B.A., Architect, the Goodwill, Plans and Specifications, &c., connected with his practice as an Architect and Surveyor. Plans and Specifications prepared, and Estimates obtained in competition. Surveys made. Plans prepared and Estimates given free of charge.

One of the parties mentioned in the advertisement used to be secretary to the Association just about the time I left it, because the fellows there used to chaff one so when I wanted to read a paper going in for 13th-century dress, and suggesting that we should have one of the conversaziones arranged to illustrate it—all the fellows to sit on rushes round a fire in the middle of the room, and that sort of thing. But executors all seem awfully modern—just like those people I had to deal with in Sweetbriar Gardens before I got sick of the whole business.—I am, &c.,

Georgius Oldhousen, F.S.A.

HORSE-SHOE ON CROSS.

Sir,—I have received from the Rev. A. Earle the promised photograph of the cross of Fovant Church, showing certainly an unmistakable horseshoe, with nails strongly marked.

I have to thank him for his courtesy, and must confess to some apparent lapse in that respect on my own part in writing too hastily, and I fear it may be thought flippantly, in the belief that I had fallen on one of those strange misconceptions of which in a long forty years of archæological observation many instances have met my knowledge on the part of both laymen and clerics, professional and non-professional antiquaries. As regards Mr. Earle's remarks on my writing under initials, I think that unless a name be of such authority in a discussion as to carry great weight, which I have certainly not the vanity to attribute to my own, it savours of impertinence to use more in the way of signature when addressing a public journal than will serve to individualise the writer.

With respect to the horseshoe, I think that either this cross has been the gift of some local iron-worker, employed, perhaps, on the metal-work of the building, or that this has been the cognisance of some single contributor, or of some guild or fraternity contributing to the cost of the church. It may be possible, but I think not likely, that it has been a whim to express the Omega in this shape.

Reference to local histories, county or diocesan, which no doubt exist, would very probably afford a clue to the solution of the question.—I am, &c.,

13th October. H. P. H.

CHIPS.

At the last meeting of the West Ham board of guardians, it was reported that Mr. Gregor, of Ilford, whose tender had been accepted the previous week for the extension of the workhouse, had withdrawn the same, as a portion of the work had been omitted from his estimate. It was proposed that the tender of Mr. Cox, who erected the workhouse schools, be accepted at £12,830. It appeared that the tender of Messrs. Hatton, at £11,860, was the lowest, but the architect, on being appealed to, showed that this firm were engineers and not regular builders, and he was certain the work could not be done for the amount they had quoted. Mr. Cox's tender was then unanimously adopted, and it was agreed to advertise for tenders for the remaining works connected with the hospital extension, and also for the small-pox hospital.

At a recent meeting of the Wandsworth vestry, a letter was received from Mr. Beeston, an architect, complaining that the design for the new vestry hall, accepted in the recent competition, was not in accordance with the specification. The clerk was instructed to reply to Mr. Beeston, stating that the Board saw no reason for supposing him to be damnified by their action, and informing him that the cheque for £15 returned by him was lying at the clerk's office, at his disposal.

The drainage committee of Harwich town council met the other day, to consider a report from Major Brine, R.E., of the War Department, officially condemning as defective the concrete lining of the new storage reservoir in Barrack-field. The chamber is formed on Government ground, and the concrete is required to be absolutely water-tight, in order to prevent the sewage from percolating into the water of the troops at the Redoubt and Barracks. It was decided to have the work reconcreted.

The foundation-stone of the new town hall at Reading, about to be built alongside Mr. Waterhouse's building (which is inadequate to the town's needs), from the designs of Mr. T. Lainson, of Brighton, will be laid on November 4th by the Earl of Carnarvon.

A school of art was inaugurated at Downham, Norfolk, last week. Mr. E. S. Beecroft has been elected master.

Intercommunication.

QUESTIONS.

[5918.]—**Valuations.**—1. Can any one tell me of a really good work, giving reliable information as to the valuation of heritable property? 2. Does a valuator require to be "licensed"?—Valuation.

[5919.]—**Tarred Wood.**—Will some reader give me the result of his experience as to the effect of tar on wood—does it preserve it? I have specified the under-framing (10 years old) of a wooden bridge over a river, all above water-line, and also the underside of the new pitch-pine cross planks to be twice tarred, the top of the planks being asphalted for roadway, made up with chalk, gravel, &c., and have been told that the tarring is worse than useless. I am also told that weather-boarding stands better and longer without being tarred. Is it so? If tar is recommended, what tar, and how many coats should be used, and how often re-done?—Agricola.

[5920.]—**Road Surveyors.**—I should be very glad if any reader would kindly inform me of a good work on the duties and powers of a road surveyor, and any works treating of county, parish, and occupation roads, also of such Acts of Parliament as would be useful for reference to a—Road Surveyor.

REPLIES.

[5907.]—**Damp.**—"P. D." says that sleeping with his windows open in all weathers has never done him any harm. I should like to ask if doing so in damp, foggy weather has ever done him any good?—C. F. M.

[5913.]—**Water Freezing.**—Would it not depend on the velocity of the water through the pipe? The average velocity through a 9in. pipe, supplying a population of 8,000, would probably be about 16in. per second, but would vary between 24in. during some hours of the day, and 8in. during the night, if it is a main from which water is directly drawn. This lesser velocity would not be sufficient to prevent the water from freezing. The greater velocity of 2ft. per second would probably do so. Why not, then, substitute for this short length of 9in. pipe one of a smaller diameter, through which the water must pass more quickly? If the diameter were 5in. the minimum velocity would be about the same as the maximum through a 9in. pipe—that is, 2ft. per second. The loss of head due to the greater velocity during some hours of the day through the smaller pipe would not be more than 1½ft. through the short length of pipe stated in the question, and this might well be sacrificed to secure an uninterrupted flow during frosts.—C. S.

[5914.]—**Licence for Valuing Dilapidations.**—A person who values dilapidations or any artificer's work is an appraiser under the Appraiser's Act, and requires a £2 licence, and he must write the amount of his award on a stamp, the value of which depends on the amount of such award. "Manx" contends he is not an appraiser. If so he cannot be a valuer, for if he refers to any "Dictionary" he will find appraiser, one who makes a valuation, and vice-versâ as to valuator, one who appraises or sets a value on any thing. This same question was asked and answered by your "Intercommunication" column a few months since.—Jas. Shilcoach, Surveyor.

[5915.]—**Greenstead Church.**—In answer to "W. H. W.," the church at Greenstead is, I believe, fairly well known. A description, with plan and view, is given in Sir Gilbert Scott's "Lectures," vol. ii., 54—56. The manner of construction, probable date and the shelter it afforded to the relics of St. Edmund, in 1013, are included in this account.—W. S. W.

[5917.]—**Surveyor's Charges.**—The usual charges for surveying and laying out a building estate is generally from 2½ to 5 per cent. on the outlay, according to the amount. It is generally determined by arrangement. Many surveyors charge a percentage on the first year's rental, and this is perhaps the fairest mode.—G. H. G.

CHIPS.

A serious strike has occurred amongst the joiners of Paris, of whom there are over 20,000. Meetings of masters and men have respectively been held, and on both sides resolutions have been arrived at that a compromise is impossible.

The foundation-stone of a new college to be built close to Newnham college, and to be known as Ridley College, is to be laid at Cambridge to-day (Friday).

Waterloo-bridge was illuminated for the first time with the electric light on Friday evening. Each alternate gas-lamp is fitted with the light, and a large standard has been placed in the centre of the road at the Strand end.

At the Bristol county court on Friday a bankrupt named King, who had carried on an extensive business as a builder, came up to pass his public examination, and it was stated that his liabilities were nearly £7,000 and his assets *nil*. The bankruptcy had been brought about by protracted and costly litigation with the Corporation of Bristol, who were creditors for upwards of £4,000. Only one creditor appeared, and the bankrupt passed his public examination.

The inaugural meeting and distribution of prizes at the Bow Science and Art Class took place at Fairfield-road Board school, Bow, E., on Thursday week.

A contagious diseases hospital has just been commenced for the Biggleswade Rural Sanitary Authority. Mr. Raines is the architect, and the cost will closely approach £2,000.

STAINED GLASS.

Brighton.—A stained glass window has been recently erected in St. Anne's church, Brighton. The subjects illustrated are the Nativity and the Angels appearing to the Shepherds. The window was designed and executed by Messrs. Heaton, Butler, and Bayne, of Garrick-street, Covent-garden, London.

Clevedon.—The large west window of Clevedon church, Somerset, has recently been filled with stained glass. The subjects illustrated are in the upper part "The Transfiguration of Our Lord," and below the subject of "The Last Supper." The window was designed and executed by Messrs. Heaton, Butler, and Bayne, of Garrick-street, Covent-garden, London.

Dublin.—A three-light window has been placed in Christ church, Leeson-park, Dublin. Three events from the life of Joseph are illustrated in the glass, which has been designed and executed by Messrs. Heaton, Butler, and Bayne, of Garrick-street, Covent-garden, London, W.C.

WATER SUPPLY AND SANITARY MATTERS.

Abergavenny.—On Monday week the Improvement Commissioners held a special meeting to consider schemes for sewering the town. Mr. Dudley, C.E., of Westminster, who had been consulted by the sanitary committee, strongly recommended that the sewage of the town, in conjunction with that of Cantreff, Langhorn, and Hereford-road districts, be taken to Ynysyball Field, on the Coalbrook Estate, for filtration. Objection, however, had been raised to this by the owner of Nantoer House, and Mr. Dudley had therefore prepared an alternative scheme, by which the sewage would be conveyed by an aqueduct 5ft. above flood level, across the river Usk, to land on Llanforist farm. Here he suggested it could be treated by the intermittent downward filtration process. The second scheme was estimated to cost £1,400 more than the first; but the commissioners resolved to adopt it, subject to the consent of the Local Government Board, and Mr. Dudley was appointed engineer at 5 per cent. commission and travelling expenses.

Barnoldswick. — The parochial committee, to whom is intrusted the duty of providing a water-supply, having failed in their negociations for the right to use certain streams, are now carrying out boring operations with a view to a supply. The work is under the superintendence of Messrs. Brierley and Holt, civil engineers, Blackburn, who have also prepared a sewerage scheme for this district.

Croydon Sewage Farm.—An arbitration was opened on Monday at the Surveyors' Institute, Great George-street, Westminster, before Mr. J. Clutton, between the Croydon Local Board and J. Beddington and others, the object being to ascertain the price which should be paid for 176 acres of land in the vicinity of Croydon, now leased to the Board for sewage farm purposes. The Board has acquired the freehold of certain lands adjacent to the Bennington Estate, and in 1870 took a lease of the latter property for 21 years at £10 per acre for the first 10 years, and £12 per acre during the remainder of the term. The necessities of Croydon now render it desirable that the Local Board should exercise the compulsory powers of purchase it has acquired since entering on the lease. In the course of the inquiry it was stated that the population has risen from 20,355 in 1851 and 30,229 in 1861 to 69,000 at the present time, and the rateable value which in 1851 was £62,126 is now £350,000. The price asked for the land is £300 per acre, the total being £52,800.

Water-boring in Whitechapel.—The boring at Messrs. Mann, Crossman, and Paulin's (Albion) brewery, in the Whitechapel-road, has been brought to a satisfactory conclusion, the test-pumping having failed to reduce the quantity of water in the bore-hole. The boring, which has been lined from top to bottom with 7in. wrought iron tubes, has been executed by the well-known system of the Diamond Rock Boring Company, in which the cutting process is effected by the revolution of a steel ring set with black diamonds projecting at angles from the tool. The boring at the Albion Brewery was commenced in December last, and is 12in. in diameter at the surface. The strata passed through was surface earth, gravel, London clay, Woolwich and Reading beds, chalk, flint, and grey chalk, and the greensand was reached on July 19. The boring was continued 20ft. in this stratum, the diameter of the bore being 7½in. The water rises to within 105ft. of surface, and has a temperature of 54° Fahr. Deducting stoppages, the time occupied in boring was 20 weeks. The work has been executed under the supervision of Mr. J. T. Jones, C.E.

Yardley.—The sewerage works which have their outfall on the Cole Hall estate, and are intended to provide for the sewerage of Sparkhill, Greet, Hay Mills, Coventry-road, and Stechford, were last week handed over by the contractor to the Solihull Rural Sanitary Authority. The works have been designed by and carried out under the general supervision of Mr. E. Pritchard, C.E., of Waterloo-street, Birmingham, and Westminster, S.W. During their construction they were under the local charge of Mr. C. L. Green, and afterwards Mr. C. Lewall, C.E., as resident engineers; but their final completion was under the immediate supervision of Mr. Pritchard, and his assistant, Mr. A. Fairlee. The original contractor was Mr. James Bush, of Ulverston, who commenced operations in April, 1878, and by July, 1879, had executed a considerable portion of the works. At the latter date, however, he terminated the contract, and the Sanitary Authority relet the unfinished part of the works to Mr. George Law, of Kidderminster, who very quickly completed the whole.

LEGAL INTELLIGENCE.

Caution to Builders.—At the Wallasey petty sessions, on Wednesday, before Messrs. G. B. Kerferd and Marshall Bulley, Mr. Somerville Jones, the clerk to the Wallasey local board, appeared on behalf of that board to prosecute Mr. John Andrews, of Victoria-road, Seacombe, for infringing the building by-laws by "building a dwelling-house without having in the rear an open space exclusively belonging thereto to the extent at least of 200 square feet, and so that a distance of not less than 10ft. intervene between the whole line of the extreme back of such house and the extremity of the yard, free from any erection thereon above the level of the ground." Mr. J. T. Lea proved the case, and the defendant was fined in the mitigated penalty of 10s. and 8s. 6d. costs. Mr. S. Jones also appeared in support of a summons against Mr. William Williams, of Rowson-street, New Brighton, for infringing the by-laws "by allowing two houses, newly erected in Belmont-road, New Brighton, to be occupied before giving notice to the board that the same were ready for occupation, and so enable the surveyor to enter and inspect the same for the purpose of satisfying the board that the drainage, ventilation, and other matters over which the board have control were in a satisfactory condition, and that such houses were fit for human habitation." The defendant was mulcted in the mitigated penalty of £2 and 8s. 6d. costs.

CHIPS.

The Great Yarmouth School Board adopted at its last meeting designs for new schools for the north district, prepared by Mr. J. T. Bottle, of that town. The buildings, which will be Gothic in style, will accommodate 500 children at an estimate, exclusive of fittings, of £6 per child.

A large granary has just been completed at the Southtown Steam Flour Mills, Yarmouth. It is of six floors, each 50ft. by 36ft. Mr. Davy was the architect; Mr. Wilson, of North Walsham, the builder. The machinery is on the Hungarian principle, and was supplied by Messrs. Riches and Watts, of Norwich.

At a meeting of the Literary Society of Axminster, held on Friday week, the question was discussed of the suggested formation of science and art classes in connection with the society. It was stated that the nearest classes are at Yeovil, Bridport, and Exeter, distances so great as to be prohibitory. It was decided to form classes, but to have them independent of the Literary Society. A managing committee has since been appointed, and the classes will be opened at once.

Special services were held in St. Giles' Cathedral, Edinburgh, on the completion of the restoration of the Preston aisle, including the removal of the division between it and the high church, and of the Chapman or Montrose aisle.

The local board of Stroud, Gloucestershire, last week raised the salary of their surveyor from £100 to £150 per annum.

Between two and three miles from Ware, on a hill looking towards the village of Wadesmill, an obelisk has been erected at the cost of Mr. Arthur Giles Puller, of Youngsborough, to mark the spot on which, in June, 1785, Thomas Clarkson first resolved to devote himself to the abolition of the slave trade. The ceremony of unveiling was performed on Thursday in last week by Miss Merivale, daughter of the Dean of Ely; and Dean Merivale, who 45 years ago stood on the spot with Clarkson himself, and heard all the circumstances from his lips, told the story in a very simple and unaffected manner.

The memorial-stone of the Royal General Dispensary new building was laid in Bartholomew-close last week. The new buildings, from designs by Mr. W. Ward Lee, will cost about £8,000. The new building would include dispensary, waiting-room, consulting-room, apartments for resident medical officer, and other rooms.

Our Office Table.

An entirely new clock is about to be made for Hampton Court Palace by Messrs. Gillett, Bland, and Co., of Croydon, who have also been commissioned by Her Majesty's Government to restore the ancient astronomical dial so that it can perform its original functions. The dial has the date 1540 upon its back, but the actual manufacturer has not been discovered, although the archives of the British Museum have been searched. About 40 years ago M. Vulliamy, the clockmaker to the Crown, was instructed to set the dial going, but he did not succeed, and since that time the dial, which shows the signs of the Zodiac, the movements of the heavenly bodies, &c., has been stowed away in a workshop at the Palace. The difference between past and present chronometer clockmaking is illustrated by the fact that the Hampton Court clock used to be reckoned a good timekeeper, though it lost 15 minutes in 24 hours.

In the summer of 1878 delegates were nominated by the Royal Institute of British Architects, the Society of Telegraph Engineers, the Physical Society, and the Meteorological Society "to consider the possibility of formulating the existing knowledge on the subject of the protection of property from damage by electricity, and the advisability of preparing and issuing a general code of rules for the erection of lightning conductors." The delegates have held several meetings, and have already collected, firstly, from the manufacturers of lightning conductors, and, secondly, from the members of the Royal Institute of British Architects, a large amount of thoroughly practical information. Several of their number are also engaged in forming abstracts of the salient features of the literature of the subject. The members of the conference are, however, most anxious that their report should be as trustworthy and as exhaustive as possible, and they have therefore asked us to assist them by publishing this epitome of their proceedings, and allowing them to invite correspondence upon the following points:—Full details of accidents by lightning, stating especially whether the building struck had a conductor or not. If there was a conductor, state its dimensions, construction, mode of attachment to building, whether its top was pointed, distance of its upper terminal from the place struck, nature and extent of the connection between the conductor and the earth, and whether the earth was dry or moist, whether the conductor was itself injured, and whether the conductor or the point struck was the most salient object in the vicinity. Information is also desired, either verbally or by sketches, as to the position of metal spouting and lead roofing relatively to the point struck and to the conductor. Details of the thickest piece of metal melted by a flash of lightning are much needed. Unimpeachable evidence of the failure of conductors is much desired, as such failures would be extremely instructive. Communications should be sent to Mr. J. Symons, F.R.S., secretary to the conference, 30, Great George-street, S.W.

Great things are talked about the approaching exhibition of William Hunt's pictures and Samuel Prout's which Mr. Ruskin is organising in Bond-street. A number of people have readily offered the specimens, and the difficulty will be to arrange so many. Mr. Ruskin is going to write some notes, partly critical, partly, no doubt, autobiographical, and wholly interesting, on the pictures in the collection which is being got together in his name. Those who send contributions have, therefore, a good chance of having their possessions immortalised by one of the greatest writers of pure English prose of the present, or, indeed, any previous time.

On the subject of the obstruction of one hundred and fifty of the leading thoroughfares of the Metropolis by means of bars and gates maintained by the owners of the local property, a conference of delegates from the Vestries and District Boards of London took place last week in the St. Pancras Vestry Hall. Special reference was made to the obstructions on the Bedford estate, by which communication with Holborn and the great railway termini on the north side of London is interrupted and diverted. It was finally resolved that a deputation should to-day memorialise the Metropolitan Board of Works to give the subject their urgent consideration.

The autumn Congress of the Sanitary Institute of Great Britain will be held at Croydon next week. The proceedings commence on Tuesday with a public luncheon at 1 p.m. and at 3 p.m.; the exhibition will be opened by the Chairman of the Local Board of Health. At 8 o'clock, Dr. B. W. Richardson, president of the Congress, will deliver an opening address. On Wednesday, at 10 a.m., Dr. Alfred Carpenter will speak on "Sanitary Science and Preventive Medicine," and papers and discussions on the subject will be continued till 5 p.m., a conversazione concluding the day's engagements. On Thursday, "Engineering and Sanitary Construction" will be considered. The opening addresses of the section will be delivered by Captain Douglas Galton, and papers and discussions will follow, Professor Corfield giving an evening lecture. On Friday, the subjects "Meteorology and Geology" are to be introduced in an address by Mr. G. J. Symons, and in the evening a public dinner will be held. Saturday will be devoted to excursions. The lectures to the Congress and the general meetings will be held in the large public hall, and the sectional meetings in the small hall adjoining. The exhibition will be held in a marquee erected at the Central Croydon station, and will remain open until Saturday evening, November 8th.

In a letter to the *Times*, Mr. J. H. Colls says:—"By reference to those journals of last week which have to do with the building trade, it will be found that between 30 and 40 contracts were let, amounting to a total of about one million of money; and, as these were all within a radius of a few miles from London, it would appear that in this particular department there is likely to be a fair amount of work during the winter season, especially when it is remembered that it is becoming more and more the custom to arrange for the best work privately with the builder, so that the amount of those works does not get published in the trade journals. Perhaps, as the state of trade is now the most constant topic of conversation, the above facts may be worth publishing."

A meeting in support of the motion to open the Guildhall Library on Sundays was held on Wednesday at the Guildhall Tavern. The chair was taken by the Rev. Canon Shuttleworth. Speaking of himself as a recent convert to the views entertained by the members of the Sunday Society, by whom this meeting was convened, the chairman said that he could not see how any man could be aware of what went on in the publichouses in London on Sunday without throwing himself into this movement. Mr. Mark H. Judge, hon. sec. of the Sunday Society, said he had but lately returned to town from attending the conference held last week in Manchester. The opening of the public free libraries of Manchester on Sunday had been attended with great success, and it was remarkable that those who 12 months ago opposed the opening of the libraries on Sunday, as contrary to their religious convictions, no longer raised any objections—a proof, he thought, of the good the change had been found to work. An unexpected result of the conference in Manchester had been to lead to the opening of the exhibition of paintings in the Royal Institution in that city. Mr. Lewin Hill moved, "That this meeting of persons resident or engaged in business in the City of London is of opinion that the time has arrived when the Guildhall Library should be opened on Sundays in consequence of the undoubted public advantages which have attended the Sunday opening of libraries in several of the large provincial towns, particularly in Manchester, where, as in London, a large number of the population are absent from the city from Sunday to Monday. This meeting, therefore, trusts that the Court of Common Council will agree to make such arrangements as may be necessary for the opening of the library of the Corporation of the City of London during some hours on Sundays." The resolution was carried unanimously.

On the Belt Railway, U.S., there is a "soft place," which the Americans call a heavy fill, at the east end of the long pile work which forms the eastern approach to the Lower Belt Bridge. The latter was constantly sinking into the swamp, and has been raised from 6ft. to 8ft. since the track had been laid down two years ago. The piles west of this sinking bank have been sunk a few inches too. One aspect of this subsidence is—says the *Indianopolis News*—worthy of attention. The eastern end of the pile work is filled in with dirt for some 40ft. or 50ft., to serve as a sort of abutment. This filling not only sinks into the swamp, but drifts to the south, so that the track has been shifted more than once northward on the caps of the piles to preserve the line of the rails. The extreme eastern row of piles has been forced by this strange earth drift so violently southward that the southernmost pile has broken loose from the track altogether, and stands off at a large angle in the bank. The power of this pressure will be better appreciated when it is understood that the piles and the caps are bolted together by large drift bolts that enter 2ft. into the tops of the piles. The southward motion was powerful enough to break this bolt and force the pile clear out from under the track. What is this mysterious but vigorous motion? The filling of dirt as it sinks into the swamp bulges the surface up until in some places it is several feet higher at the foot of the bank than it is 20ft. or 30ft. away. Albert Scott, superintendent of transportation of the Belt road, thinks the company will fill in the whole length of this pile work, about 1,000ft., before long.

The London-bridge terminus of the Brighton Railway has during the last twelve months undergone a complete transformation as regards its internal arrangements for facilitating the ingress and egress of trains, with such complete success that, without the necessity for purchasing any additional land, the accommodation of the station has been almost doubled. The old-fashioned notion of setting apart certain platforms on one side of the station for arriving trains, and certain other platforms on the other side of the station for departing trains, is exploded. Every platform is now available equally for all trains, either for arrival or departure. The working of the traffic is greatly simplified, and no less than four trains can run side by side in and out of the station at one time. This will obviate the provoking delays to the express trains which not unfrequently, after a splendid run from Brighton, were stopped outside the station to await the starting or shunting of some other train out of the way.

The Alexandra Estate, Muswell-hill, comprising some 270 acres, is bounded by the Alexandra Palace grounds on two sides, and to which there are two entrances from the estate. The property stretches from the Wood-green station on the Great Northern Railway on the one side to the pretty district of Muswell-hill on the other. The estate has been laid out for building purposes, the roads having been well constructed and the sewers and surface drains have been designed on sanitary principles and in accordance with the requirements of the Tottenham Local Board. The situation is one of the most beautiful in the north of London, and is conveniently situate close to five railway stations on the Great Northern and Great Eastern Railways, affording easy and cheap access to the City, West-end, and other parts of the metropolis. The estate is well adapted for the erection of superior villa and other residences, shops, &c., and affords an an opportunity to capitalists, investors, builders, and others of acquiring remunerative and rapidly-improving freehold land. Plans, particulars, &c., can be had of Mr. E. E. Croucher, of 38, Southampton-buildings, Chancery-lane, and 223, Seven Sisters-road, N.

Among the miscellaneous exhibits on view this week at the Dairy Show we noticed a very useful kind of filter near the entrance to the hall. It is called the "High-pressure Self-cleansing Filter," and is manufactured by J. Halliday and Co., of Manchester. We may describe it as being a cylindrical vessel attached to the water-main, and having beds of filtering material in the centre, graduated from coarse to fine, the latter being the centre bed. As the water is admitted be turning a tap into the lower part of the cylinder, it filters through the beds of carbon and is drawn through a pipe fit for drinking. By a further movement of the tap the stream can be reversed, and a pressure is put on the opposite side of the filter which washes out all the impurities arrested in filtration. We noticed the condition of the water filtered and the water drawn after the action had been reversed. Nothing could look brighter and more sparkling than the filtered water drawn into a clear glass tumbler, while the latter, after the beds had been cleansed of impurities, looked quite cloudy and dark. These filters can be applied to any house service pipe. They are made from £2 2s. for one tap, a $\frac{1}{4}$in. pipe, of a capacity to filter 100 gallons a day, up to a size capable of filtering 10,000 gallons per day. For ordinary domestic purposes one tap is sufficient.

A new theatre was opened last week at Geneva, and is said to be one of the handsomest and largest structures of the sort in Europe. In external appearance it greatly resembles the Opera House at Paris, being built in the same style, while the decoration and arrangement of the interior are almost as lavish. The vestibule, which fronts the Place Neuve, is connected with the first *étage* by two flights of stairs with balustrades of red marble, and stuccoed, ornamented panels, lighted by splendid candelabra representing a group of children, the work of M. Carrier-Belleuse. The upper part of the staircase walls and the ceiling are painted; one scene, by M. de Beaumont, depicts the four Seasons; another, by M. Dufaux, the four Elements; and M. Léon Gaud has contributed several allegorical figures. The five doors which give access to the first gallery are supported by busts of Plautus, Voltaire, Shakespeare, Racine, and Sophocles. The crush room immediately over the principal entrance, and lighted by three balconied windows, is one of the most remarkable parts of the theatre. The floor is in variegated *parqueterie*. The prevailing tint of the wainscoting is light chamois. The *chefs d'œuvre* of the room are the carved chimney-piece in the style of Louis XIV., bearing in the centre the arms of Geneva and surmounted by a bust of Apollo; and the mural paintings by M. Milliet, representing the comic and the tragic Muses. The auditorium is in keeping with the rest of the house. The three tiers of galleries have an outward inclination, the lowest tier being in advance of the highest. The auditorium is lighted by a lustre, with 400 bronze burners. The seats are upholstered in red velvet, and the lower parts of the walls are papered or painted to match. While precaution has been taken to prevent fires, the amplest facilities for exit are provided, and the theatre can be emptied of its occupants in a few minutes, so numerous are the doors and so spacious are the staircases and corridors. Twenty-eight jets of water at full pressure are always ready to be directed on any point of danger, and by means of iron curtains and doors one part of the house can be immediately cut off from the rest. The cost of this temple of Thespis has been defrayed from the proceeds of the Brunswick legacy, and, including the value of the land on which it is built, exceeds 5,000,000f.

The American Social Science Association met at Saratoga from September 9th to September 12th. In the sanitary department, Colonel Geo. E. Waring, Jr., gave an extended address on the "Sewerage of Village Cities." In the discussion which followed Prof. Acland, of Oxford, England, was invited to speak, and made an eloquent address, in which he described sanitary methods in England, and expressed his satisfaction at the progress which the people of the United States were making in sanitary science. He said that Americans had an excellent opportunity to profit by the blunders of England in such matters. "The Sanitary Condition of Tenement Houses" was the theme of Dr. Russel, of New York; while Mr. Chas. F. Wingate reviewed the history of the Tenement House Reform movement in New York of last winter.

The Rev. Bryan King writes to the *Guardian* from Avebury, Calne: "A very interesting discovery has just been made in our church. My son, two friends, and myself were taking down the large west gallery, when we discovered two Saxon windows in the walls of the nave. They have never been glazed, but have rebates with orifices for hinges of shutters on the outer surface, and have apparently been walled up since the beginning of the twelfth century. These are some of the remains of the church noticed in 'Domesday Book,' which was in all likelihood founded by one of our Saxon kings, the entire manor of Avebury being then 'Terra Regia.' It is so far a happy circumstance that, through our slender means, we are reduced to 'labour, working with our own hands,' in preparing our church for its renovation, since the above discovery would certainly never have been made by ordinary workmen. May I not add that this same circumstance should plead on our behalf for assistance in our work with all who take an interest in Avebury, this unique treasure of England?"

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Holloway's Pills are especially recommended to all annoyed by tender bowels, a source of constant weakness, if not indicative of danger. Diarrhœa, flatulency, nausea, spasms, and distention, yield to the extraordinary power this purifying medicine exerts over digestion and those subservient functions which extract the food's nutriment for the body's maintenance.—[Advt.]

THE BUILDING NEWS

LONDON, FRIDAY, OCTOBER 24, 1879.

THE CROYDON SANITARY CONGRESS.

THE autumn congress of the Sanitary Institute, now being held at Croydon, was opened by Dr. W. B. Richardson, on last Tuesday, in an inaugural address remarkable alike for its ability, and the power of popular illustration which so distinguishes the discourses of that gentleman. As we give the leading passages of the address in another column, we may here merely say that Dr. Richardson indulged in sketching, with all the power of his vivid imagination, another ideal of a healthy community, which he has called this time not Hygeia, but "Salutland." Dr. Richardson would transport us to a period removed from our own by nearly 200 years to a region happily designated as New America, where the people reached a full natural life of one hundred and thirty years, were governed under a free and enlightened commonwealth, subjected to common laws for the common health, to a country where there is no one capital and no seat of Government, but where every city has held equal rights and privileges, which are all moderate-sized, and where five separate dwelling-houses to an acre of land and five persons to a dwelling-house constitute the maximum population. The houses, like those sketched in his previous picture of Hygeia, are all built on arches raised above the ground, surrounded by gardens and parks; indeed, Salutland, as a whole, says our author, may be compared to one vast garden, in which all that is unclean is cast out. The workhouse, the gaol, the hospital are banished from this ideal region, while Paris, Rome, and even Athens are supposed to live again in this new world, and thus to recall the illustrious past. Of the architecture of this region of health and independent life we are told that the profession is one which vies in splendour, and that the "immortal mediæval architects themselves might wonder at what is to be seen when they behold the new work which Sanitation has imposed on the architect, and which, with earnest sympathy and consummate skill, he has striven successfully to sustain." Art of every kind finds a genial home and ample encouragement, but of details the president does not vouchsafe us much. Other papers on Preventive Medicine, read at the Congress, are fully reported elsewhere; but the president's address alone, of which we have sketched the barest outline, affords ample material for thought. His lucid remarks on the full longevity or constant of human life are extremely interesting and suggestive.

But we may more particularly confine our remarks to the very complete exhibition of sanitary appliances and objects of domestic economy now on view at the skating-rink, and from a hasty inspection of the exhibits we may observe that the collection is amply varied enough to afford interest to all connected with building in its varied aspects—sanitary, social, and domestic. Entering the main portion of the Exhibition, that in the canvas rink, we find sanitary and artistic skill combined in the splendid standing of Messrs. Doulton and Co., of Lambeth, who, in addition to their beautiful specimens of Lambeth faience and fine-art pottery and tiles, exhibit a variety of sanitary stonework. In the latter we see excellent latrines, w.c.'s, lavatories, &c. The painted tile lavatories are very striking. Mr. George Jennings, of Stangate, exhibits a few specialities. His patent valve-closet and trap, with separate overflow, the Bramah trapless closet with ball overflow, his patent valve closet and trap in one piece of earthenware, the tip-up lavatories, and especially the intermittent flushing cistern with coil pipe, each coil being a trap, and his self-acting inclosed urinals for offices, billiard-rooms, &c., will be found to well repay inspection. The ball trap is an ingenious, and as it appears to us, an excellent substitue for the ordinary trap; the ball is of indiarubber, and fits to a seat of the same material, and is so sensitive to the slightest action of gas, that it presses tightly into its seating. The model bath room is fitted up with large glass, a lavatory, a bath, and w.c., cased in polished mahogany, and the room is papered with a glazed blue paper with a tile pattern, and presents an air of sanitary completeness and luxurious fitting that is positively inviting. T. Smith and Co., of Old Kent-road, stand No. 89, present some excellent specimens of sanitary stoneware; and H. Braithwaite's (Leeds) patent siphon for w.c. cisterns calls for special notice. The siphon is applied to a usual cistern divided into two compartments with a small aperture in the partition, one compartment having the usual ball-tap. The small or regulation compartment has the service pipe brought over and bent into a cylinder in which a piston works which is actuated by a weighted lever. The piston being pulled up by the chain pull forces the water into the bent pipe and the siphon is set in motion; no valves or holes are introduced or bored in the bottom or sides of cistern, and there is an obvious simplicity conducive to economy and durability. The chief peculiarity in the plan is that the service pipe passes over the side instead of *through* an aperture in the cistern. Stand 93 is noticeable for a porcelain bath in one piece and a self-acting w.c., manufactured by J. Finch and Co., of Buckingham-street, Strand; and No. 99, for specimens of rock concrete tubes for sewers and wells. These have socketed joints. Messrs. Wilcock and Co.'s siphon traps, Woodhead's ventilating trap, and Burmantoft's faience in stand No. 175 are worth notice; the tiles exhibited show some good patterns and colours. Edward Brooke and Sons, Huddersfield, send invert-blocks and subsoil pipes, cisterns of earthenware and sanitary tubes, many of excellent quality. Of sanitary ash-closets there are several. We note a few: The Sanitary Appliance Company, Salford, show a good model of a patent cinder-sifting ash-closet; Moule's Earth Closet Company contribute a variety of their well-known closet apparatus, the models exhibited showing a hopper, pull-up apparatuses, and various means of filling the hopper and emptying the receptacles from behind, the results of experience. Moser's self-acting portable dry earth commodes (118) are also worth notice in this department. Stand 164 (Keen and Son, Croydon) has a trapless water-closet connecting with open soil pipe; and close to it Messrs. Capper, Son, and Co., of Gracechurch-street, exhibit some excellent twin-basin w.c.'s with new joints, the chief point of which is that the earthenware outlet is moulded with a flange that fits into a socket of lead in the floor of the closet, avoiding all risk of gas leakage. The joint is a patent of Brian Jones, and by securing the basin to the soil pipe obviates the destructive action of rats and mice to which the putty joint is exposed. In this department of appliances we have only room to notice Beard, Dent, and Co.'s (Strand) sanitary work in stand 79; H. Owen's single and double-trapped apparatus cisterns, &c. (156); Jewell's system of house drainage and ventilation and double siphon house and sewer traps with gullies, good in principle but too complicated; Messrs. Warner and Sons' (Cripplegate) overflow waste and bath apparatus, &c.; Dodd's apparatus, &c.

In objects of constructive interest to the architect, the Exhibition at Croydon well repays inspection. Concrete building is the subject of two or three noteworthy exhibits. We especially draw attention to Henley's patent "safety revolving and self-fastening concrete building apparatus" exhibited in stand 61 by the Concrete Apparatus Company, of Blackfriars-road. The model we inspected certainly presents the essentials of success: there are no costly stays, the walls are raised within frames of plates or boards which are secured by pivots or bolts to the angle standards, and which can be turned up to another height as the process of filling in the concrete is continued. The system is exceedingly simple: when the second layer of concrete is to be laid the plates and standards at the angles of the walls are revolved, or turned round, on the bolts which secure the top, and the lower sides of the plates then become the top edges, and are fastened by their slotted ends to other bolts in the standards, and the process of filling resumed. We notice also an ingenious mode of flue coring, by which the flues can be formed in the body of the wall, and the core extracted as successive heights are needed. Henley's sash fastening, with no spring, is an excellent contrivance for securing sashes, and drawing them close together at the meeeing rails. The Patent Victoria Stone Company exhibit several specimens of their admirable patent stone; the paving and medallion are capital specimens of the hardness and stone-like qualities of the composition, which is applicable to sinks, pipes, and every conceivable sanitary and architectural requirement. Mr. Lascelles, of Bunhill-row, sends a patent movable hut; but his special exhibits are in Stand No. 86, where we see a capital floor of concrete slabs, stamped to a good design, a cleverly-designed chimney-piece in Queen Anne, the mouldings of which are as sharp and perfect as any of wood, a concrete bath, some excellent street paving and kerbing. Mr. Lascelles has, since we first inspected his productions in concrete, largely perfected the system he has carried out so successfully. S. and E. Ransome, of Essex-street, Strand, show a large number of specimens of their solutions for preserving stone and resisting damp, also of their "porous stone" filtering slabs, and a few ornamental objects of architectural interest. Mr. Henry G. Brace, of Lordship-lane, in No. 7, exhibits plans of a house and villas, showing a good system of ventilation. The "Tie-Brick Company" show specimens of their patent tie-brick buildings. We note in Stand 77, a smooth paving by the Patent Ferrunite Company, Portsmouth. A few well-designed deflecting ventilators are shown. We have only space to casually glance at Sinclair's self-acting gas-valves and governors, Ellison's conical ventilators, a form of inlet to which we have before referred, and No. 45, Adam's patent window fastening, &c. The Broomhall Tile Co. (137) show some specimens of their tiles and sanitary appliances well known to our readers, and the Silicate Paint Co. have a large stall filled with samples of their silicate and enamel paints. Several other exhibits we must refer to next week. All who have leisure to spare will find the Croydon Exhibition a very interesting one, and a very fair index of invention and scientific progress in sanitary construction.

THE COMPETITIVE DESIGNS FOR ST. MARY'S CHURCH, WOOLWICH.

THE designs sent in by a limited number of competitors for the proposed new church of St. Mary's, Woolwich, were on view this week. From a hasty inspection of them, we are enabled to lay before our readers the result of the labours of the architects selected by the committee. We understand the design of Mr. James Brooks, of Wellington-street, Strand, has been accepted. Mr. Brooks has submitted a set of drawings for this church in every way worthy of his skill as one of our leading Gothic architects. His design is distinguished by the usual merits of vigour and boldness, and is conceived in the spirit of Early French in many of its details, though parts, especially the west front windows, remind us of Selby. The plan comprises a nave of five bays, and a chancel, raised two steps, of three bays in length, with aisles and transepts, the latter being very slightly broken from the line of aisles. There are two western towers crowned by plainly-treated octagonal spires, the angles being emphasised by bold turrets of octagon shape, finished with spirelets well-grouped round the base. The very excellently-drawn ink perspectives from the south-east point of view given of the design does justice to the composition, which is well grouped, cathedral-like, and dignified in its parts. The east end has a gable with flanking turrets, pierced by a finely-grouped series of five lancets inclosed under a relieving-arch. The projecting vestries and organ-chamber on the south side are gabled in three bays, and, with the gabled end of chancel aisle, form a pleasingly-grouped whole. The west gable between the towers, one intended as a memorial tower to those who perished in the *Princess Alice*, is pierced by a large triplet-window. This front is shown by a cleverly-drawn sepia perspective. Mr. Brooks's interior, also illustrated by a masterly-drawn perspective, is equal in every way to the exterior. The arcades have piers of circular form, surrounded by engaged shafts, 6 to each; the capitals to the latter are enriched by foliage of Early Decorated character, and the arch moulds adorned by the dog-tooth ornament. The lofty triforium and clerestory of plain lights, with cusped circles over, has an air of dignity well becoming a parish church; the wall spaces between the latter and the arcade being proposed to be relieved by frescoes of figure-subjects in panels. This treatment of the triforia is at least a sensible one, though expensive. There is a plain-groined vault with ribs carried by triple wall-shafts, and these spring sufficiently low to divide the fresco decoration into panels. Open benches with framed leg-ends are shown. The east end is broadly treated, and the fine 5-light window with a tier of three lights below it has a rich though quiet effect, enhanced by a well-designed reredos in three compartments. The groined aisles and the pulpit and other adjuncts are well in keeping with a clever though perhaps rather costly design. Several elevations to a large scale (3-16 of an inch) accompany the design, and an alternative view is offered showing one spire at the west end. We understand that Mr. Brooks's perspective drawings were prepared by Messrs. A. H. Haigh and Maurice B. Adams.

Another able design bears the name of Mr. E. Francis C. Clarke, architect, of Serjeant's Inn, whose design for remodelling the interior of the old fabric has already appeared in these pages. Mr. Clarke's design is essentially different to that just described. It is thoroughly English in spirit and detail, and of far more moderate pretensions. The plan is cruciform; there is a nave of four bays, side aisles, and transepts slightly pronounced, a chancel of two bays, vestry and organ chamber on the north side, and aisle on the south. At the west end there is a baptistry with side porches. The arcade is shown of low proportions with circular shafts, and the height from ground-line to the boarded ceiling looks rather low after Mr. Brooks'. Accommodation is provided for 1,200 worshippers. Looking at the external design, we find the author has gone in for a low, square tower, with a pyramidal tiled spire over the crossing, at one corner of which is a bold turret with spirelet. The windows and detail generally are of Early Decorated character; we hardly like the treatment of the clerestory windows with the blind arches, and must express our preference for the treatment adopted in the perspective view of the church from the north-west, showing plain lancets with cusped heads.

Clever and vigorous perspective views accompany the drawings, one showing the west end and the other the east. We confess a preference to the plain-tiled roof. A coloured view of the chancel is sent, showing some pleasing coloured decoration in panels to the groined ceiling over. We hardly like the east window end. The author fills up the arched spaces over the chancel aisles beneath groining with open tracery, and the effect is good. Another designed marked B shows a rather different arrangement, with the present tower utilised at the west end up to a point below the belfry stage; but we do not think the design suitable. The transept in this design is groined in two bays; and the long nave looks low. The arrangement gives accommodation for 1,000, or with chairs 1,150. A sketch design marked C shows the new arcade and roofing proposed by Mr. Clarke in a Romanesque style, and which were exhibited at the Royal Academy.

A striking design for a cruciform arrangement having a lofty nave of five bays long, with long transepts of two bays, and chancel, the latter and north aisle being groined, is sent in by Mr. J. W. Walter, architect, of South Molton-street. Choir and clergy vestries are shown on the south side of chancel. The elevation shows an Early English structure with lofty clerestory pierced by single lancets. The tower and spire are placed at the centre of west end, and form a porch; the spire is low, and has octagon pinnacles at the corners. The transept treatment, with its geometrical window, is out of keeping with the nave and east end, both of Early Pointed detail. An alternative design is submitted, illustrated by a well-drawn pencil interior, groined in Early Pointed style. In the last arrangement the chancel is made narrower, and the arcades at the crossing converge. The drawings exhibited show careful detail. A set of designs is also contributed by Mr. T. N. Laslett, architect, of Walbrook, the principal feature of which is the side tower, which is placed on the north side, and is finished by a singularly-designed gabled parapet. The plan is a cross, with long nave of about 125ft., and narrow passage aisles, west narthex, and gallery over, and two western entrances. The tower adjoins the north transept, and the baptistry is placed on the opposite side of the church, adjoining the south transept. There is a long chancel and choir aisles, and the nave and aisles are shown groined. The walls are proposed to be built upon the old foundations. The perspective shows flying buttresses and octagon low-capped turrets at west end, but the detail and proportions are below par, and the design is too florid in character. We hope shortly to illustrate the selected design.

MATHEMATICAL DRAWING INSTRUMENTS.*

A CASE of mathematical drawing instruments forms one of the most necessary items in the stock-in-trade of the architectural student, and an elementary introduction to the use of instruments, despite one or two good treatises upon the subject, has been a desideratum. Mr. F. Edward Hulme, F.L.S., F.S.A., Art-master of Marlborough College, an old contributor to our own pages, and the author of some suggestions in Floral Design, illustrated and reviewed in these pages, besides other works on ornament, has endeavoured to supply the want, and we have on our table a small octavo treatise entitled "Mathematical Drawing Instruments, and How to Use Them." From a glance through the pages we believe Mr. Hulme has been successful in putting before the student the most necessary principles involved in the construction and use of drawing instruments, and that as a technical handbook it bids fair to supersede other more elaborate treatises written from the purely mathematical or instrument-maker's side of the question. The general fault of books on this subject has been that they give only technical details, and leave the student much in the same condition of bewilderment and ignorance about the real use of instruments that he was in before. Their study tends rather to confuse and to mystify the mind, and to leave it in a hopeless state of dissatisfaction. The aim of a manual of this sort, meant to be really of service, should be to regard the instrument merely as a part of technical drawing, to view the subject, in fact, from the architect's or engineer's side, rather than from the instrument-maker's. Mr. Hulme has apparently looked at the matter from this point, though we should have been glad to have read less about the instrument box and its completeness, and rather more of the importance to be attached to the eye and hand of the student, of the value of using as few instruments as possible, especially in drawing curves, where the hand and eye should be more depended on. The first chapter deals with instruments used in the production of straight lines, such as the ruling pen, the T and set squares, dotting wheels, and some useful hints are given regarding the selection of a ruling pen, such as that care should be taken to see that the nibs are of equal length and of sufficient thickness so as not to cut the paper, the mode of drawing lines, &c. We find our author refers to the Army Examination Paper tests, and recommends the test given for the use of the ruling pen, which is to draw a square with half-inch sides and to draw others outside it at a third of an inch apart, each successive square being lined in with thicker lines than the one within it. The value of this problem to the novice in drawing is no doubt great, though, we think, the best test of the use of the ruling pen are drawings themselves, besides being less likely to become irksome. The rules on inking-in given are judicious and of a practical kind that will be appreciated by the draughtsman, so also are the hints on resetting the ruling-pen when the nibs are worn, which will be serviceable to the student. He will he glad to know, for instance, that a piece of common slate and a little water will often be found sufficient. We cordially agree in the remark that a desirable feature in a pen is that the lower part of the handle be made square, which at once insures steadiness and direction. For beginners the square must be of considerable value. The method of using the T square will be found a useful chapter; the author prefers pearwood, as being cleaner than ebony and mahogany, and less liable to warp. Brass-edged T squares are not spoken of favourably, nor can any one who has ever used them and found out their defects do so. One common defect not mentioned by the author is that the brass edge becomes springy, and a true line is rendered impossible. On the use of the "set-square" several excellent suggestions are given that will be found of service by the student; the means of testing the accuracy of the angles are also given, and the illustrations show the learner how many constructions of an ornamental and useful kind may be performed by its use. Though vulcanite squares are well spoken of, pearwood is preferred. Besides set squares, reference is made to a series of similar instruments called "batters and slopes" for drawing the slopes of cuttings and the batters of walls, very useful to the engineer, and also another kind called "pitches" a sort of set square for drawing the pitches of roofs. Drawing-boards, those very indispensable requisites of the architect, are discussed: our author advises three boards, one of 31in. by 22in., another of 22in. by 16in., and a third of 16in. by 11in., as useful sizes. These are suitable for the three sizes of drawing-paper, imperial, half-imperial, and quarter-imperial. Our experience is that for architectural purposes the last is too small, while a board to suit a sheet of double elephant or antiquarian is a necessity. The remarks on the liability of boards, especially large ones, to warp and twist, and the best means of obviating this defect are apropos. The "centrolinead" and "excentrolinead" are not forgotten; but, strange to say, the author dismisses the former with scant notice, and does not give the method of setting or using the instrument, certainly an omission, as our own pages of "Intercommunication" will testify, for if we have had one question put more often than another, it is an inquiry respecting the method of using the centrolinead. The excentrolinead is, of course, used only for drawing lines of divergent character; and is made on the same principle as the rolling parallel ruler, in which one of the wheels can be exchanged for others of different sizes. The value of lines in drawing is made the subject of a few remarks, though this part might have been aptly enlarged by illustrating the use of instruments as applied to architectural design. The necessity and advantage of freehand drawing, especially in details like mouldings and ornament, is more impressed upon the architectural designer as his experience extends. He gradually finds that his instruments fail him in the production of those designs upon which the most thought and artistic refinement have been spent. The author very rightly calls the human hand a drawing instrument; we may go further and say it is the only universal instrument, and that the more complex and varied the design is the greater is its value felt and the less can we depend upon instrumental aid. We fully endorse all the remarks about the various kinds of bow compasses, and the exceeding vexation of using a compass with an imperfectly fitting pen point, an experience that most draughtsmen at one time or another must have felt. In most cases the defect arises from the socket being too large. Ourselves, we prefer the screw form of fixing to the spring. The importance of having the compass so jointed that the pen point may be made to work perpendicular, or nearly so, with the paper is another obvious point which the beginner is apt to overlook. We may also observe that plain needle-pointed instruments are better than those in which needles are introduced, as these are always slipping and require considerable force to grip them tightly. We see no allusion to this. Chapter VI. deals with ellipses and means of describing them, the trammel, the string method, the conchoidograph for drawing curvatures of very slight flexure, as the entasis of a column, French curves, &c. As regards the latter we have not much faith in set curves, and two or three patterns may be made to answer all the purposes required. To our minds the most useful section of Mr. Hulme's treatise are the chapters treating on the division of lines and scales. Many of the hints, though not new, are destined to save a large amount of time. The division of a straight line, for example, into any uneven number of parts can be performed geometrically with precision. A line is drawn from one extremity of the line to be divided at any angle and length, with any distance the given number of parts are set off with the dividers, and a line is drawn from the last of these to the other end of of the line to be divided. Parallels drawn to this from the other divisions give the desired points. The methods of dividing circles into 3, 4, 6, 8, 12, and some other numbers based upon them are simple and easily remembered. Few things in the architect's instrument box are so little understood as the scales of ivory usually supplied with it, and we know several talented draughtsmen who are not ashamed to admit their ignorance of the meaning and use of the intricate series of lines and figures found upon them. We refer more particularly to the line of chords, the protractor, and the diagonal scale, and the sector. The diagonal scale, for instance, is really a valuable instrument of division when rightly understood, as by its means units, tenths, and hundredths of a foot or yard, etc., may be determined with considerable accuracy. The construction and use of the diagonal scale is very simple, and is thoroughly explained by the author. As questions in examinations are generally given in decimals, the value of this scale has acquired fresh importance. The sector is another puzzle to the student, but is really a very useful instrument when understood, and may be employed to construct scales or to enlarge or reduce drawings. Various scales are upon it; thus the scale marked L is the "line of lines," and may be employed for dividing lines into equal parts and proportionals, and the principle is based on the 2nd problem of the 6th book of Euclid. "If we want to divide a line 3½in. long into 9 equal parts, we first open the sector until the distance from 9 to 9 is equal to the length of the line. Then from one extremity of the line we set off the distances 8-8, 7-7, 6-6, and so on, and the line is divided as desired." Many other examples are given of its use, as of finding a proportional to two given lines, and for reducing plans to any proportion—an operation exceedingly easy. Another part of the sector is marked POL, made use of in constructing polygons; and is equally simple to understand. The author shows how figures of any number of equal sides can be drawn; he also describes the use of the line of chords for the determination of angles, &c. Hints for mounting and straining paper and the preparation of Indian ink will be found interesting chapters to the student and young architect, and we can recommend the work to those who want to become rather more than mere users of the instruments they employ.

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* Mathematical Drawing Instruments, and How to Use Them. By F. Edward Hulme, F.L.S., F.S.A. London: Trübner and Co., Ludgate Hill.

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THE BRADFORD TECHNICAL SCHOOL COMPETITION.

ARCHITECTS were recently invited to send in drawings for a technical school to be built in Bradford, and five per cent. commission on the cost was offered to the architect selected to carry out the work, £50 for the design which came second, and £25 for the design which was considered the third best. In response to this invitation fifteen sets of drawings were sent in, and the award has just been made, by which Messrs. Hope and Jardine are selected to carry out the work, their design being placed first; that of Messrs. Healey Bros., being placed second (obtaining the £50 prize), and Messrs. Hargreaves and Bailey taking £25 as the third prize. All the prize takers are of Bradford. One of the conditions of the competition was that plans should not be coloured, yet each one of the designs which obtained a prize is coloured, making of course much more showy pictures, but affording pretty plain proof of forgetfulness on the part of the Council of their own instructions.

We will take the premiated designs in order:—"Continental A" (Messrs. Hope and Jardine), shows the main entrance in Great Horton-road, with a well-lighted lecture-hall on the right, filling up the angle of the site, and seating 740 people, the platform of which has its back to Carlton-place. The ladies' cloak-room is at the opposite side of the entrance-hall from the lecture-hall, and separated from the Secretary's room by an ill-lighted passage (lighted only by a borrowed light) that leads to the curator's room, store-room, extra class-room, and council-room, which, with the ante-room and Secretary's room front to Great Horton-road. A small ticket-office is partitioned off from the Secretary's room; a fine staircase is provided in the entrance-hall, under which another passage leads round the lecture-hall to the students' entrance from Carlton-place, which has another entrance to the lecture-hall, but it is so far from the ticket-office as to be practically useless. There are, however, convenient ante-rooms for the lecturer adjoining, with lavatory and w.c., and a door from the students' entrance in Carlton-place. The right of the students' entrance is occupied by rooms for hand-loom weaving, dressing and twisting, and room for power-loom weaving, all well lighted with a top-light, and an entrance from each into back yard. There is also a workshop, spinning-room, and spinning class-room similarly lighted, and four class-rooms facing into Carlton-place. The corridor between the weaving-rooms and class-rooms is very ill-lighted, however, having only a light from a skylight at the extreme end of the passage. There are capital lavatories, &c., in connection with the weaving-rooms, but none for gentlemen attending lectures, or for members of the council. It should be mentioned here that the conditions stipulated that "Machinery in motion and all motive power must be away from the class-rooms." In neither of the three selected designs has this clause been properly borne in mind, and the arrangement adopted is not only at variance with the instructions, but opposed to previous practice—such for instance as that of Mr. Waterhouse at Leeds, in his new Technial Department of the Yorkshire College, where all such workshops are isolated from the teaching-rooms. On the first floor the principal staircase provides for an entrance into the gallery of the lecture-hall, with a room near containing lavatory basins and urinals. The gallery seats 270 persons. Over the council-room, &c., and very accessible from the principal staircase, is placed a museum and library, a very fine room 65ft. by 46ft. well lighted on two sides, with an instructor's private room over the entrance-hall, which would be better not there, as the passage would be then much lighter. Near the students' staircase is a laboratory and dyeing-room 52ft. by 38ft., another well-lighted room facing Carlton-place with chemical lecture-room 40 by 29ft. 6in., and demonstration-room attached and very cleverly arranged for light, &c. The second floor is reached by only one staircase well lighted. It provides only a gallery to the museum and four drawing and class-rooms connected with a dark passage; one is called an architectural and mechanical drawing-room facing Great Horton-road. The other class-rooms are well lighted. The elevations for this design have been removed, but the sections are thoroughly well got up in sepia. The other design by the same architects marked B is very similar to the one marked A. It has the entrance in the same place but with a much better lecture-hall facing Carlton-place and Great Horton-road, and a ticket-office attached to the principal entrance of the lecture-hall. The same position is assigned to the ladies' cloak-room, which is across the entrance-hall and, as before, entered from the dark passage which has some very dangerous steps in it, and leads to rooms exactly as in the design marked A. There is also a similar entrance from Carlton-place giving entrance to the lecturer's ante-rooms, but there is, as before, a sad want of lavatories, &c. The right of the students' entrance is occupied by hand and power-loom weaving-rooms, dressing and twisting-rooms, and spinning rooms, workshop, class-rooms, &c., but with the drawback that there is no separate entrance into the weaving-rooms. The first floor is approached by a wide staircase well lighted, but in this design the landing is make dark by building a room for the museum-attendant across it; an instructor's room is placed over the gentlemen's cloak-room, and another ticket-office is provided. A large museum and library, very well lighted all round, is situated over the council-room and faces Great Horton-road; a corridor leads to the chemical library and dyeing-room, and lecture-room, from which also access is obtained by the students' staircase direct from Carlton-place. The second floor contains the gallery of the museum and four class-rooms, with the same dark passage, and a museum-instructor's room. The elevation is Italian in style, very good upon the whole, with a very choice tower, but hideous arches, peculiar to Bradford, to the first floor windows. The elevation to Carlton-place is very fair, but cheapness seems to have been particularly studied in this elevation.

The design marked "Reims" received the second prize. The entrance is from Great Horton-road, and shows a great waste of room in the hall, and long tortuous passages to get to the lecture-hall, which is placed in the rear of the building with cloak-rooms, w.c., and lavatories, without any attempt at lighting. The council-chamber and two lecture-rooms and secretary's office face Great Horton-road on the left of the entrance, while a museum and library face the same road with convenient entrance from entrance-hall. The students' entrance is from Carlton-place, and leads to power-loom, weaving-rooms, spinning-rooms, and workshop, all top-lighted, and a dark corridor which leads to two class-rooms facing Carlton-place, a weaving and spinning room, and rooms for dressing and twisting. The first floor is reached by well lighted stairs of fine proportions. Three large class-rooms occupy the Great Horton-road frontage, and convenient access to gallery of lecture-hall is provided, but there is no ticket-office either up or downstairs. The w.c. and lavatory is very convenient for the class-room. A chemical laboratory is placed in a convenient position near the grand staircase, and also the students' stairs, with demonstrator's room attached, but connected with a quite dark w.c. and urinal close to the laboratory and dyeing-room 160 feet long, and three extra class-rooms. The students' staircase is well arranged and convenient. The elevations are very unsymmetrical—good specimens of Queen Anne completely spoiled by a dreadful tower. The detail, however, shows some study and great care has been bestowed on the elevations. A much better elevation is given to Carlton-place than the first-prize drawing A gives. The ornamental work in the gables, and over the arcade to the Great Horton-road front, is very elaborate, and it will bear close examination on all its fronts, except that to Lister-terrace, where a heavy building is supported on four corbels.

"Light and Air" is a poor plan. The entrance is again from Great Horton-road, with class-rooms on both sides, one of which has a circular end, and faces both Great Horton-road and Carlton-place. The entrance-hall contains a wide staircase, well lighted, and a passage under the stairs lighted only by a borrowed light, leads to two class-rooms, professor's room, with w.c. attached, also a workshop, boiler-house, and store-room, all facing Carlton-place; spinning and dressing rooms lighted from roof are placed in rear, and a large room 57ft. by 64ft. is provided for hand and power-loom weaving combined. There is plenty of room for extending the premises. On the first floor a circular lecture-hall is provided at back, with separate entrance, ladies' and gentlemen's cloak-room, lavatory and w.c. attached. A separate entrance is also provided for gallery staircase. The same entrance gives access to a large museum, 78ft. by 30ft., which is also approached by a grand staircase, and it adjoins a library, council-chamber, and secretary's office, which, together with store-room and w.c., face Carlton-terrace. Two spinning and weaving-rooms face Carlton-place, giving the elevations only a poor appearance, which are not improved by the style, which is of no particular period. "A. Z" (Mr. W. Hill, Leeds), sends two designs which certainly should not have escaped the attention of the Committee. The entrance is provided from Great Horton-road, and has a handsome portico, with curator's-rooms, secretary-room and council-chamber on the right of a splendid entrance-hall. The left is occupied by class-rooms, entering from a vestibule of noble dimensions, as do the spinning and weaving rooms and workshops on one side, and the library and museum on the Carlton-place side. A large lecture-hall, 66ft. by 46ft., is provided in the centre of the building, with ante-rooms, w.c., lavatory—all well lighted, placed very conveniently. All the power weaving-rooms, 76ft. by 28ft.; dressing and twisting-room, 31ft. by 23ft. 6in.; spinning-room, 32ft. by 23ft. 6in.; and hand-loom weaving-room, 66ft. by 26ft.; are at the back partly detached, and yet connected to main building very cleverly. The staircase, a fine circular one, leads to first-floor with laboratory and dyeing-room, and six class-rooms all well connected together as with the chemical lecture-room. There are no dark passages and no inconvenient steps. The elevation is in the Italian style with massive Corinthian columns and rich frieze and dome on top. "Comme il faut" is a fine specimen of the Queen Anne style (apparently by Messrs. Holtom and Connon) with an imposing front to Great Horton-road. A very fine entrance-hall from there leads to the chemical lecture-room on left, facing Great Horton-road. A council chamber and secretary's office attached are in a most convenient position on ground floor, and the museum and library are placed in the centre of the building, yet very well lighted from back windows. The weaving and spinning-rooms, workshop, and hand-loom weaving-shed face Carlton-place, while the machine-power weaving-shed is at back, lighted from roof. A good circular staircase leads to lecture-hall, museum, laboratory, and dyeing-rooms, which are, however, too far removed from the chemical lecture-rooms and other class-rooms, but it is a clever design on the whole, and well suited to the purpose required.

"Utility" is a very choice Italian design with square bays at each end of the front elevation to Great Horton-road. The design is rather too lofty, which is a fault common to many Bradford buildings. The plan is very compact, showing a museum in the centre of the building, around which are grouped class-rooms and weaving-rooms, spinning-rooms, &c. The lecture-room, 75ft. by 40ft., fronts to Great Horton-road, and is a very fine room. The chemical laboratory and lecture-room and dyeing-room are conveniently near, and the authors (Messrs. Mills and France) have succeeded in getting the mechanical and architectural rooms placed on this floor. The chief fault is that it would be impossible to add to the buildings at any future time. The plans are probably got up as well as any in the exhibition, except "Labor omnia vincit," by Messrs. Lockwood and Mawson, another Italian building with two small bays at sides and one large bay in centre, with very rich columns. This design shows the best elevation in the room to Carlton-place, and no pains have been spared in getting up the drawings in first-rate style, each of them being photographed, and the photographs and report neatly bound together. On the ground-floor a lecture-hall occupies a central position, and class-rooms provided around. No ticket-office is provided, but the workshops and weaving-sheds are very nicely situated in the rear, in a manner similar to A. Z. "Success to the Schools," by Jackson and Longley, has a lofty classical elevation to Great Horton-road, very much spoilt by unsightly towers and weak side elevation, with only a poor plan. "We Live and Learn" is an extraordinary structure, with bell turrets over each door, and a long straggling plan. "Lux" is not very happy in his designs; several mills in the neighbourhood would vie very well with it as architectural specimens; it has an entrance like a bank in China. "Carp diem" is a poor elevation, wonderfully enriched, and the front elevation would cost more than the building should. This is an attempt by Mr. E. P. Peterson, F.S.A. "Apropos," Messrs. Andrews and Pepper, has a clumsy, heavy front to Great Horton-road, with heavy fluted pillars built-in halfway up the building. This drawing is taken in the order that it is hung in, and not in the order of merit. "Diligence" shows too much roof, which detracts from the general design; otherwise it is better than many of the others, being light and elegant, with a good plan. "Theory and Practice" is the work of Messrs. Leeming and Leeming, of Halifax, and shows much careful thought in planning, but the elevation is indifferent; it is, however, wonderfully well drawn in black outline, and shaded in sepia, giving the whole a very pleasing appearance. These competitors have especially taken care to comply with the conditions as regards the arrangement of the several departments, and deserve credit for the success attained. "Laborieux" is a one-storied elevation to Great Horton-road, with a heavy roof and frieze that is very unhappy in effect; the plan is only so-so.

The site is a rather difficult one to utilise well in a building; but the designs are not so good as might have been expected, and by no means the best have been chosen.

CHIPS.

The borough buildings at Abingdon are in course of restoration. Messrs. Morris and Stallwood, of Reading, are the architects, and Messrs. Silver and Sons are the contractors.

The parish church of Tolleshunt Knights, Essex, has been restored, the work including the enlargement of the west window, and the laying of Minton's encaustic tiles in the chancel. Mr. James Durrant, of Colchester, was the builder.

A new cloth-mill and shed have just been completed in Mather-lane, Leigh, Lancashire. They are 241ft. 6in. by 130ft. 4in., and the mill portion is of five stories. The warehouses are in the main block of the mill, and are two stories in height, and the spinning-rooms are carried over same. The staircase, offices, closets, waste bagging shed, boiler-house, and engine-house are external to the mill. The engines are a pair of compound high and low pressure, and the mill is driven by ropes direct from the flywheel or pulley to each story. The structure is fireproof throughout, including the roof, which is covered with asphalte and has raised parapets, forming a shallow tank. Mr. J. J. Shaw, of Bolton, was the architect; Messrs. J. Collin and Sons, of Warrington, took the contract for the main structure, and Messrs. Homan and Rogers, of London and Manchester, executed the fireproofing.

A new gasholder and tank have just been completed at the Woodbridge gas works. The tank is 46ft. 8in. diameter, and 16ft. deep; and holds nearly 150,000 gallons of water; the gas holder is a few inches smaller in every dimension. The preliminary excavations and concrete foundations were undertaken by Messrs. Fosdyke and Son, Woodbridge; the tank and holder were constructed by Messrs. Clayton and Co., of Leeds, the whole being erected under the superintendence of Mr. B. D. Gall, manager of the gas company, at a cost somewhat under £1,500.

GLASGOW INSTITUTE OF ARCHITECTS.

The twelfth annual general meeting of the Institute was held this week in the chambers of the Secretary, St. Vincent-street. Mr. Campbell-Douglas, the president, occupied the chair. The secretary read the annual report, and Mr. James Sellars, jun., the treasurer, submitted his statement, which were unanimously adopted. The abstract of accounts showed the funds to be in a satisfactory state. In the report it is stated—

"The Institute resumed consideration of the desirableness of having a general Building Act for the United Kingdom, which was alluded to in last year's report. After mature deliberation the institute agreed that a general Building Act for the United Kingdom was urgently required in the public interest. Messrs. Douglas and Honeyman, who were sent as a deputation in connection with this matter to the Town Council of Glasgow, had repeated interviews with a committee of that body, when the views of the Institute on this subject were fully laid before the city authorities. In the proceedings before the Sheriff of Lanarkshire, under a remit from the Secretary of State for the Home Department, the Institute opposed—both by appearance and by written objections—the Provisional Order proposed by the Police Committee of the Town Council under 'The General Police Improvement (Scotland) Act, 1862,' and it is satisfactory to state that the Sheriff reported against the Provisional Order. This Institute and other kindred societies sent a remonstrance to the Town Council of Greenock against limiting the rate of remuneration to 4 per cent., when inviting competition plans for their new Municipal Offices; but this remonstrance, like the others, was disregarded. The Institute Gold Medal, offered last year for the best design for a library and reading-room suited for a small town, was not awarded, because the drawings lodged were not so meritorious as to justify it. A reward of books, however, was given instead. The President's Prize for the best series of drawings illustrating the portico of St. Andrew's Church was gained by Mr. James Wilson, in the office of Messrs. D. M'Kissack and W. G. Rowan, architects, in Glasgow. For the ensuing year, the Institute Medal will be awarded for 'the best design for a town residence, the building to form one of a terrace, say the corner house No. 1, or side of a square.' The President's Prize will be given for 'the best series of measured drawings, illustrating Hutchesons' Hospital buildings, Ingram-street.' The Council, as trustees of the Alexander Thomson memorial, have to report that a meeting of that trust was held on 16th April last. After recording the great loss the trust had sustained by the death of Mr. Charles Malloch, to whose sympathy and benevolent help the success of the scheme was greatly owing, the meeting appointed Mr. John Mossman, sculptor, a trustee for life in room of Mr. John Malloch. The draft trust-deed was agreed to be executed by the trustees as soon as £600 had been got in. To accomplish this the meeting appointed themselves a committee for raising subscriptions, of which Mr. John Shields is convener. It was reported that the funds amounted to £523 19s. 3d. after defraying the cost of the bust of the late Mr. Thomson presented to the city authorities and placed in the Corporation Galleries. As the funds were lodged in the City of Glasgow Bank, and thus only partially available, it was resolved to delay holding the first competition until the funds are in a more satisfactory state."

After some preliminary business had been transacted the Council of Management for the year was chosen, consisting of James Thomson, 88, Bath-street; John Baird, 113, West Regent-street; John M'Leod, 160, Hope-street; Matthew Forsyth, 191, West George-street; Campbell-Douglas, 266, St. Vincent-street; John Honeyman, 140, Bath-street; R. A. Bryden, 212, St. Vincent-street; Wm. Landless, 227, West George-street; Hugh Barclay, 136, Wellington-street; T. L. Watson, 108, West Regent-street. Before separating, a memorial from the Secretary of the Stone Carvers' Association, urging in the interest of good workmanship that stone-carving should not be sub-let by builders, but should always be a direct contract with the architect, was read and favourably entertained by the Institute. A meeting of the Council of Management took place immediately after the general meeting of the Institute. Mr Campbell-Douglas was re-elected president; Mr. James Thomson, 88 Bath-street, vice-president; Mr. James Sellars, junr., 266, St. Vincent-street, treasurer; Mr. John Burnet, 167, St. Vincent-street, auditor of professional accounts; and Mr. Wm. MacLean, writer, 196, St. Vincent-street, secretary.

THE SANITARY CONGRESS AT CROYDON.

[BY OUR OWN REPORTER.]

The Autumnal Congress of the Sanitary Institute of Great Britain is being held during the present week at Croydon. The general and sectional meetings take place at the Public Hall, and an exhibition of sanitary appliances, of which a critical notice appears in another column, is on view in the disused central station. The Congress is divided into three sections: I., Sanitary Science and Preventive Medicine, of which Dr. Alfred Carpenter, J.P., is president; II., Engineering and Sanitary Construction, Captain Douglas Galton, C.E., F.R.S., president; and III., Meteorology and Geology, Mr. J. G. Symons, F.R.S., secretary Meteorological Society, president. To each section is allotted a day for the reading of papers and discussion, No. I. being taken on Wednesday, No. II. yesterday, and No. III. will come on to-day.

TUESDAY.

The proceedings were opened at 1 p.m. by a public luncheon in the Public Hall, under the chairmanship of Mr. W. Drummond, chairman of the Croydon Local Board of Health. In the course of the subsequent speech-making, Dr. A. Carpenter proposed the toast of "Success to the Institute," and explained its aims and purposes. It was, he observed, only established within the last few years, in order to supply a want which had been pointed out by the Social Science Association—that of an organisation having as its purpose the instruction of the people in the principles of social science, of which one was health; an institute, in fact, had been provided which should give instruction, both public and private, in the science of prevention to all who were engaged in the work of prevention. He urged that no one ought to be allowed to act as a sanitary inspector who had not a knowledge of sanitary laws, and he hoped no one would be elected as a town surveyor who could not produce the certificate of competency issued by the Institute. The majority of sanitary officers at present had to learn the principles of sanitation from actual performance of their duties, and the Institute sought to remedy this defect. Its congress was now opened at Croydon because that was the first town to apply the principles of sanitary law. He called upon Dr. Richardson, as chairman of Council and president of the Congress, to respond to the toast. This Dr. Richardson did, and other toasts followed. At 3 p.m. the exhibition of sanitary appliances, which was still in a somewhat incomplete state, was formally opened by Mr. Drummond and Dr. Richardson.

DR. RICHARDSON ON "SALUTLAND."

In the evening the first general meeting was held in the large public hall, when Dr. W. Richardson delivered the presidential opening address, in which he carried his audience with him into Salutland, an ideal of a healthy people. Premising his imaginative journey by advancing the theorem, originally set forth by Flourens and developed by Owen, that the period of natural old age in the quadruped may be calculated on the basis of fivefold, the interval between birth and perfect maturity, he argued that man is destined by nature to live for one hundred years, and that until he realises this practically he is degraded below the brute creation. Even then there need not be death, but although the reserve be withdrawn, the forces in action will continue for some time, and to allow twenty years more is, he contended, to be just without being generous. Again, death is centripetal action, gravitation. Disease is injury upheld while yet the self-resistance to gravitation is in operation. Natural death is the gradual overweighting of the natural powers, reserve and acting, by persistent force that bears us down. How few sink naturally to earth from her final and gentle embrace! A centenarian is a subject of curiosity and criticism, so truly unnatural is the state of existence. The day has arrived when the cultivation of life by the cultivated of mankind is the primary art for the consideration of the cultivated. Sanitarians exist to protest against the casting away of nearly two-thirds of the life meted out to civilised man by a waste most destructive at the very budding of life, and continued between that budding and the prime. How then shall civilised man live that the natural term of his existence may be found? He would prefer, of the many modes of reply possible to adopt, that of a description which would hold the imagination while it conveyed the moral. After having built an ideal city, he would now create an ideal people that should show a model longevity, an ordinary term of life of 100, and prospective term of life of 120 years. In order to allow of the necessary conditions of time and space being fulfilled, let the bells be ringing-in the fifteenth year of the 21st century of the Christian era, and he would ask his audience to go with him to a point of the earth's surface at the extreme point of New America, to land in the independent commonwealth of Salutisland, more commonly called Salutland. It has now been in existence a century, but it has never once been engaged in war; it has at most produced some remarkable painters, sculptors, architects, musicians, and poets, and men of ability in science and literature: its inhabitants are also known as having a strange healthfulness and longevity, to which are added beauty, happiness, and good manners. There is no capital to this land; all cities have an equal right and an equal importance. In order that no city might claim priority, the original law-makers of the colony withdrew into the wilderness to hold conclave, and the spot, now enclosed and immortalised by a fitting inscription, is held in reverence as a place in which the builder must never apply his skill. In this "Silent Birthplace" have been placed one by one the statues of those who consecrated it as the centre of law, order, and holy life, and as it is a test of greatest work to be permitted to design and carve such statues, it is a true gallery of art. Further than that, there are no politics; every house is a capital; and a national convention is held quinquennially by turn in the large cities to settle the laws, an obelisk being set up in each to mark the event. This people possesses as few lawyers as politicians, public censors being chosen in turn to judge the land, and therefore little need for armed men, and even the healing professions are limited. A few true physicians of body and mind are appointed, both of men and women, and work without pay. Passing on to the social and domestic life of Salutland, we notice the number of their fine but moderate sized cities. A population exceeding 100,000 is considered unmanageable for health purposes. Five separate dwelling-houses to an acre of land, and five persons to a separate dwelling-house, is the densest population allowed. The houses, large and small, are all built, with varieties only of artistic design, on arches which raise them from the ground; the bedrooms are disconnected altogether from the living-rooms; gardens are all around, and gardens are on the roofs. Throughout the country the land is under cultivation for cereal produce, and fruit and vegetables. Through this cultivation there are interspersed magnificent parks and glades, in which harmless animals are free to wander. Animals are not consumed for food or hunted down, but still used by our model people. Their fleeces are used for clothing, their milk for food, and many of them are made to work. The roads leading from one part of the country to the other are maintained in the most perfect efficiency, smooth in all parts, and dry as our best asphalte of to-day. Transit along these highways on horseback and by velocipede has supplanted most other modes of personal conveyance. The lines of railway, once so general, have lapsed now into conveyance for heavy goods mainly. The cost of coal has rendered steam locomotive power very limited, while aërial locomotion has replaced steam-propelled carriages in a marked degree. But that which has effected the greatest change in respect to locomotion, has been the facility with which persons can converse by telephone at any distance from each other. The cities and towns are so constructed as to convey to the observer some classical conception of the illustrious past of the world. In favoured spots for the adaptation, great and wonderful cities have been revived in their pristine splendour, and with rigid truthfulness. Athens, with its Parthenon and all its ancient glories, lives again in this new world, on a seaboard equally beautiful. Paris, Rome, Cordova, and Salerno are recalled as they were when their learning was the glory of the world. In a new Jerusalem the Temple of Solomon, true to every inch of design and measurement, invites the curious. A modern Pisa has its leaning tower, and many of our own beautiful cities and historical towns, such as Bath, Edinburgh, and Stratford-on-Avon, rise before us in exact form and character, and London has its miniature. But in dwelling-places we lose sight of all that is either barbaric or sorrowful. Those four gates of our present cities of destruction, the asylum for the insane, the workhouse, the gaol, and the sick hospital, are as foreign to the inhabitants of Salutland, as the four gates of the walled cities of olden time are foreign to us at this hour. In some of the gardens outside the towns there are a few houses, not distinguishable from others, to which those who suffer from accident or disease are, if it be necessary, borne, and in which, with all that can greet the eye and make the heart light, these are fanned back into radiant health. There are also, in every city, a few houses, undistinguishable from the rest, in which those who are not able to provide for themselves are comfortably lodged as children, young or old, of the Commonwealth. So the sick hospital and workhouse are replaced. As to the gaol and the lunatic-asylum, they are disposed of together; the philosophers have concluded that crime and insanity are synonymous psychological conditions, and the criminal and the insane are removed to a separate colony called Hopeland, where they are suitably treated, and neither allowed to corrupt others or the parents of a tainted progeny. Turning to the people themselves, we note that at every period of life the body and mind have their natural work, rest, and play. Childhood is given up to growth and exercises; in the developing stage from 10 to 20 both sexes are educated together, no stimuli of prizes or examinations being held out; and not till after this period has been passed is aught but preparation for life's work undertaken. They neither injure themselves by work on the one hand, nor retirement from it on the other, and life runs out evenly and sedately. Every beautiful and refined art, every branch of natural science, is cultivated. Music holds the first rank in the arts. The stage, stripped of false trappings and cleansed from faults, is utilised to the grandest purposes. The sculptor finds the most splendid scope for his labours in the embellishment of public buildings, and in the memorial tributes to the dead. The process of disposal of the deceased is duplicate in form: they are either placed in newly-constructed earth, in which re-solution is of the most rapid character, or subjected to fire and reduced to ashes for the sepulchral urn. But though the body be destroyed, the remembrance of the dead is maintained by the sculptor's art in the "temples of holy memories." Architecture vies with sculpture in splendour, and mediæval architects would marvel much at its developments—more at the new work which sanitation has imposed on the architect. Here the true painter has found a home, and each town has its copy-gallery of some of the old-world masters, the touch of the master of antiquity being here reflected in the touch of every new master, however brilliant his own genius, or assured his fame for original conception and grandeur of execution. Science holds pre-eminent sway in Salutland. It is the unembodied Nestor of the teacher and the taught. To know is to exist, and science is knowing, existing. For the museums of science, the collections of the works of the Universal Father, the architect expends his best designing energies, the builder his finest work, the mechanist his choicest skill. Having explained that the physical health is tended with as much care as that of the mind, the lecturer narrated the results of the health and life of this ideal people, tracing their progress from the date of the immigration into Salutland. They are of mixed origin, Saxon, Keltic, and Jewish, and, therefore, healthy and vigorous; fortunate in climate and soil, they are chiefly engaged in agricultural pursuits, even the mechanic possessing a garden. Well educated, they have learned the elementary truths as to public health, know what are and are not healthy places, are acquainted with the history of diseases produced by uncleanliness, have become practised in the useful and innocuous distribution of sewage, and have seen the dangers that arise from pitching dwellings in damp localities, and in building with materials that absorb and hold water. Ignoring all thought of false economy, destroying by fire all carriers and sources of contagion, and providing for the instant isolation of every case of contagious or infectious disease, they stamped out the communicable diseases wholesale. They had learned three other great lessons: that all sanitary teaching is as good seed flying wildly before the wind so long as women are not employed to collect and utilise it; the golden mean 'twixt destitution and luxury; and that if manhood and womanhood are never assumed till they have arrived, the number of population will answer for itself according to ordained natural law. Then they instituted a grand inquiry, the instauration of medicine, to ascertain what diseases would and what would not get well without the aid of drugs, with astounding results. Another advancement was to decide that man was neither a herbivorous nor carnivorous, but frugivorous. The final perfection in the economy of life had relation to sleep and rest. The people had been proud of the success they had attained in producing artificial light, and had developed it to the exhaustion of their nervous system. At length the reserves of fuel for engines and bakeries from sheer extravagance began to fail, and the people were driven by an amusing demonstration performed by one of their professors to see the great advantage of availing themselves of natural light. When the sun, concluded Dr. Richardson, became the fellow workman of the people of Salutland, the redemption of their bodies from premature death was carried out with the fullest success. The people saved millions in money, but this was nothing to the other saving. Their nervous system found at last its natural time for work and for rest. All Salutland laid down like one vast living world to enter oblivion, and to wake from it filled with another spell of life, ready and happy to greet another day. The hundred years in Salutland were won.

WEDNESDAY.

THE FIRST PRINCIPLES OF SANITARY WORK.

The first section was opened by an address, by Dr. Alfred Carpenter, having the above title While he considered the principle of prevention ought not to be confined to diseases of the zymotic type, he would confine himself to pointing out that all the causes of these were absolutely removable, either by the State or by the individual. He entered very minutely into the communication of contagion by means of fungoid germs and also parasites to man, domestic animals, and plants, and the intercommunication of disease from one class of subject to the other, and with the aid of algebraical signs, formulated the theory of the particulate nature of contagia. This was, he urged, the first canon law. The protection against the conveyance of contagion was free ventilation. Motion of both air and water was a principal law of sanitary work, and he urged the necessity for the ventilation of the sewer, trap, and house-drain, so as to prevent any stagnation. A further law was, that there must be no direct communication between the sewer and the interior of the house. Houses built over sewers must sooner or later be dangerous to the occupants, and the builders of such houses should be compelled to notify the fact to every incoming tenant. Yet another law was, that sewage must be utilised, and be conveyed from among dense populations by water carriage, in sparse ones admixture with earth and so-called dry carriage was best. He had come to the following conclusions as to sewage: —1, that sewers are necessities for crowded populations; 2, that having sewers, they are silent highways, along which human excreta may be safely and efficiently removed by water carriage; 3, that sewer gases and smells from decomposing sewage are not necessities of the system; 4, that if sewage be judiciously applied to land, the spread of enthetic disease by its means becomes an impossibility; 5, that after a proper application by surface irrigation, the effluent water may be safely discharged into the nearest watercourse; 6, that the application of sewage to land must be conducted on scientific principles, otherwise failure, first financially and then by producing nuisance, will arise; 7, that a local board is the worst possible body to have the management of a sewage farm (a proposition which, coming from a medical man residing in Croydon, occasioned much amusement); 8, a local authority in providing for the utilisation of sewage by irrigation must be prepared to pay the difference in value between the price of the land and its ordinary agricultural worth; and 9, that although sewage should be conveyed to the soil as rapidly as possible, rainfall should go to the river. In conclusion, the author dwelt on two other laws of sanitary work —that sewer and water services should be distinctly separated so as to render no interchange of either liquid or gases possible, and that the individual house is the limit of sanitary work, and the individual care the unit of repression. He claimed that all these canon laws had their foundation in the particulate nature of contagion, and that only by bearing this fact in mind that sanitary work can be successful. Dr. Richardson, in putting to the meeting the vote of thanks to Dr. Carpenter, which had been proposed by Sir A. Brady and Professor De Chaumont, F.R.S., remarked that the paper had suggested a reconciliation of the germ and glandular theories, the one of which went upon the hypothesis that zymotic disease was invariably conveyed by contagion, the other that it was sometimes a poison capable of formation within the animal.

WATER ANALYSES.

Professor De Chaumont read a paper on some points with reference to Drinking-Water. In many cases of disease believed to be communicated by certain drinking-waters, it had been found impossible to find any impurity in the water either by chemical or microscopic research, while cases had been known of impure water being drunk for long periods without the occurrence of disease. Both forms of research had, he thought, been overrated and underrated. As to chemical analysis, attention had been concentrated on the amount of albumenoid ammonia instead of its character. As a general principle, if they were assured that the impurity in a sample of drinking-water was vegetable, the limits usually laid down might be considerably exceeded without its being necessary to condemn the water. The significance and origin of free ammonia had been misunderstood, and unnecessarily regarded as dangerous to health. He explained the many difficulties encountered in the analysis of waters owing to want of care and cleanliness in procuring samples, and said the best of all examinations was that made on the spot at the source of supply. Dr. Swete followed, with a paper on "The Interpretation of Water Analysis for Drinking Purposes," in which he also dwelt on the difficulty of obtaining correct analyses, and urged that it was not sufficient to draw definite conclusions from the bare chemical analysis, without regard being paid to the geological and sanitary surroundings of its source, and the microscopical characters of its deposit; indeed, chemical analysis gave no sufficient data for the condemnation or otherwise of a sample. He also described Dr. Dupré's and Dr. Wanklyn's modes of analysis. A discussion followed, in which spoke Prof. Wanklyn (who explained his albumenoid or moist-combustion method of analysis), Mr. Kinsey (who asked for cheap processes), Dr. Strong, of Croydon (who gave further facts), Mr. R. T. Stevens, Dr. Tatham (who inquired as to filters), Dr. Jacobs, and Mr. Mitchell. Dr. Carpenter, in closing the discussion, asserted that in no case of epidemic had disease been attributed to a water which chemical analysis had pronounced pure, and that therefore there was no reason to distrust present processes of examination. Dr. De Chaumont, in reply on the discussion, said that no rough-and-ready mode of analysis could be trusted; charcoal filters were often of use in purification, but had strong tendency to become more injurious than useful for want of cleansing, and they did not remove all impurities. Dr. Swete urged Professor Wanklyn to carry his slow-combustion experiments a stage further, when he believed they would be productive of much good.

In the afternoon a discussion took place on the temperance question, introduced by papers read by Drs. Norman Kerr and J. Ridge.

VENTILATION AND PURE AIR.

Dr. H. J. Strong, of Croydon, read a paper on "The Necessity of Pure Air in Living and Sleeping Rooms." The subject was dealt with from a medical point of view, the theory of good ventilation being elucidated, and the effects of bad ventilation pointed out. In closing, the author considered how best to secure ventilation in rooms when deficient or defective. The necessity for affording both an ingress and egress for the currents of air was insisted upon. The author thought that there is no better ventilation than the ordinary chimney, more especially if assisted by a fire; but some further means should be devised for getting rid of the products of combustion where gas was used. Mr. H. C. Burdett, sanitary commissioner, followed with a paper on

THE UNHEALTHINESS OF PUBLIC INSTITUTIONS.

He stated that the health arrangements of our hospitals and asylums are deplorably bad, and are becoming worse, and that investigation had proved that not 10 per cent., and probably not 5 per cent. of all the hospitals in England and Wales possess a reliable plan of the drains and sewers. The condition of our semi-public schools and colleges was generally bad, and sanitation in private schools was lamentably deficient. It was a disgrace that our charitable institutions compared so unfortunately with the gaols under Government supervision. He urged the appointment of a special sanitary inspector, whose whole time should be devoted to the inspection of the sanitary arrangements of public institutions. No resolution was proved in the matter. A paper by Mr. F. Nichols, on "Infant Mortality," closed the proceedings, and in the evening a conversazione was held in the adjoining large public hall.

THURSDAY.

PRACTICAL APPLICATION OF SANITARY KNOWLEDGE.

The opening address in Section II., Engineering and Sanitary Construction, was delivered by Captain Douglas Galton. While it was to the physiologist and chemist, he said, that we must look for the knowledge of the causes of disease and the conditions which must be altered to prevent or remove them, it remained for the engineer to design the methods by which prevention or removal shall be effected. The constant augmentation and crowding of the population rendered his duties increasingly necessary, and, at the same time, it became less easy for any one member of a community to separate his interest from that of his neighbours. Where many dwellings are congregated together, the requirements for health may be classed as—first, those that are common to the community, such as the supply of good water, the removal of foul water, and the removal of refuse matter; and secondly, those which immediately concern the individual householder, such as the condition of his house and the circumstances of its occupation. There are few subjects in which so many professions of progress have been made in the last few years as in the theoretical knowledge of how to provide a healthy dwelling and a healthy town. Books innumerable have been written upon the question; physiologists have invented every conceivable theory; patentees have devised every conceivable description of apparatus; engineers, architects, and builders overwhelm you with professions of their knowledge of sanitary principles, and millions of money have been spent in furthering the schemes they have devised; and yet, in spite of all these efforts, there are few houses and very few towns where you would not easily detect some grievous sanitary blunders. This he considered to be due, in the first place, to the fact that the majority of men prefer anything to thinking for themselves; the result has been that money has sometimes been expended upon theoretical suggestions which have later proved to be fallacies; the money has been wasted, and then discouragement has followed. In the second place, the sanitary education of the country has not been brought into a system. Important questions of drainage, of water-supply, of ventilation, have in many instances been committed to persons who had a good education in general architectural or engineering knowledge, in the nature and use of materials, and other such matters, but who had never received any special training in the sanitary side of engineering. In the third place, the system under which the Government advances money for sanitary works, whilst of great *primâ facie* advantage in one point of view, yet has its disadvantageous aspect. The facility with which corporations and local boards have been enabled to borrow money at a low rate of interest unduly precipitates action, and leads to waste of money, while the tutelage by the Government diminishes the responsibility of the local authority's engineer. The plan adopted by the Government in former times for promoting land drainage would have answered equally well in the case of sewerage works. If the Government, instead of becoming themselves money-lenders to towns on so large a scale, and thus constituting their inspectors the sole advisers on matters of drainage, had passed an Act of Parliament enabling any town to borrow an amount of money, bearing a due proportion to the rateable value of the town, a sound security would have been created; and if large companies had taken upon themselves the function of lending to towns under a system similar to that in force for land drainage, viz., of satisfying themselves, through the advice of a leading engineer, of the probable efficiency of the plans for which money was advanced, a greater scope would have been afforded for progress in sanitary science. We should have reached a higher level of sanitary improvement in this country if the Government had limited itself to its more legitimate functions, viz., first, the enactment of laws requiring sanitary defects to be removed; and second, the promotion of measures for diffusing a sound education in sanitary knowledge; instead of pursuing the course of endeavouring to dictate the exact measures to be followed in each case. What is sanitary knowledge? Too generally it is confined almost exclusively to drainage and water supply, but it is a far wider subject. The selection of a site requires a consideration of the temperature of the air and soil, what are the prevailing winds, the amount and incidence of rainfall, and the percolative capacity of the soil. After choosing the site, the nature of the subsoil must be regarded. A site with a high water level is, as a rule, more unhealthy than a site with a low water level; but a site with a fluctuating water level is most unhealthy. The sanitary engineer can control the water level in the soil, or construct works to remedy the evils of a wet site. The permeability of the soil to water, carbonic acid and other gases, renders it highly important that the soil should not only be well drained, but also free from decaying substances. When the site has been selected the sanitary architect has to consider how he will distribute buildings over it. The deteriorating effect of residence in densely-peopled towns is not due to the absolute numbers of population, but from absence of circulation of air through and between buildings, and from the retention near or in houses, and in streets of much polluting matter. The superior healthiness of the model lodging-houses over less densely-inhabited districts is due in a measure to the careful provision of sanitary arrangements, but principally to the fact that the numerous stories in these buildings are provided with free through ventilation, and allow of ample space all round for the circulation of air, as well as to the fact that impurities are not allowed to be retained on the open area round them. The health of any building is dependent upon free and moving pure air outside and inside its walls. Thus in towns where land is dear and a large number of persons are crowded on a given area, better ventilation and circulation of air may be obtained by placing dwellings in stories one above the other, and leaving spaces between the buildings than by placing them in one-storied buildings too close together to allow of circulation of air round the building. The next step in knowledge of sanitary construction is to learn how to obtain pure air in a building. To supply in a room a volume of fresh air comparable with that obtained out of doors, it would be necessary to change the air of the room from once to five times in every minute, but this would be a practical impossibility; and, even if it were possible, would entail very disagreeable conditions. To maintain the comfort and temperature we desire indoors, we sacrifice purity of air. Therefore, however impure the outer air is, that of our houses is less pure; and it may be accepted as an axiom that by the best ventilating arrangements we can only get air of a certain standard of impurity, and that any ventilating arrangements are only makeshifts to assist in remedying the evils to which we are exposed from the necessity of obtaining an atmosphere in our houses different in temperature from that of the outer air. But we might obtain much purer air than we have. Soot and many deleterious matters may be easily removed from smoke by passing it through spray on its way to the chimney, and until such a system of purifying town air is adopted, we can improve the air in our houses by removing the suspended matter from the inflowing air by filtration, and as the suspended matters exist in much smaller quantities at an altitude, and our public buildings might easily be supplied with fresh air drawn from the highest points possible, instead of from just above the street level, as was the common practice. The maintenance of the standard of purity, or rather impurity, in a building, depends on ventilating arrangements, but whatever the cubic space, the air in a confined space occupied by living beings may be assumed to attain a permanent degree of impurity, theoretically dependent upon the rate at which emanations are given out by the breathing and other exhalations of the occupants, and upon the rate at which fresh air is admitted. The same supply of air, therefore, will equally well ventilate any space, but the larger the cubic space the longer it will be before the air in it attains its permanent condition of impurity, and the more easily will the supply of fresh air be brought in without altering the temperature, and without causing injurious draughts. These conditions point to the care which should be exercised in the form of rooms, the position of windows, doors, and fireplaces. An open fireplace was preferable on every account to hot-air or hot-water pipes. Another group of questions relating to sanitary construction are:—What are the best materials for the house, and the best distribution of those materials? How can the less pure air from the ground be prevented from entering the house through the basement? What is the effect of the porosity of materials on the health of the inmates of a house? What is the law which regulates the loss of heat through walls and windows, skylights and roofs? For instance, if we assume that the loss of heat through a wall one brick thick, with a temperature inside the room 2° above that outside, would be 1 unit for a given area of surface of wall, the loss of heat through a wall built of two half bricks on each side of a central air-space would be two-thirds of the loss of the solid wall. Similarly the loss of heat through a double window would be about three-fifths of that through a single window. It is also of essential importance that the sanitary architect, builder, and engineer should have practical technical knowledge of the subject. He should understand what constitutes a good material and good workmanship. This practical knowledge is especially necessary in the details of the plumber's work, and the work connected with house drains. However well you may design your house drains the whole of your design may be rendered nugatory by apparently trifling mistakes or carelessness in the details. It is easy to conceal a bad joint; it is long before the defects in a badly-laid drain will become apparent if the drain is buried underground. Therefore, it is not only the officers of the army of sanitary constructors who require knowledge and education, but the foremen and the labourers. Turning to the question of water supplies, the necessity for storing it, according to some general scheme, was insisted upon. But there is in some localities in England an enormous surplus, and in other localities a bare supply, and the incidence of these supplies has no reference to the spread of population over the country; and he considered it the duty of the Government to take up this question. They already possessed much information on the sanitary condition of the country, but scattered over many departments, viz., 1st. The Ordnance Survey, which is under the First Commissioner of Works; 2nd. The Geological Survey, under the Privy Council; 3rd. The Registrar-General's Department, attached to the Local Government Board; and 4th. The Meteorological Office, under the Board of Trade. The first step is to bring these departments under one general head, so that the information they can severally afford may be properly correlated. The Local Government Board would seem to be the department under which they would most naturally fall; and a department should be added for registering the distribution of rainfall over the British Isles on the plan initiated by the enterprise of Mr. Symons. By means of this machinery the information bearing on the water supplies of the country, which is in existence, could be easily collected and made available, and the Government and Parliament would then be in a more favourable position for considering the necessity and, if such necessity exists, the means, of enabling the districts furnished with a copious water supply to assist the less favoured districts. My object in this *résumé* has, said Captain Galton in conclusion, been to show how extensive is the field of knowledge to be traversed by those who undertake the duty of building healthy houses, and of watching over the arrangements for securing the health of towns. The researches of the physiologist and the medical man into the laws which govern the prevalence of diseases have enabled them by the accumulation of information to lay down the principles upon which healthy construction should rest; it is the duty of the architect, the builder, the engineer, and the surveyor, to apply these principles; and their correct application is as essential to the efficient construction of a dwelling as is the quality or strength of materials which are used. I would lead you to the conclusions, therefore—1. That endeavours should be made to cause the adoption in educational establishments of courses of systematic education in sanitary science for those who undertake the business of sanitary construction. 2. That no person should be appointed to the office of surveyor of a Local Board or Corporation without a certificate from some duly qualified educational institution of proficiency in practical sanitary science.

Mr. Grantham, C.E., in proposing a vote of thanks to Captain Galton, suggested the appointment of inspectors, who should be empowered to examine the sites on which houses are about to be built, to ensure that made soil of decaying matter is not put directly next the foundations and under floors; the same official could certify that the house was in proper condition before habitation. Mr. W. Eassie, C.E., read a paper on "The Dangers of Bad Plumbing." Under the heads of imperfect jointing and improper treatment of wastes, he classified and dealt with the sources of the various evils. Imperfect jointing was, he said, mostly found in soil pipes, and the result has been the escape of sewage gas into the dwelling-house, either directly or by open windows. The perforation of sewer pipes was entirely due to the action of sewer-gas, and the obvious safeguard against this was free ventilation, above the level not only of windows, but of chimneys. A builder ought to refuse to lead a soil-pipe into a rain-water pipe which descends inside the house. As to waste deliverers, he pointed out the evils of the usual mode, and suggested causing the sink to deliver over the trapping water of an open gulley outside the house, no matter what distance the pipe may have to go. Scullery sinks, and still less cistern waste, should never be passed into soil system. It was bad enough to put a bath into the same room as a closet, but to allow the delivery of the bath waste to pass into the very foulest conduit was abominable, and a frequent cause of illness. He advocated the abolition from the closet of the filthy D trap, the iron container, and the trap at the foot of the soil-pipe; indeed all traps connected with closets ought to be done away with. No safeguard from house-drain gas, nor thorough ventilation of pipes, could be obtained until some method of absolute disconnection was practised, and fresh air taken in at a trap to be discharged from ventilating-pipe. A long discussion ensued, in which there took part, Dr. A. Carpenter, who said that in Croydon the local board of health had ventilators affixed to the town sewers, which at first were only dummies unpierced; Mr. J. Hanvey, town surveyor, Dover; Mr. Rogers Field, who urged the necessity of disconnection of house-drains, and took exception very strongly to practice of ventilating the sewer up the house, as advocated by Mr. Hanvey, in this agreeing with the reader of the paper; Mr. Armstrong, M.O.H., Prof. De Chaumont, Mr. G. J. Symons, Dr. Vacher, and others. The question was asked of Mr. Eassie, and remained unreplied to: How, if sewer gas was so poisonous as he appeared to think, by his elaborate provisions against its entrance into the house, he could account for the fact that men who worked in sewers looked ordinarily healthy, and lived as long as most people?

Mr. J. Bailey Denton read a paper on "Four Points in Sanitary Engineering bearing directly on Public Health." These were: (1) What sanitary objects should be comprised in duties of a river's conservancy board? (2) Should surface water be excluded from sewers? (3) Should public sewers, urban and rural, be perfectly ventilated? and (4) Should all sewers be made watertight? As to the first inquiry, the author contended that the duties of conservators should extend beyond the bed and banks of a river, and the maintenance of the navigation works to the protection from pollution of every stream and water-course within the watershed area, and to the substitution of either stored or subterranean supplies where the purity of running streams could not be assured. Taking up next the second question, he said the only advantage of admitting surface waters to sewers was the automatic flushing thus provided; but increased difficulties and expense of sewage disposal after dilution, and impossibility under the present law of discharging the total effluent into rivers rendered this, the only good feature of the combination of sewer and drain, nugatory, and the practice must therefore be condemned. On the third question, all sanitary workers were agreed on value of sewer ventilation; but practically, the problem was one of great difficulty. Tall ventilating shafts and openings into streets covered with charcoal trays had proved alike ineffective. The true remedies, he suggested, would be by increasing number of ventilators and by ventilating soil and sink pipes by sufficiently large tubes carried above roofs of houses. As to the last question, although the health of towns was frequently improved by drainage of subsoil through sewers, the permanent cost of treatment of effluent was greatly increased thereby, and there was an equal probability of escape of sewage into the subsoil as of the removal of water from it. Separate drains should, therefore, be provided for subsoil and surface waters. As a general conclusion the author suggested to the Congress the desirability that seven or nine selected men should, with Parliamentary approval, be appointed as a Sanitary Commission to consider these and other moot points of national importance raised by local authorities, and express their decision upon them whenever they were unanimous. In the discussion on the minor questions raised in the paper, Messrs. Waller, Roger Field, Professor de Chaumont, Armstrong, Coldwells and others joined, one or two speakers only taking up the main issue raised, and these protested against the proposed Sanitary Commission. Major-General H. Y. D. Scott read an able paper on "The Effects of long-continued Application of Sewage Water to the Same Land." He detailed experiments made by M. Ville at Vincennes as to the diminished yield of cereals occasioned by successively withdrawing one or more of the mineral constituents necessary to the development of this class of plant, and showed that a similar exhaustion of the plant not only followed the growing of the same crop without rotation on one area, but even when the conditions were alike and ordinary farm-yard manure was supplied. From this General Scott advanced to the position that there has been given us no encouragement for hope that land under sewage irrigation pure and simple has its losses from cultivation more efficiently restored than if manured from farm-yards. This theory had, he said, been confirmed by observation. Sewage-water, if treated with phosphoric acid and lime, would be increased in manurial value, by restoring the balance of mineral constituents needed by vegetable life to the soil, and the top dressing of treated sludge thus be rendered permanently beneficial. Lieut.-Col. E. Jones, V.C., of Wrexham, said that he should next year try General Scott's suggestion on his sewage-farm at Hafodwern. A controversy ensued in which several speakers insisted on the necessity, where irrigation is adopted, of excluding surface-water from sewage. A very lengthy paper by Captain Liernur, describing his double-conduit system of pneumatic conveyance for fæcal matter and town sewerage for slop and street-water, was partially read for the author, and discussed, the general opinion being against it.

In the evening Professor Corfield delivered an address to the Congress in the same hall on "Sanitary Fallacies." The history of his subject was, he showed, intricately bound up with that of the art of preserving health. He accordingly traced the healing and preventive arts, and the mistakes men have made in them, from the time of Æsculapius and the rising of the Alexandrian school, in opposition to the more enlightened empirics, to the present day, pointing out in passing the admirable code of sanitary laws promulgated by Moses. Hippocrates might be fairly regarded as one of the greatest of physicians and sanitarians, for he taught the treatment of diseases by the study of their causes—a mode of treatment which has been pursued for 2,300 years. In the Middle Ages the mistaken union of theology and medicine wrought incalculable mischief in Europe; it led the people to intercede with saints for protection against disease, instead of removing its cause, and to rely upon relics as protections against evil. Having referred to the ravages of plagues of many kinds through many lands, due to the crowded, dirty, and generally insanitary condition in which the people lived, he proceeded to point out that at the present day we were only beginning to awaken from our errors, and the great bulk of our nation needed education in the first principles of sanitary laws. Amongst the popular fallacies needing correction, he referred, at the conclusion of an able address, in detail, to communicable fevers, a "sufficiently wholesome" water supply, and the removal of refuse from the vicinity of habitations.

To-day Section III., "Meteorology and Geology," will be opened by an address by Mr. G. J. Symons, F.R.S., and papers are expected to be read by Messrs. Haviland, Lucas, Barns-Kinsey, Porter, Wallis, Corden, Bartlett and Stanley. In the evening a public dinner will close the Congress proceedings, and on Saturday an excursion to the District Schools at North Anerley will take place. We shall continue our report next week.

EARLY SCOTTISH ECCLESIASTICAL ARCHITECTURE.

THE first of the Rhind Lectures on Archæology was delivered on Friday week at Edinburgh, by Mr. Joseph Anderson, the matter being principally introductory. The second lecture on Friday last was a very interesting one.

Mr. Anderson, in the outset, said the object of the present lecture was to ascertain whether there existed in Scotland any ecclesiastical structures of date prior to the 12th century, and, if so, what were their characteristics. The earliest of the existing 12th-century churches presented certain features of form and construction which were of importance for the inquiry. Their form embraced a nave and chancel, and their typical features were round arches with radiating joints over doors and windows having perpendicular jambs. Having thus obtained a distinct point in time, and a known type in construction, he proceeded to deal with the unknown types on the principles of archæological classification. Supposing all the ecclesiastical structures known to be of the 12th century or later were swept away, there were left a considerable number of which the most that could be said was that they possessed no architectural features, in the common acceptation of the term. It was obvious that of this residue there must be some earlier than others. It was possible there might be some later than the 12th century, because the earlier type might have survived longer in some places. This produced an element of uncertainty in dealing with individual specimens; but in dealing with types or classes it had no disturbing influence, because, if the sequence of the types could be established, it was of no moment whether the specimens were early or late examples. In proceeding to consider the structures in question, he found they were susceptible of separation into two classes—churches with nave and chancel, and churches consisting of a single chamber. Of these two forms, the more complex was certainly the later, which was found passing from great rudeness of style and construction up to the decorative style and elegant construction of the Norman manner, and thus linking itself on to the current architecture of the 12th century. Even its greatest rudeness stopped short of the rudeness of a primitive style. There were chancel churches built of unhewn stone, but none built without mortar. On the other hand, the single-chambered type of church, which never rose to the dignity of the Norman types, could be traced back by a series of gradations into a type utterly primitive, and corresponding in all its characteristics with the type of the earliest churches in Ireland, from which our Christian institutions as ultimately established were derived. It was not to be implied that any church found to consist of a single chamber was on that account necessarily earlier than one constructed with a chancel; the conclusion related to the typical form alone, and did not necessarily apply to all the specimens of that form. The thing determined was merely that the single-chambered form went further back than the chancelled form. What was the precise date of any specimen of either was a question undeterminable by any scientific method. The chancelled churches on the mainland of Scotland were mostly Norman in style, and this removed them from among those with which he had to deal; but an exception might be made in the case of one which was unique in its features—the church of St. Regulus, St. Andrew's. This beautiful ruin had been assigned to many and various dates. Sir Gilbert Scott, one of the most competent authorities, found it difficult to conjecture its age, but imagined it to be anterior to the introduction of Norman architecture into England. But whatever might be its precise date, St. Regulus belonged to the most advanced type of chancelled churches, consisting of nave, chancel, and apse; and its typical form linked it on with the group of 12th-century churches. Outside the mainland, there occurred a very remarkable group of chancelled churches, in Orkney and Shetland. They were small in size, rude in construction, and possessed no architectural features sufficiently distinctive to determine their age. One of these in the Island of Egilsay, was, like the church of St. Regulus, unique in its features. It consisted of a nave and chancel architecturally distinguished, but differed from all other churches in Scotland in having a round tower joined to the west end of the nave. There was nothing in the material or character of the tower to suggest that it was not built at the same time as the church; and as it was this structure which gave the church its special character, it was necessary to inquire what was its special significance. There were only two other towers of this type in Scotland—one at Brechin, the other at Abernethy. Neither of these were now connected with any remains of a church, and they seem to have been always isolated buildings. The Brechin tower stood in the churchyard, and was built of large irregular blocks of reddish grey sandstone. The stones were cut to the circle of the tower, but not squared at the top or bottom, and therefore not laid in quite regular courses. The tower was perfectly circular throughout, and tapered regularly from the base to the summit, the interior diameter at the base being 7ft. 8in.. and the thickness of the wall 4ft. 2in. Internally the tower was divided by string-courses into seven sections or stories. While some of the windows had their sides inclined towards each other, others had the sides perpendicular. The structure thus showed the juncture of two distinguishing and dissimilar styles, one of which had come down to our own age, while the other stretched back to the very commencement of architectural construction. The doorway was at the height of 6ft. 8in. from the ground, faced the west, and was semicircular headed with inclining jambs, its arch being cut out of the solid. The tower at Abernetby stood in the churchyard, and was built of stones dressed to the curve and laid in courses. Up to the twelfth course above the ground-level the material was hard grey sandstone, which had resisted the weather; above this the tower was built of buff-coloured freestone, now considerably weather-worn, especially at the joints. There was only a very slight batter, so that the tower wanted the grace of proportion which distinguished that at Brechin. The doorway faced the north, was 2½ft. above the present level of the ground, and had inclined jambs and a semicircular head cut out of one stone externally. The tower was divided internally into six stories by string-courses. Some of the windows were semicircular headed, and all had inclined jambs. In the general features of their form and construction these two towers were strikingly similar; so that no one could hesitate to pronounce them both examples of one specific type. From the solidity of their construction and completeness of their preservation, it was reasonable to conclude that, if there had ever been many like them, traces would have been left in other localities. But there were no such remains, and there was no evidence of any kind to show that there ever were more of those towers on the mainland of Scotland. Yet, looking to their completeness of character and general correspondence of form, structure, and arrangement, it was impossible to regard them as freaks or accidental products of local circumstances. Thus the archæologist was led to the conclusion that they must be outlying specimens of a well-marked type which must have existed somewhere, if not in Scotland. Now, in Ireland seventy-six round towers of this type were known to exist, and there were notices of twenty-swo others not now in existence. These Irish towers showed the features characteristic of the two in Scotland; therefore those two were stragglers from a great typical group which had its habitat in Ireland; and all questions as to the origin, progress, and period of the type must be discussed with reference to the evidence derived from the principal group. From the inquiries of Dr. Petre and Miss Stokes, it appeared that the Irish towers admitted of classification into four styles—1. The style in which the tower was built of rough stones, untouched by hammer or chisel, with door square-headed, windows square or triangular-headed, and both constructed of the same material as the rest of the walls. 2. That in which the stones were roughly hammer-dressed, rounded to the curve of the wall, and laid in courses, but often irregularly; the door semicircular-headed, the arch being cut out of the lintel stone, and sometimes decorated with an architrave; the windows constructed of stones roughly squared, but of the same material as the rest. 3. That in which the stones were laid in horizontal courses, well-dressed and carefully worked to the round and batter of the tower; the doors semicircular-headed, the arch being formed of three stones and of finer material, and decorated with mouldings; the windows also of finer material than the rest of the walls. 4. That in which the building was of rough ashlar masonry, open jointed, and closely analogous to the Norman masonry of the first half of the 12th century. The whole group of those towers, therefore, belonged to the period of transition from the first lintelled style of ecclesiastical architecture to the round arch and decorated Irish Romanesque. It was established that this transition was accomplished between the commencement and the close of the 10th century; hence the first group of the towers fell to be included within that limit, and the whole period of this type of round tower structure would lie between the end of the 9th and the beginning of the 12th century. The adoption of this conclusion greatly reduced the antiquity claimed for these round towers on grounds hitherto deemed sufficient. The conclusions from internal evidence were strengthened when it was found that external evidence led to the same result. Miss Stokes had pointed out that in the majority of instances the towers were on or near the sites of churches which suffered from the ravages of the Norsemen or lay in the track of their plundering expeditions; and that the purpose of the tower, as demonstrated by its form, isolation, and arrangements, was to afford an asylum for the ecclesiastics, and a place of security for the bells, books, croziers, and shrines under their guardianship. Now the Norse invasions in question commenced at the close of the 9th century, so that on both lines of evidence the same limit of antiquity was reached for this typical form. The beginning of the 10th century was therefore the limit beyond which the antiquity of the Scotch towers could not be extended. The special features of the Brechin tower connected it with the third style of the Irish towers; so that in Ireland it would have been referred to a period later than the first half of the 10th century; and if the historical evidence did not materially support this conclusion, it supplied nothing that could be established against it. The Abernethy tower might be of two dates; but whether of one or two, the difference between it and the Brechin tower could not be very great, because in both its upper and lower portions it must fall in with either the third or fourth style of Irish towers. The lecturer gave reasons for not concurring with Dr. Petrie in assigning this tower to the 8th century, and went on to remark, in regard to round towers in general, that the type died out by degradation of form and function. The first step in this process was that the tower was placed so as to form part of the church structure, as in Egilsay; in the next stage the tower became a simple belfry perched on the end of the church. Passing on to speak of the transition from the single to the double chambered type of church structure, Mr. Anderson remarked that the church of Lybster, in Reay, so far as he knew the only specimen of its kind now existing on the mainland of Scotland, consisted of nave and chancel. It was roughly built of undressed flagstones of the district. The doorway in the west end was flat-headed, and like the doorways of the early Irish churches, the sides being inclined to each other. The chancel entrance was flat-headed, with inclined sides, differing neither in form, dimensions, nor character from the door. The chancel arch was the characteristic feature of all churches of this typical form: and no earlier type of chancel entrance was to be found than one which was not differentiated in any feature of size, construction, form, or ornament from the external doorway. In the roughly built and utterly rude structure at Lybster was seen the seen the simplest form of a chancel church; yet with all its rudeness it was as clearly a chancel church as one in the advanced style of the Norman period. The primitive rudeness and simplicity was only reached in churches of one chamber, with one door and one window. In Benbecula was found the only example of a transition stage in the conversion of a single-chambered church into a chancelled church by the addition of a chancel. In several other instances throughout the Western Islands, an old church and an older one were found contiguous to each other, and in all such cases the older was invariably the smaller. It was thus evident that among the single-chambered churches there were two varieties, one linking on with the chancelled church, and one which did not. The church with windows in the side walls, though single-chambered, was of the former variety, and was probably of the period of the chancelled church, because it was the addition of the chancel that created the necessity for lighting the nave separately. On the other hand, the type of church of small size, with one east window and a west door, was neither linked to the chancelled form, nor could be converted into it without losing its own distinctive features. Of this primitive type there were two varieties—those built with lime and those that reached the utterly simple character of construction which consisted of placing stone upon stone without binding material. One of the best examples of the first variety was found in the island of Inchcolm, of which the lecturer gave an interesting account. In the next lecture, it was added, the still simpler form would be traced back till it became associated with fortified inclosures and beehive-shaped cells, thus linking the Christian types of structure with other types which stretched back to purely Pagan times.

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AMERICAN ARCHITECTURAL THIEVES.

AN American architect has actually attempted to ask legal redress from a speculative builder who copied his designs. He had built himself a pair of houses which he desired "should be a specimen of his artistic skill, and should not be a mere copy of other houses." The fruit of his artistic skill was lucky or unlucky enough to attract the liking of a Mr. Orr, who is a builder, and Mr. Glendell, the complainant, was soon annoyed by persons who, in spite of his prohibition, persisted in entering his grounds and making measurements and drawings of the porch which he had put before his houses. Presently he found his porch duplicated on the front of a pair of houses which Mr. Orr was building a few blocks away. Mr. Orr, when remonstrated with, replied with unblushing confidence that he was in the constant habit of appropriating other persons' designs, and that he should finish his porch. Mr. Glendell has thereupon applied to court for an order to restrain Mr. Orr and the owner of the buildings from continuing the porch, and to compel them to remove it, on the ground that the design was obtained from him surreptitiously, illegally, and by trespass. We shall await with some curiosity the action of the court in this case, though we despair of the probability of any decision being given which either in America or this country may check those clever "conveyers" of other peoples' ideas, whose tricks we have more than once illustrated in these pages.

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CHIPS.

The rural sanitary authority of Midhurst union are about to sink a well and borehole at Todham Lock, near Midhurst.

Mr. Maconnochie, chief engineer at the Bute Docks, has been nominated as Mayor of Cardiff for the ensuing year.

At a meeting of the Lichfield Diocesan Church Extension Society, held at Lichfield on Thursday week, the following grants were made:—Bagnall, church enlargement, £25; West Bromwich, St. James's new church, £217; Tipton, St. Matthew's Tividale, £354, renewed; and Gresley, Linton Church, £207.

Sir George Elliott, M.P., has signified his intention to dedicate a piece of land on his estate, West Cliff, Whitby, to the public, and to erect thereon a monument to Captain Cook, the circumnavigator, who spent several years of his early life at the fishing village of Staithes, a few miles to the north of Whitby.

A stained window in memory of Bishop Wilberforce has lately been fixed in St. Paul's Church, Southampton.

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ILLUSTRATIONS.

OVER DARWEN TOWN HALL AND NEW PUBLIC MARKET.—BEDROOM FURNITURE MADE BY W. WATT.—PROPOSED CHURCH AT BRADFORD.—"SHEPHERDS' SPRING," HANTS.

OUR LITHOGRAPHIC ILLUSTRATIONS.

OVER DARWEN TOWN HALL AND MARKET HOUSE.

The Town-hall will occupy a prominent site fronting Church-street, and open on all sides. There will be a basement story entered on a level with the Market-square behind and 4ft. above ground in the front. It will contain the fire-engines and offices, the market and sanitary inspectors' offices, 6 police-cells, day-rooms and offices. In a mezzanine story there will be two sergeants' and a superintendent's house, with separate entrances, also stores, coals, and heating chamber. The ground floor has a main entrance in Church-street, another from the Market-square, one for the police-court, and a fourth for the public on the east side. Each of the civic departments are separate and distinct and convenient for business. A central area gives light and air to the hall corridors. The principal floor is reached by a grand staircase in the eastern side leading to the public hall, which has also a gallery separate entrance from the square and another on the north side for private use. The hall will hold 1,000 people, and will be a noble room with a flat-pitched panelled roof in wood and plaster. The Mayor's apartments, council-chamber, and committee-rooms are reached by a separate staircase, and are on the east and south fronts. The upper floor above these is arranged for a kitchen and hall-keeper's rooms. The whole of the building will be of local stone with Longridge stone dressings. The market is placed on the opposite side of the site, thus obtaining a market-square between it and the Town-hall. The central area is roofed by a double span semicircular girder roof, glazed on the north side only. Shops for butchers and general purposes are arranged on each side, the former opening into the market only. Vegetable and fish market spaces are provided at the west end, with low-pitched roofs to avoid interfering with the ancient lights adjoining. Above the shops are provided suites of offices reached by a staircase and projecting gallery on the market side. The general design is made to agree with that of the Town-hall. The estimated cost of the Town-hall is £35,000 and the market £15,000. The architect is Mr. Charles Bell, 4, Union-Court, Old Broad-street, London, E.C.

BED-ROOM FURNITURE.

Among our lithographic plates we give a page of working drawings of two very interesting designs for two equally useful pieces of furniture for the bedroom. They were designed by Mr. E. W. Godwin, F.S.A., and have been executed by Mr. Wm. Watt, of Grafton-street, W.C., in whose warehouse the articles may be seen. They are made of oak and are simply practical pieces of furniture, whose lines have been determined chiefly by the use for which they are intended. The scale to the several details is fully given, so that the drawings will be found to explain themselves.

VICTOR-ROAD CHURCH, MANNINGHAM, BRADFORD, YORKSHIRE.

The church is intended to be built in one of the rapidly-increasing suburbs of Bradford, and will accommodate 750 persons, at an estimated cost of £4,000, exclusive of the upper part of the tower. The walling and ashlar work will be of the local stone. The design is by Messrs. T. H. and F. Healey, of Bradford, and was selected in competition. Owing to the depressed state of the Bradford trade, it has been determined to postpone the erection of the church, and to build a large room upon the south part of the site, which will serve as a schoolroom or lecture-hall when the church is completed.

"SHEPHERDS' SPRING, HANTS."

The accompanying illustration shows the character of the exterior of a house designed by Messrs. Dodgshun and Unsworth, 2, Great Queen-Street, Westminster, for the picturesque neighbourhood of Bournemouth. The site is an eminence in the midst of pines. The materials specified are thin red bricks, with stone dressings for the lower part, and for the upper part timber and plaster; the internal work principally of oak. The original drawing was exhibited in this year's Academy.

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WATER SUPPLY IN COUNTRY DISTRICTS.

Last week, at the annual meeting of the Yorkshire Association of Medical Officers of Health, held at Bradford, Mr. Thos. Britton, M.D., read a paper on "A Difficulty in Water Supply." The subject, he said, was of immense importance, not merely to officers of health, but to the public generally. It did not directly affect the inhabitants of large towns, but, in a more or less degree, the population of rural sanitary districts and of the more thinly peopled portions of urban districts, and more especially in regard to hilly districts. It was the important question of the purity of water supply. He gave a typical case in which a supply of water, originally pure, became foul before reaching the consumer, and asked the members to imagine a stream flowing from a hill-top, and after being used in a farmyard for various purposes, where it became impure, then passed off through a drain in the land. The liquid finally reached a stone trough at a block of cottages, where it was used for domestic purposes. It then passed to another trough for a second block of cottages, and finally was discharged into a stream at the bottom of a hill. Supposing there was an outbreak of fever in the last block of cottages, produced by the contaminated water, what power, he asked, did rural and urban sanitary authorities possess by which they could remedy this serious state of matters? Would such a stream come under the term "water-course," as used in the Public Health Act, and if it did, could any sanitary authority adopt the section of the Act applying to it, to protect a private water supply? He thought it could not. The closing of the well or trough would not answer the purpose, as the inhabitants had no other supply. Should the magistrates order the water to be used for certain purposes only, they had no guarantee that it would be so used, but the contrary. Was it in their power to close the well, or to order the water to be piped so that it could not be fouled, or the sewage to be so piped as to prevent its fouling the water? On whom could the order be made, and would such order allow the authority obtaining it to go upon anybody's land to remedy the defect? He asked what was the meaning of "stream" in Section 3 of the Rivers Pollution Act. The farmer would claim the right to use the water for irrigation purposes—a right which had been exercised from time immemorial; and the owners lower down had only the right to the residue of the water after the farmer had done with it, and the latter was not bound to deliver it pure. The farmer would urge that irrigation was really the best means available of rendering harmless the sewage matter carried into the stream. That argument was, however, fallacious, inasmuch as it did not render the sewage harmless, because the water, running in a good stream, carried the sewage along the pipes which the farmer had cut in his land in an almost uninterrupted course into the stone trough below, only a small portion being really used for the land through which it passed. He thought very little relief could be obtained from the Rivers Pollution Act. In the Public Health (Water) Act, 1878, there was one important omission, which, in some cases, invalidated its provisions, no power being given to sanitary authorities to go into an owner's land to lay pipes to provide a pure water supply from another owner's house. Alluding to a case where the medical officer of health had reported that fever prevailed under the typical case given, by contaminated water supply, the Authority would send a notice to the owner farther down the hill to provide his house with a pure water supply, knowing that it could be supplied at a cost not exceeding a capital sum the interest on which, at 5 per cent., would not exceed 2d. per week for each house. The owner might reply that he was perfectly willing to comply, but the owner of the block of cottages higher up would not allow him to pipe any water from his stone trough, and, even if he did, the water had been previously contaminated by the farmer nearer to the top of the hill, who would not allow either of the owners of property below his to pipe through his land. What could the Sanitary Authority do? Would any of the three Acts enable the owner of the property lower down the hill to procure a pure water supply? He suggested as a remedy for the difficulty that the Local Authority might require the occupier or owner of the lands or premises through which the water supply ran to convey the water through such lands or premises in earthenware or metal pipes in a manner, for such distance, and within such time, as the Local Authority might fix. Should the occupier or owner fail to carry out the work, the Local Authority, after giving notice, ought to be empowered to direct its Surveyor to make the necessary alterations, the cost to be recoverable summarily as private improvement expenses.

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CHIPS.

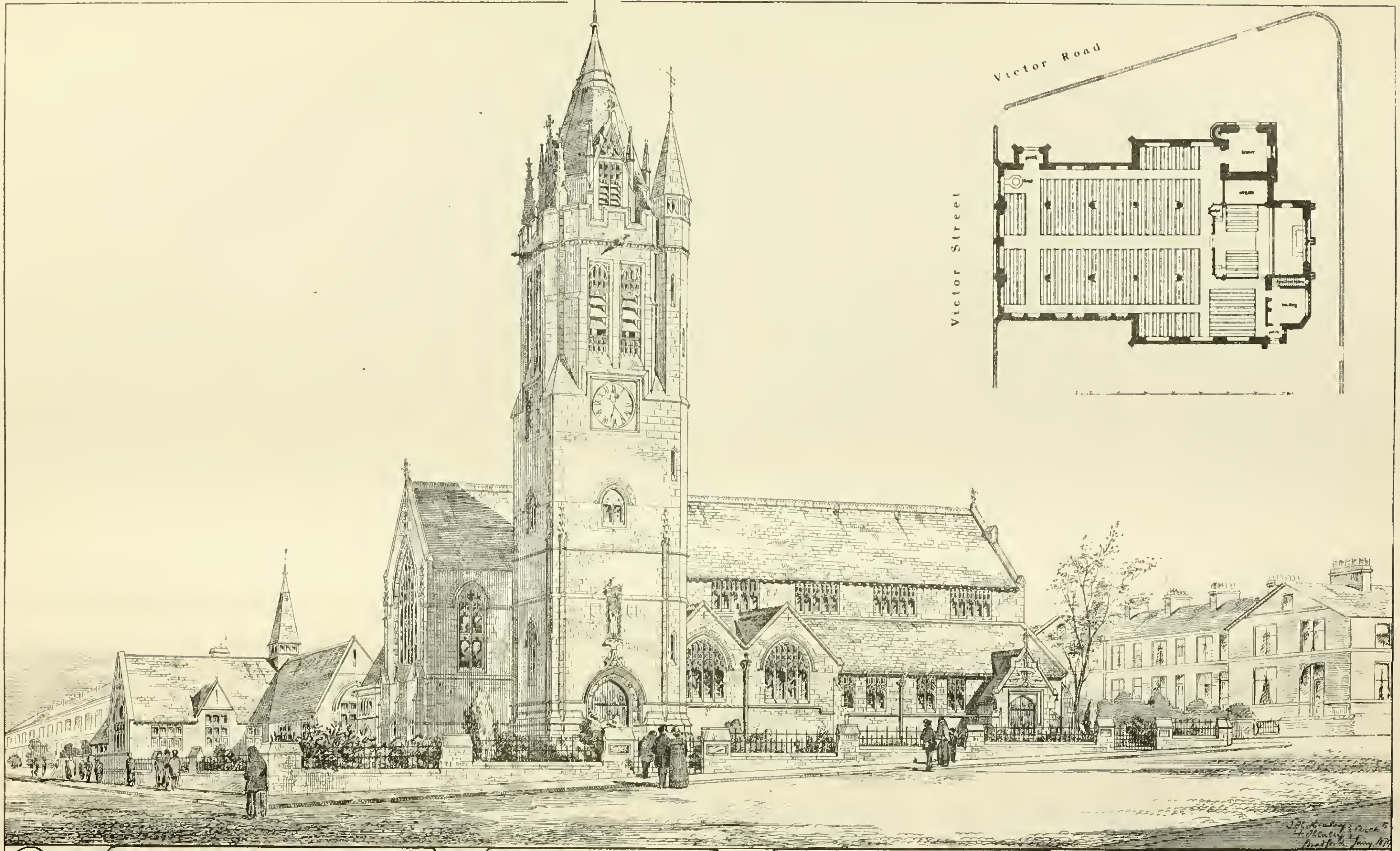
At the Essex Michaelmas Quarter Sessions on Tuesday week, it was reported that an amusement-room was in course of erection at the Brentwood Lunatic Asylum from the designs of the county surveyor; the estimated cost was £4,500. The boring on the site of the proposed new asylum at Wickham Bishops has hitherto been unsatisfactory; a depth of 804ft. has been attained, and the water in it is 194ft. from the surface, while the cost has been £5,302. Mr. Lowndes moved, and it was agreed, that the county surveyor take steps to put the proper arms of the county on the police-station at Grays Thurrock and elsewhere; three swords have been hitherto shown on the shield, whereas the records at Herald's College proved that they should be three seaxes.

The new Established church at Partick, N.B., was opened on Sunday. The church was designed by Mr. J. Boucher, architect, Glasgow, and is in the Gothic style.

Last Monday evening Professor Max Muller, the president of the Birmingham and Midland Institute, distributed the prizes to the successful students, and delivered the inaugural address of the present session. He dealt principally with the subject of education, and condemned the system of cramming and restraint imposed by the frequent examinations. While he was a believer in examinations as a means, he recognised that they might be so employed as to be productive of considerable harm in teaching students to look to the rewards of examinations rather than to follow learning for its own sake.

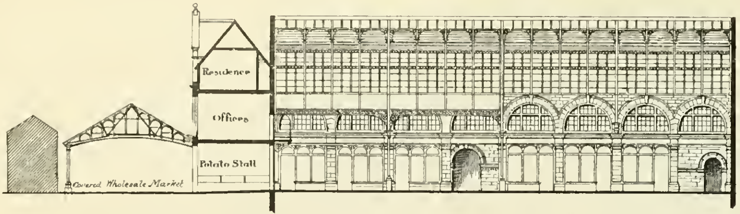
A new girls' school, erected by the Seaford School Board in Church-street, has just been completed. Mr. H. Card, of Lewes, was the architect, and Mr. C. Morling, of Seaford, the contractor.

The new church of Holy Trinity, Lawnbey, near Bexley, was opened a fortnight since. It is built of stone, and consists of nave, south aisle, and chancel, and provides at present 350 sittings. A north aisle and tower are to be added hereafter. The pulpit is of carved oak, and the lectern of brass. The organ was built by Messrs. Bevington and Sons.

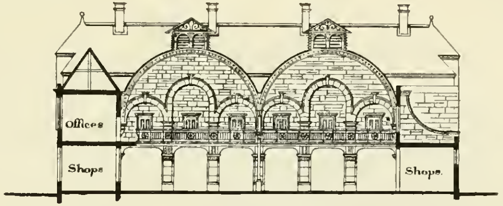


Proposed·Church·Victor·road·Manningham·Bradford:

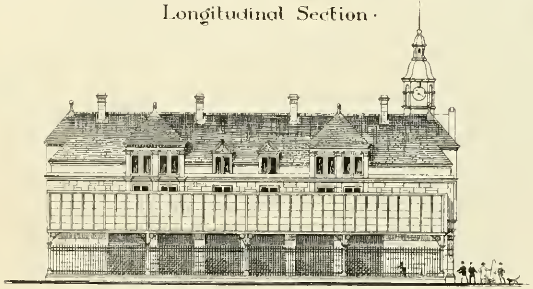
Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C



Longitudinal Section.



Cross Section

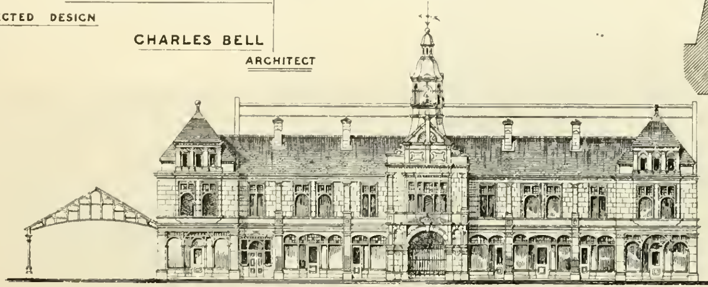


West . Elevation

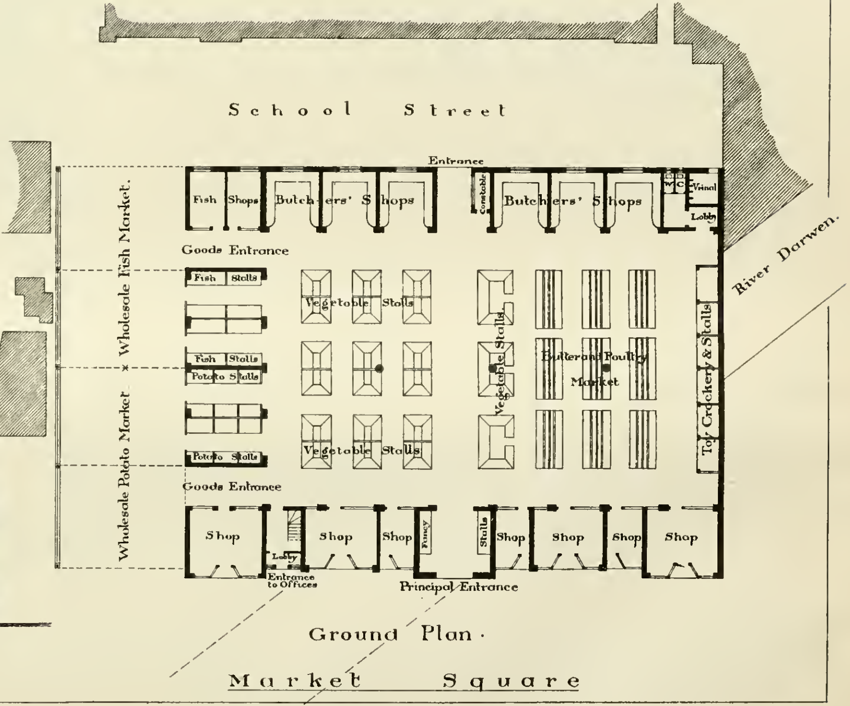
NEW · PUBLIC · MARKET ·
OVER DARWEN

SELECTED DESIGN

CHARLES BELL
ARCHITECT



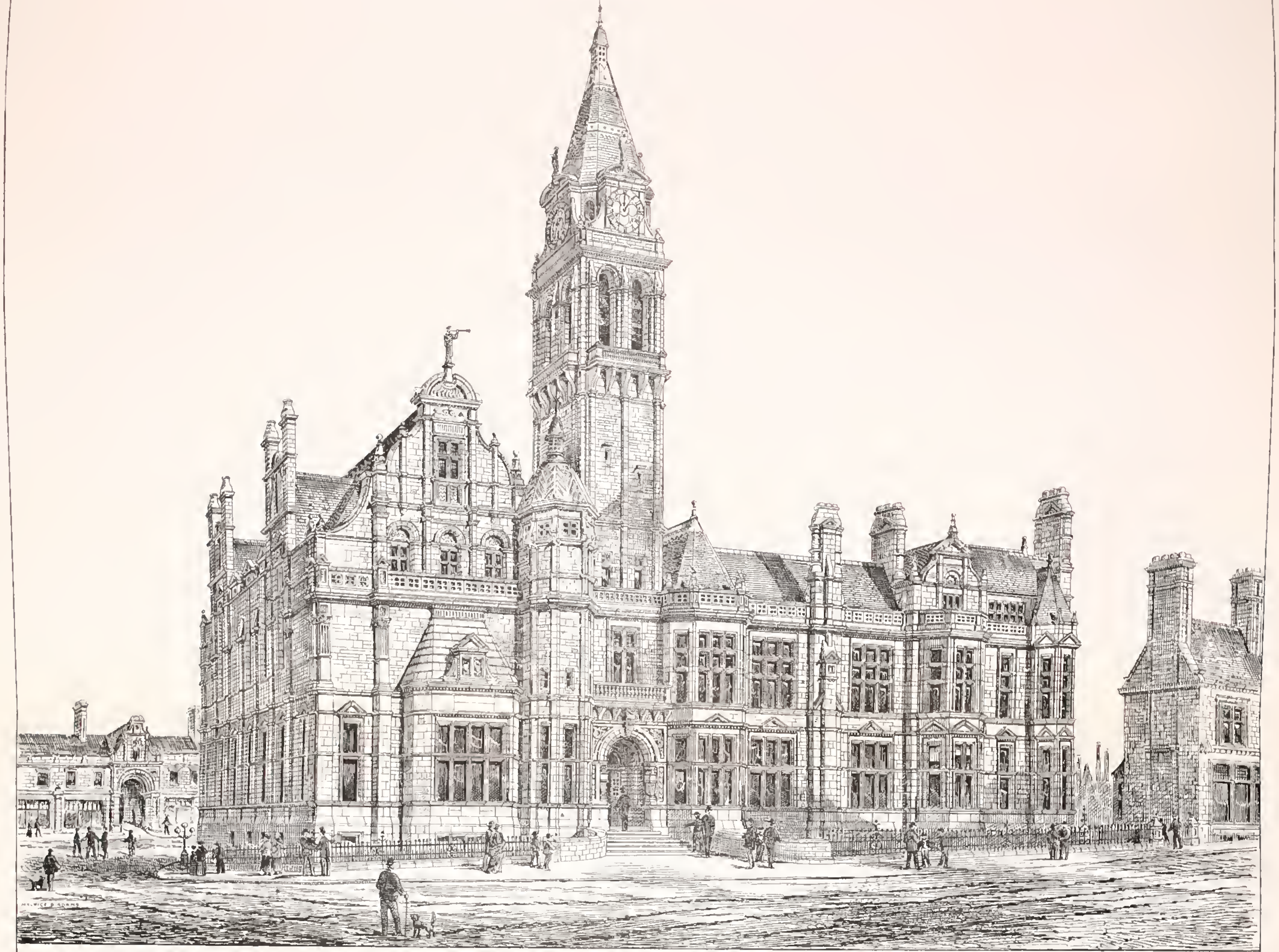
Elevation · Market Square.



Ground Plan.

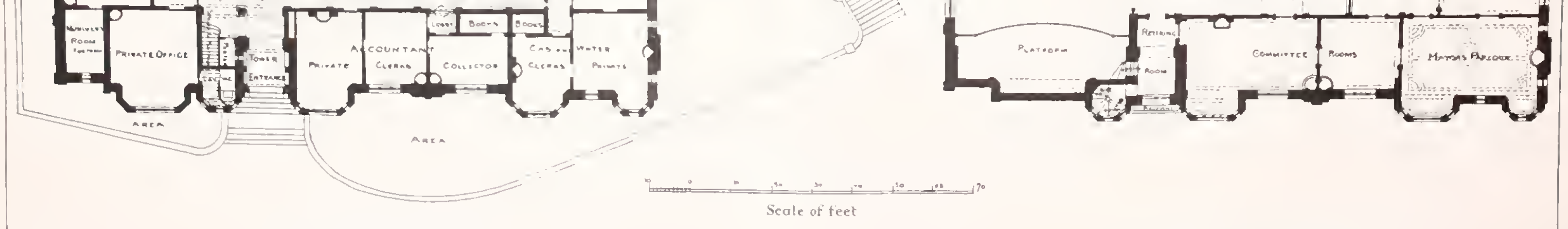
MAURICE B. ADAMS DEL^T

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



OVER DARWEN TOWN HALL COMPETITION THE SELECTED DESIGN "1879".

CHARLES BELL, ARCHITECT.



Ground Plan.

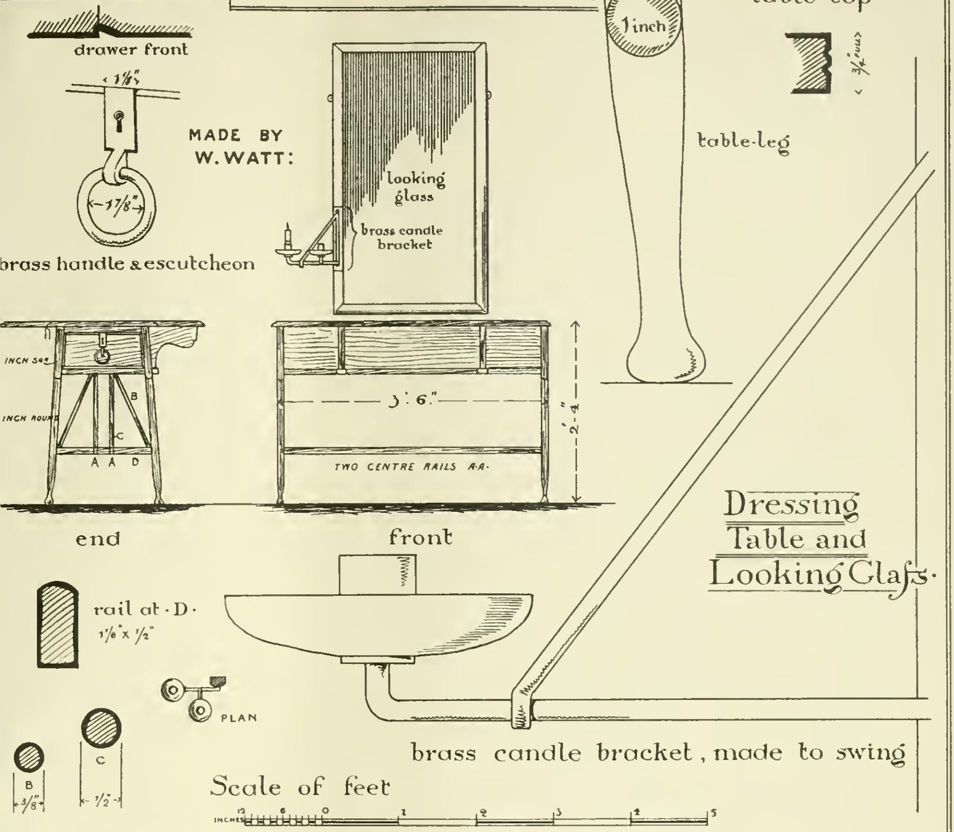
First Floor Plan.

Photo Lithographed & Printed by James Akerman, 6, Queen Square W.C.

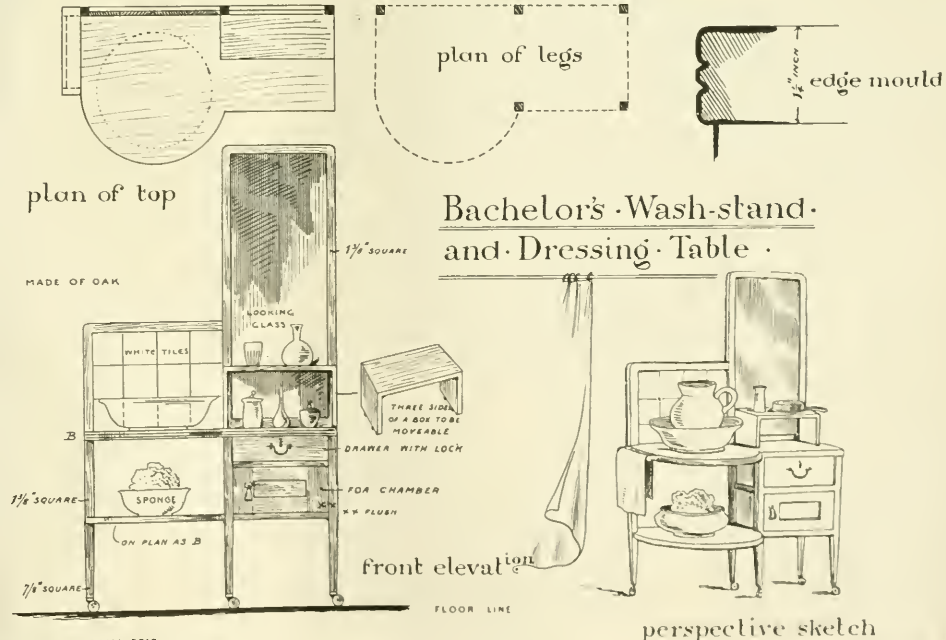
BED ROOM FVRNITVRE DESIGNED BY E.W.GODWIN F.S.A.

MADE BY W. WATT:

Dressing Table and Looking Glaſs·



Bachelor's Wash-stand and Dressing Table



MAURICE B ADAMS DEL

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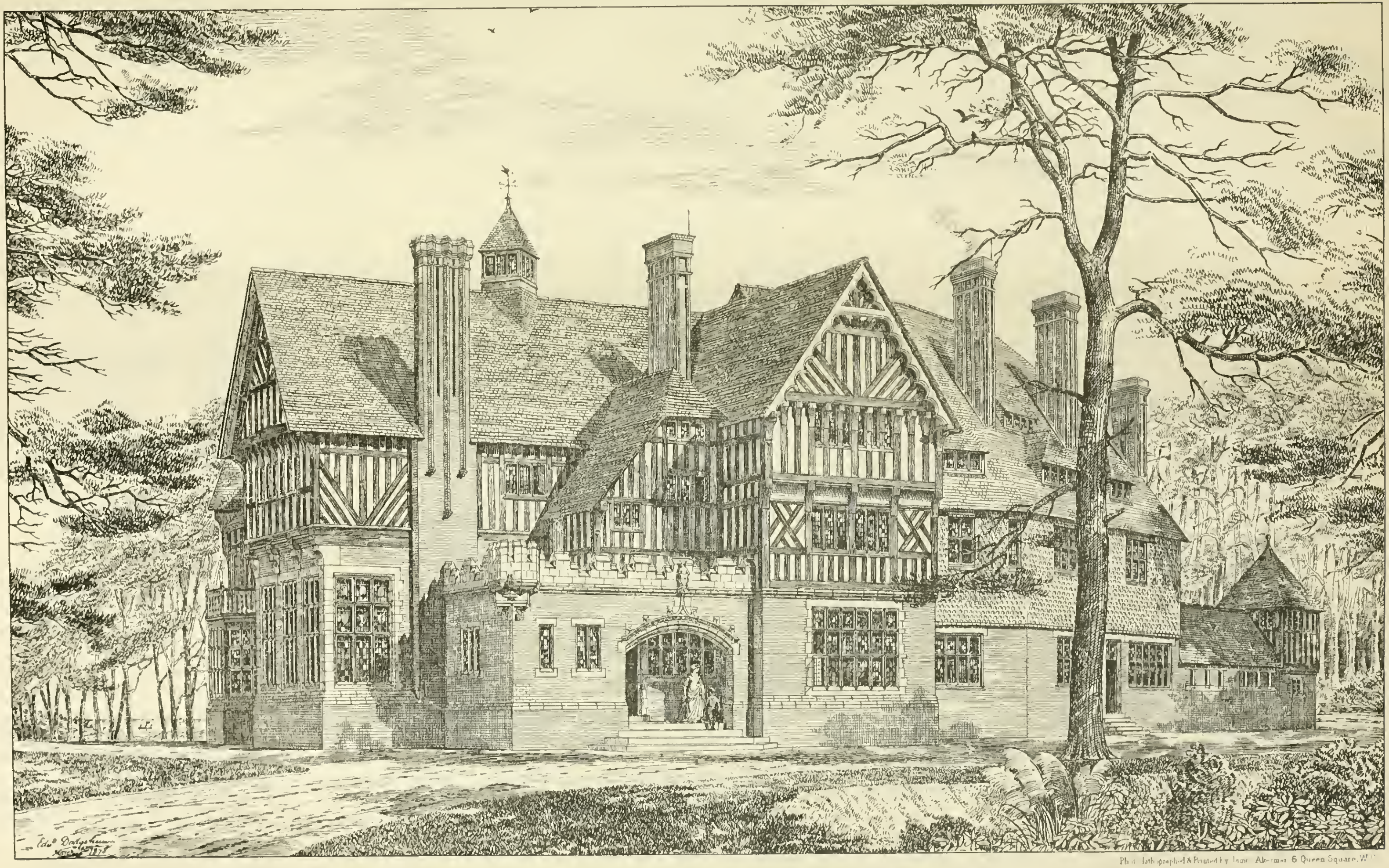


Photo-lithographed & Printed by James Akerman 6 Queen Square, W.C.

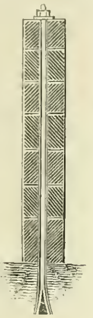
SHEPHERDS SPRING HANTS.

DODGSHUN & UNSWORTH, ARCHITECTS.

STABILITY OF STONE STRUCTURES.

A PAPER of considerable interest to the architect and bridge-engineer appears in the *Transactions* of the American Society of Civil Engineers, in which the author, Mr. William H. Searles, C. E., starts an ingenious theory of pier-construction. Mr. Searles first dwells upon the conditions of stability of stone structures generally, and justly remarks that their resistance to overturning depends entirely upon their weight, or upon the force of gravity. The columns of the Grecian portico which carry only the static weight of the entablature varies, as the author says, from six to ten or eleven diameters, the Egyptian Obelisks, in the height of their shafts, from nine to eleven diameters. These structures are not intended to withstand any other force than that of the wind; but to structures required to resist forces like earth and sand, very different proportions have to be given; thus, a retaining wall of masonry against dry sand must not have a height greater than three times its thickness to secure stability, or only twice its thickness if it have a surcharge equal to half its height. Again, lighthouses exposed to the force of the waves are generally less than three diameters high, as in the Eddystone, where the height is 2·61 diameters; the Bell-rock, which is 2·75, the highest mentioned being the new Eddystone lighthouse now being erected, which will be 3·25 diameters in height. Mr. Searles does not think that the dowelling and dovetailing of the beds of stone add much to the strength of the structure, and this opinion, when we consider the nature of the resistance afforded by such means, is quite just. They are chiefly useful in affording resistance in the early stages of building, before the superstructure is carried to a sufficient height to prevent the sea from breaking over it, and, as the author very truly remarks, the stability obtained by such means, or that of cement, is due to the tensile strength of the material, a kind of strength in which stone is deficient. It is a principle acted upon in designing stone structures not to trust to the tensile resistance of that material, and the adhesion of cement is only regarded as an additional, though uncertain, element that is never calculated upon. Bearing these facts in mind, the author proceeds to show that from the transverse strains or side thrusts caused by moving loads, or due to external impulses, and the force of wind and waves, to which forces the bridge pier is subjected, they must be considered as something more than pillars supporting a static load, and, as such, ought to be proportioned. The piers of bridges vary considerably, but they are generally, if of masonry, proportioned to these side strains; hence their great bulk or diameter when compared with their height, and the consequent cost of building and obtaining foundations for them. Various substitutes for stone piers have, consequently, been introduced, as the pneumatic cylinder filled with concrete, hollow iron piles, as that of Cushing's, and various iron pillars. The great objection to iron pillars is the non-durability of them, the effects of corrosion; hence the value of stone piers.

Mr. Searle's object is to show how the size and cost of masonry piers may be reduced without a sacrifice to their stability. The reduction of the pier cannot, from what has been said, be attained by improving the quality of the cement, nor can it be obtained by the use of dowells between the stone courses, nor by any system of dovetailing the blocks, and, in general, little dependence can be placed upon any method which supposes a tensile or transverse strain in the stone. We must look, therefore, for something which will be independent of these sources of strength. Mr. Searle suggests that "if by any means the normal pressure on the beds can be increased, the stability of the structure will be augmented," or, in other words, we might supplement the force of gravity by a tension rod of steel vertically placed in the masonry and stretched nearly to its elastic limit, thereby enabling us to reduce the amount of masonry in the size of the pier without a loss of stability. The idea is at least novel. The weight of a stone pier has always been its main stability. Can we reduce it in diameter by adding to its pressure upon the foundation? The author says, "let the rod be anchored in the foundation, passed up through the core of the masonry, and put into a state of tension by a nut at the top. Its tensile force is now exerted upon a washer, which, in turn, presses upon the masonry with an equal force, and the pressure is transmitted through every joint to the foundation." The rod, in short, acts like an additional weight passing through the centre of gravity of the pier, and acting as much on the top stone as all the other stones. Having this pressure, it is maintained with reason that we can diminish the proportion of the structure to that of a column, having only stone enough to resist compression or the simple static load of the structure, and a sufficient base to afford a lever arm. The author proceeds to enumerate certain advantages of this system—namely, saving of cost, the consequent ability of being able to use the best quality of stone and cement, the use of single stones for each course in many cases, thus dispensing with vertical joints, the small space occupied of a water way. Columns reinforced by steel in this way the author says may be safely carried to a height of 12 or 15 diameters, above which they fail by the law of flexure only. The author has carried the plan into execution in the erection of an iron truss bridge, of 2 spans of 97ft. each, across the Presumpscot river at Cumberland Mills, Maine. The river is subject to sudden and violent freshets, and the central piers consist of two square columns placed diagonally with the stream, one under each truss. Each column is 2ft. square, 14ft. high, and entirely independent of each other. The rods were of Bessemer steel 3in. diameter, with a spreading at the bottom, so as to form a dovetail in the rock (see sketch). We quote the author's description:—"Each foundation was prepared by cutting a place 2ft. square in the rock and dressing it to a fine and level bed; at the centre of the square a hole 4in. diameter and 30in. deep was sunk with a Wood's steam drill. The hole was enlarged at the bottom to about 6in. on one diameter, giving an oval section." The hole was calipered at every inch and shaped by hand-drills, and a wrought-iron wedge 14in. long was forged of such size and shape that it would spread the rod so as exactly to fill the hole. "About a quart of thin paste of clear Portland cement was poured into the hole in the rock, and the rod immediately lowered into it with the point of the wedge sticking in the jaws. The rod was then driven home over the wedge with a 450lb. hammer having a 5ft. fall. The upper end of the rod on which a screw-thread had been cut was held in its position by a notch in a plank attached to the scaffolding." Granite blocks were used from the Yarmouth quarries; they were 18 to 28in. in thickness and finely dressed on two beds so as to make a joint about $\frac{1}{8}$th of an inch. Each block was perforated by a 4in. hole for the rod, and the annular space between the rod and stone was filled with dry cement powder, the object being to protect the steel from rust. The washer of cast iron was placed on the top stone and a steel nut was screwed down so as to stretch the rod 12-100ths of an inch. Assuming the coefficient of elasticity to be 28,000,000, the strain in the rod is



$$\frac{0{\cdot}12 \times 28{,}000{,}000}{12 \times 14} = 20{,}000\text{lb. per square inch.}$$

In estimating the stability of such a column, we have the weight of the stone and the load on the column added to the tension pressure of the rod forming a vertical force, which we have to multiply into the lever arm of base, this worked out by the author gives a moment of stability in the case described of 143,570ft.-lbs. We cannot afford space to discuss in detail the mathematical part of Mr. Searle's paper, but from a general review of the proposition we have no hesitation in admitting that the principle may be, in some cases, usefully employed to increase the stability of stone piers. The iron tie, which it really is, may be looked at as a large dowel or plug binding or stringing together the courses of stone, and the only doubt we entertain is whether the initial pressure could be maintained, seeing the difficulties in the way of making a good anchorage, to say nothing of vibration and other disturbing effects on the structure. Even the variation of temperature might considerably reduce the tensile stress on the rod. The resistance of the rock or bed itself would have, in the first place, to be tested to bear such a strain as 141,300lb., and the elongation of the rod must be nicely calculated to the smallest fraction before the tension can be relied upon. The difficulties in the way of a delicate adjustment of the required force to which the rod would have to be screwed, seem almost too great to allow us with confidence to assert whether piers so treated are really under the necessary pressure, though experiments carefully conducted would reduce these doubts to a minimum. In the mean time, the principle suggested by Mr. Searle may be admitted to be an ingenious one, and well worth the further investigation of the profession.

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MR. RUSKIN'S MUSEUM AT WALKLEY.

PRINCE LEOPOLD on Wednesday morning visited the St. George's Museum, Walkley, founded by Mr. John Ruskin, the eminent art critic. The *Sheffield Telegraph* says:—"The museum has no outward pretensions; it is a plain, substantial dwelling, standing in neatly-laid grounds, and having from the front extensive views of moorland and woodland scenery. It is intended hereafter to build extensions, in which will be accommodation for a picture-gallery, library, and reading-room. There is an original print of Erasmus, by Albert Dürer, the study of which seems inexhaustible. The massive clasps of the mammoth tomes at his side, the arrangement and execution of his ample robes, full and flowing, void of stiffness and formality, and the facial expression of the divine are inimitable. The celebrated 'Melencolia' bears it good companionship. Here are some gems of art by the founder; some colour drawings of feathers and simulated blades of grass that are perfect. There are two beautifully-illuminated black-letter Bibles, quite unique and very rare. One bears the date of 1260, is inlaid with tiny plates of gold, and drawn in lines as fine as threads of gossamer, 'lashes of film,' the lettering intensely black, and in a capital state of preservation. A missing leaf has been supplied of two centuries later date, but what a falling off is there! The Arab steed and the country cob are in the same stable together, the sleek greyhound and the sturdy mastiff are linked in one leash, in comparison. Similar remarks apply to a copy of Chaucer dedicated to Henry VIII. An original copy of Holbein's 'Dance of Death' is also on view. There is likewise a carefully-prepared work on entomology, which took the artist twenty-five years of a laborious life to obtain the specimens, draw them with mathematical accuracy, and colour them with tints that might have been taken from the rainbow; and not less wonderful are the shadows cast by these tiny insects. So finely does the shadow merge into the shade that none may point out the line of demarcation where the one ends and the other begins. They look alive and seem to be moving, some in the attitude about to 'sprint.' Specimens dead and mounted do not realise this idea. Another kindred book on shells and fishes, drawn from life—say, rather, transferred alive. Then the Leonardo da Vinci's 'Madonna and Child' are enough to make any one guilty of Mariolatry, notwithstanding the deterioration the picture has suffered in a remount. The Madonna is beautiful in tone, exquisite in expression, and the Child is looking with almost living simplicity into its mother's face. There is a striking bust of Mr. Ruskin, executed by a Sheffield grinder, who grinds no longer from the horsings, but pursues his genius under artistic auspices. An oil colour by William Small of a shipwreck—his sketch for the great oil painting—hangs upon one of the walls. It is a gem of itself. Three works of Carpaccio, representing incidents in the life of St. Ursula, rivet the attention. Small they are, but priceless, and a full account of them has already occupied the pages of 'Fors Clavigera.' The 'Madonna and Child,' by Philippo Lippi, is again one of those engaging masterpieces which Mr. Ruskin has obtained not only for its intrinsic beauty but that others may see it, learn to admire, and then seek after self-culture. This collection is regarded at present as a nucleus only; should it ever become extensive in its present projection, it would then become the artists' Mecca. A national purse instead of a private fortune might be necessary to make it all the artist-founder comprehends in his laudable scheme."

Proceeding on Wednesday to show to Prince Leopold the contents of the museum, Mr. Ruskin first drew attention to the large picture of the

"Madonna and Child," painted by Verrocchio, Master of Leonardo da Vinci, "given to me in Venice by a gracious fortune to show to the people of Sheffield," to whom, he explained, it was specially appropriate, since, besides being an unrivalled painter, Verrocchio was also a great worker in iron. Mr. Ruskin dwelt with enthusiasm on the teachings and technical merits of this picture, on its lessons of the reverence that is due to woman. That picture he said was an answer to the inquiry often addressed to him, "What do you want to teach us about art?" It was perfect in all ways, in drawing, in colouring; on every part the artist had worked with the utmost toil man could give. He drew especial attention to the beauty and detail of the Virgin's girdle of embossed gold. Mr. Ruskin drew Prince Leopold's attention to his unique collection of minerals and precious stones, to the specimens of gold and virgin silver, amethyst, onyx stone, and many other unrivalled examples of the wonders of mineralogy. "I want," said he, "to get everything beautiful," and in answer to a question he added, "I am proud to say that, unlike other collectors, I never spare cutting my specimens, always looking to that which will best show texture. My main aim is to get things to show their beauty." Turning next to the cabinets in which are stored his etchings and photographs, Mr. Ruskin pointed to them as illustrating the way in which he proposed to get his museum ordered, a work in which he had been engaged for a week past. He showed a photograph from that earliest church in Venice on which is inscribed his favourite legend enjoining on the merchants to be just and to have their weights true. "That," said Mr. Ruskin, "was the beginning of the whole commercial prosperity of Venice. From that came the pure gold of the Venetian Zecchi." Mr. Firth would, he thought, be interested to know that when he was daguerreotyping in Venice, and wanted absolutely pure gold for his plates, he could get nothing so pure as that old Venetian coin, and all the city's prosperity was the outcome of that honest thoroughness. A series of photographs from Venice, showing the various forms of the Greek acanthus, was exhibited, Mr. Ruskin drawing especial attention to the variety introduced by the play of the workman's hand, no one leaf being like another. In drawings of his own, which he produced, Mr. Ruskin said his object had been to show how our English leaves were adapted to the same treatment—the oak leaf for instance. He hoped to show a series of rude carvings by Sheffield boys and girls from natural leaves. He was going to have a series carved in wood, and the cabbage or kale would be the first, for that was the vegetable which, in the North, was the origin of our most beautiful sculptures. Mr. Ruskin showed a cast of one of the vine leaves from the Ducal palace, displaying admirably a fidelity that nothing could rival, the patient skill of the workmen of the fourteenth century, and an edge than which nothing could be finer or clearer. Then the learned professor drew attention to a rough block of sandstone, a specimen showing the pure cleavage of the sands of England, "which, thanks again to *Fors*, I was able to take from Brentwood."

With reference to his projects in regard to the Museum, Mr. Ruskin said he did not want to build another room until he got that room into perfect condition. Then when that room was made the vestibule, and in this way showing the source of all beauty, as he got power, having been quietly acquiring the necessary land, he hoped to make reading-rooms for the workmen which they could use in connection with this room. Drawing His Royal Highness's attention to the beautiful view from the window, now lighted up by the gleams of sunlight, Mr. Ruskin continued, "I hope always to have pretty things for them to see, and light to read, and fitting everything close as I do so; and I hope it may be filled by workmen who will join to scientific teaching this study of art and nature, and that it will be felt by the town worth making an effort to fill the rooms with books."

MR. CHAMBERLAIN ON RUSKIN'S "SEVEN LAMPS OF ARCHITECTURE."

On Wednesday evening Mr. J. H. Chamberlain delivered the third and concluding lecture on Dr. Ruskin's "Seven Lamps of Architecture," before the Birmingham Society of Artists. Mr. Chamberlain commenced his lecture by referring to Dr. Ruskin's lamp of Beauty. He remarked that this was a subject about which there was a great deal of difference of opinion, and it was a subject respecting which ideas constantly changed. If all the ornaments they had once regarded in the light of being beautiful were now placed in a museum it would be seen what strange things had been received into the world, and what strange attempts people and nations had made to ornament themselves and their holdings. If they would look at their own houses, or rather the houses of their friends, for that was always more pleasant, they would see they were comparatively filled with things supposed to be ornaments, but which were really very horrible things, and according to Ruskin, ought to be set down as monstrosities. Dr. Ruskin said "good ornament is the expression of man's delight in God's work." If they liked they would omit the name of the Deity, and say "Nature's work," which meant essentially the same thing. If with respect to ornament they could not go to Nature and say "the idea of this ornament is derived from Nature," or if, on the contrary, they could say "it is in direct opposition to the teaching of Nature," then they might be sure it was not ornament, it was not to be considered as ornament, and was most probably a monstrosity. Dr. Ruskin's idea of ornament was that it should take the character of some form which could be found in Nature, and the more frequently the form in Nature could be seen the better the character of the ornament. He (Dr. Ruskin) did not begin by saying "such and such things are beautiful," but he criticised those designs which were not beautiful. These designs Mr. Chamberlain stated were the Greek fret, the moulding known as the egg and dart, the portcullis, the Tudor rose, the scroll and drapery; and he explained in some detail the reason Dr. Ruskin objected to them. The foundation of art he described as simply being admiration, and if they could not admire they could not have art. He believed art was nothing at all but that admiration which quickened into joy and deepened into love. They must have all those things, though they might reverse their order, and begin with love and come to joy and get to admiration. After all, the only test as to what was really art was time, and the only way they could learn what was pure ornament was by studying the types which by the general consent of the world were allowed to be the fairest examples of ornament. Speaking of ornamentation, Mr. Chamberlain said there was a great deal that was noble in abstract ornamentation, and a great deal that was foolish in conventional ornamentation. If a person designed some ornamentation for them which was foolish or particularly base, and they inquired what sort of an ornament it was, they would most probably be told, "Oh, this is a conventional ornament." Now, what the person meant by that was, that he had not the knowledge to draw a single form properly, and he drew a form improperly and said it was conventional. He supposed the person really thought that his dull idea of something he did not understand was better than a more perfect rendering of something that nature had done properly. On the other hand, there was in this abstract ornamentation probably the very highest work to which mortal man could attain. Artists and architects could make likenesses of anything if they would only give themselves time enough and have patience, but it required a severe training and very great power before they could produce a close likeness of anything. After a brief reference to the lamp of Power, the lecturer spoke of the lamp of Memory as being one of the most delightful lamps in the book, and remarking that he agreed with all it contained. Their work, if it was reliable and good, must have a smack of eternity about it. They knew their work would perish, they knew in a very few years very little of it would remain; and yet, if they were to make good work, they must cheat themselves, and hope against hope that the work would long live after they had gone to their rest. Dr. Ruskin, in speaking of public buildings, said there ought to be no ornamentation of these buildings that had not some intellectual intention. If the ornamention of a public building did not tell something of the history of the town, of the people, of human nature—the greatest history of all—it had no intellectual intention, and had no business there. Mr. Chamberlain condemned the way in which the restoration of public buildings had been carried on in England; and spoke in conclusion of the lamp of Obedience, remarking that with this lamp there must be associated fellowship, and it was only by wise and noble brotherhood that art was made noble, lasting, or great.

NEW COLLEGE CHAPEL, OXFORD.

The Chapel of New College, Oxford, which was reopened on Tuesday, the 14th inst., after being closed for eighteen months, is described as follows by a correspondent of the *Guardian*. Shams have given place to realities. Plaster has been superseded by stone in the reredos, and by noble oak timbers in the roof. What remained of the old oak woodwork in the stalls has been cleared of its disfiguring lead of paint, and the deal or plaster makeshifts, with which it had from time to time been repaired, have been replaced by new oak, so skilfully fitted in with the old as not to affect in the least the harmonious effect of the whole. The rich carving of the founder's time has been carefully cleaned and repaired, and the complete set of "miserere" seats, one of the finest in England, arranged in their places. A splendid new oak screen and organ-case, of beautiful design and workmanship, has been erected in place of the old screen; and the "dummy" pipes, coloured to represent brass, which adorned the front of the organ as before arranged, are now exchanged for speaking-pipes of polished tin, the glitter of whose surface makes an effective contrast with the surrounding woodwork. But few additions, however, were necessary in the organ itself, which was thoroughly rebuilt by Messrs. Willis, of London, only two years before this work of restoration was entered upon. Overhead, from end to end of the chapel, stretches the glory of the whole—the magnificent new roof, of the "hammer-beam" pattern, familiar to us in Westminster Hall and in some of the fine parish churches of Norfolk. The "principals" of the roof start from the old corbels, on which, now that their coating of plaster has been stripped off, may be seen the remains of colour: and from each hammer-beam looks down upon the worshippers below the figure of an angel with outspread wings. The first impression made upon the eye by the new roof is its vast height; and a glance at the east end shows that it rises some ten or twelve feet higher than its predecessor—and, in all probability, than Wykeham's original roof, whatever that was. For above the restored reredos, which carefully follows the traces of the original stone reredos destroyed at the Reformation, appears a blank space, at present undecorated by fresco or other ornament, which, it must be confessed, is somewhat of a blot upon the perfection of the whole. And the increased height is still more apparent externally, by the leading of the roof seen above the parapet, and breaking the line of pinnacles which is so characteristic a feature of Wykeham's work. It is obvious, in fact, that the new roof is something different from what was originally placed on the building, and that it is not in the strictest sense of the term a restoration. It is likely, therefore, to meet with some adverse criticism by those who think that no gain of internal beauty and effect can compensate for a departure from architectural precedent. Sir Gilbert Scott, however, thought otherwise when he designed this roof; and no architect of our time has been less open to the charge of irreverence for antiquity. He thought, we may presume, that in the absence of any positive evidence as to the exact nature of the founder's roof, it was allowable to adopt that which would add the greatest beauty to the founder's work; and that it was acting in the spirit of so enlightened a mind as that of William of Wykeham to substitute for the probable original something which might fairly be regarded as an improvement upon it. And we imagine that the majority of those who see the chapel in its restored beauty, will agree with Sir Gilbert Scott; and that the founder himself, could he rise from his grave, and see what loving hands have done to beautify his work, would accept the change, as surely as he would accept the other changes that have come over his two noble foundations of New College and Winchester, adapting them to the requirements of altered times, and making them indeed "bring forth more fruit in their age." The reredos, so prominent a feature in any church, and, above all, in buildings which, like the chapels of New College, All Souls', and Magdalen, have no east window, has been, as we have said, completely restored in stone, so far as the niches and pedestals for figures are concerned. Enough of the original stonework remained under the plaster imitation to show the lines of the original design; and the niches only now want their figures to make this reredos as fine as that of All Souls'—perhaps even finer, as the figures will be less crowded together, and more in proportion to the rest of the work. The credence-table with its canopy, and three sedilia, have been restored; fragments of the original canopies, which were found imbedded in the wall, having been incorporated with the new work. A narrow recess, with a glass door, has been cut on the north side near the credence-table, to receive William of Wykeham's crozier, which the college preserves as a precious relic of its founder, and which is of itself a singularly valuable specimen of early enamelled work. On the north side immediately ast of the stalls proper, there has been opened door, previously blocked up, into the old estry, a large, well-proportioned room, with a fine oak roof, which for many years past has been a lumber-room. This vestry has been renovated and repaved with tiles, and will henceforth be used for its original purpose.

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WATER FOR NOTHING.*

MR. HIBBERD directs attention in this brief essay to a source of supply which he sems to think has been neglected by all parties alike, by the companies, as a matter of course, and by the scientists and philanthropists, as if by mutual agreement. We are assured by the author that the source he refers to is neglected through sheer ignorance of its value, and of the best modes of turning it to account.

"Whatever may be the course of legislation on this subject," he remarks, "or the policy of the companies to avert legislation and keep affairs safely in their hands, it is certain every man has at his command, to a very great extent, the means of securing an abundant and perfect supply of water by the simple process of utilising the rainfall. In this year of agitation on the subject the rainfall has been more copious than has been known for many years, and has been almost wholly allowed to run to waste. There has been 'water, water, everywhere, but not a drop to drink.' Nor is the wanton waste in rainfall the only sin society has to answer for in the presence of a bountiful Providence. The cost of its removal by means of channels and drains is enormous, and the addition of the rainfall to sewage proper renders the utilisation of sewage impossible by reason of its unmanageable bulk and excessive dilution. Thus, the rain that we refuse to catch and keep adds to the burden of the ratepayer by every drop that falls, and is made the means of conveying to the sea, to be lost for evermore, those constituents of the soil that are the causes of fertility. We are prospecting among the hills and boring into the depths of the earth in search of water, while if we would but look to heaven we should have plenty, and the Divine assurance of heavenly drink for evermore. The rainfall in London averages 25 inches. One inch of rain falling on an acre of ground is 22,622 gallons, and, if there are 25 houses on that acre of land, the total annual rainfall is exactly that amount for each of them. Suppose only one-tenth of the total fall is caught and saved for household purposes, that is 2,262 gallons per house. The rainfall of the present year will greatly exceed the average, but exceptional circumstances should not be brought into the present consideration."

It happens that the few who in towns are familiar with rain-water as stored for domestic use have no great liking for it as a beverage, and the taste runs invariably in favour of spring water. But the author assures us this is a prejudice founded on misapprehension of facts and mismanagement of rain water. He says—

"The proposal to use rain water for any but the roughest purposes will surprise a few, and annoy many. Rain water is in bad repute, more especially in towns. Here and there we meet with an ill-looking water-butt, from which may be drawn a sooty fluid that is less remarkable for its sootiness than for its offensive odour, and sometimes for the plenitude of mysterious life it contains in the shape of wriggling and jerking creatures, whose activities indicate that the water must contain something substantial for their sustenance. It might be better to be content with the water supplied by the companies than to drink such filth as this, but the filthiness is profoundly instructive. The companies travel far and incur great expenditure to discover springs and wells; they construct great engines and filtering beds, and in various ways make a business of obtaining and preparing water for domestic use. But when the householder enters into the business for himself, he sticks up a secondhand rum-puncheon, without a cover, in the full sun, exposed to all weathers as a contemptible thing, and in due time complains that it stinks! Well, a leg of mutton would do the same thing. If water is worth having it is worth respectful and reasonable treatment, and when rain-water obtains this treatment it is better in appearance, better in flavour, better for cooking, washing, and all other domestic uses, than any other water, no matter from what source obtained. This subtle element acquires contamination of some sort the instant it touches the earth, and the contamination is in exact proportion to the nature and the solubility of the earth that constitutes the watershed, the water-course, the bed of the lake, and the reservoir. Hence, indeed, the endless diversities in the characters of waters, for wherever we travel we meet with water characteristic of the place—often too characteristic, so that it becomes a serious question, how best to die with it, or live without it. The immense use of aërated waters and 'mineral' waters generally affords testimony to the unsatisfactory nature of the prevailing supplies. But it is a grave question whether these conduce to the health of those who consume them. This, however, is beyond dispute, that many forms of disease, not the least of the number being urinary calculus and goitre, are direct results of the habitual use of waters impregnated with mineral substances that are never properly eliminated from the frame. The danger of mineralisation is made manifest in the constant endeavours of all concerned to obtain *pure* water, and the scrupulousness with which the percentage of organic and mineral matters in any particular water are noted and commented on. And when the purest water obtainable is obtained, it is but rain-water with the least contamination possible. What else is the water of Loch Katrine? The reason of its purity is that it is fed from a rock which yields but infinitesimally of its mineral constituents to the solvent powers of water."

The interest, therefore, turns upon the question, how should rain-water be caught and kept? We learn that darkness is one of the necessary conditions for the preservation of small quantities of water, and that therefore water-tanks should be always closed in. But the matter of chief importance occurs at the commencement of the business When rain begins to fall upon a roof it gathers various kinds of impurities, which are carried by the stream into the tank or water-butt. Mr. Hibbard points out that when the roof is well washed the further supply, if rain continues, is comparatively pure, and soon acquires, by mere subsidence or filtering, a beautiful brightness and a pleasant flavour, being then equal in purity to distilled water. It follows, therefore, that the first flow of water from a roof, whether in country or town, should be set apart for rough purposes, such as watering the garden and washing down the yard. And this, it is shown, can be accomplished without trouble, for by suitable arrangements of a purely mechanical nature the bad water may be made to flow in one direction and the good water in another. This is a matter of the utmost importance, for hitherto the sootiness of rain water has been its condemnation. Amongst the plans proposed, one comprises an arrangement of tanks by means of which the first supply is stored in a waste receptacle, and this being filled with the washings of the roof, the water passes directly to the proper storage tank, which may be fitted with a filter, so that every drop drawn within the house will be refined to the last degree. This affair is entirely self-acting, and needs but to be properly started to continue in action for several generations. Another plan consists in the adoption of a percolator, which may be roughly described as a double funnel. This is attached to the common stack pipe, and all that is needed in the way of extra apparatus is a separate pipe for the purewater and a tub or tank to receive it. When rain commences the percolator admits the air through the smallest of the two funnels, and passes it out to the waste as worthless, or, at all events, unfit for household purposes. But when the roof is well washed, the percolator, by mechanical action, turns on a swivel, and then the water passes through the large funnel to the supplementary pipe, and thus finds its way to the proper household storage. This apparatus, like the arrangement of tanks, needs no special attention, and, consequently, rain falling at night is sorted and saved with the same precision as in the daytime, all the watching required being to see that such things as dead leaves and sparrows' nests are not allowed to accumulate in or upon the apparatus to impede its working.

Mr. Hibberd proposes the formation of artificial watersheds on the cheapest land obtainable near small towns and villages, and the collection of the rain water by methods which effectually exclude the access of animals that might pollute the water. Examples of the utilisation of local rainfall are given, and a series of tables to aid in determining the proper sizes and capacities of pipes, tanks, filters, &c. It is scarcely necessary to remind our readers that all this has been proposed before, among others by Mr. Bailey Denton.

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CHIPS.

The street footpaths of the little town of Harleston, Norfolk, have just been laid with asphalte. The material is 2½in. thick, and is supported by a stone kerbing. The contract has been carried out by Messrs. T. Prentice and Co., of Stour-market.

A second Local Government Board inquiry into the much-vexed question of the drainage of the village of Bloxham, Oxon, was held on Tuesday week, before Major Tulloch, C.E. Mr. Edward Pritchard, C.E., of Birmingham, presented his plans and stated that the estimated cost, exclusive of four acres of land for which £300 an acre was asked, was £3,721. The inspector suggested that this sum was far too much to ask for the land, and made several suggestions as to the scheme; eventually it was decided by the representatives of the Banbury Rural Sanitary Authority to adopt the outline of the scheme, and omit for the present the side drains, and to take only 1¼ acres of land. The estimated cost of the revised scheme would be £2,150, exclusive of land.

The Scarborough Cliff Bridge Company are about to carry out plans prepared by Mr. F. W. Shields, C.E., for widening the deck of the bridge by 8ft. and other alterations to the structure. The estimated cost of executing these works is £3,340.

The Unitarian chapel, South Shields, was re-opened on Sunday week, after internal decoration carried out, at cost price, by Messrs. Laidler, of Newcastle-on-Tyne.

At a meeting of Presbyterians recently held in Edinburgh the Rev. Dr. Begg advocated the universal adoption of the Grecian style of church architecture in preference to the prevalent Gothic, and urged the removal of all ornamental crosses from designs for new churches for the denomination.

The new debating hall of the Oxford University Union Society, erected from the plans of Mr. Waterhouse by Messrs. Parnell, of Rugby, at a cost of £6,000, was formally opened last week.

A free library has just been opened at Chatham.

One of the Metropolitan Board of Works and local authority's street improvements was opened on Saturday. It consists of a widening of Mare-street, Hackney, at the bottom of the hill leading to Hackney Station and past the old town-hall, the total widening being over 150ft. in extent.

Evening classes are to be held this winter at the Royal College of Science, Dublin, which has hitherto only given regular and systematic scientific instruction during the daytime. The classes are voluntarily undertaken by some of the professors with a view to increase the usefulness of the college to the artisans and other grades of persons employed throughout the day.

Owing to gross carelessness, an explosion of gas took place in St. Mary's Church, Brecon, on Sunday, which wrecked the north aisle, smashing many of the windows in the church, including one of stained glass in the chancel.

The drainage board of Wood River district, which is situate in the counties of Dublin and Meath, have accepted a contract for the construction of drainage works and the reconstruction of several stone bridges, from the plans and designs of Mr. James Dillon, C.E. The works will be commenced as soon as possible, having been expedited by the authority to provide employment during the winter.

In view of the question of the opening of museums and libraries on Sundays, now being discussed at home, we note an item in Saturday's Australian mails, that the institute at Adelaide, S.A., had been opened on two Sundays, in accordance with the decision of the Assembly, and had been largely patronised.

Firth College, Sheffield, illustrated by us last week, was opened by Prince Leopold on Monday.

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* Water for Nothing: Every House its own Water Supply. By Shirley Hibberd. Effingham Wilson, Royal Exchange.

COMPETITIONS.

Bradford Technical School.—The council of this school having asked for competitive designs for the new school buildings, which it is proposed to erect on the site in Great Horton-road, opposite Manville Chapel, Bradford, fifteen sets were sent in. The cost of the building was limited to £12,000, the successful architects to have the erection of the building at 5 per cent. commission, and the second and third to receive respectively fifty and twenty-five guineas. The council have selected as first the design of Messrs. Hope and Jardine; second, Messrs. T. H. and F. Healey; and third, Messrs. Hargreaves and Bailey, all of Bradford. The elevations of the selected design are in the Italian style. The building will have frontages to Horton-road and Carlton-place, comprises a variety of rooms suitable for the work of the school and for the teachers and officers, and a weaving-shed, lighted from the north. The decision of the council has apparently given rise to dissatisfaction, and the following protest has already been lodged by one of the competitors:—

The Council of the Bradford Technical School, per Mr. G. C. Sim, Hon. Sec.

Gentlemen,—It is with regret that we feel constrained to lay before you the following complaints. One of the conditions reads, "Machinery in motion and all motive power must be away from the classrooms." That in the three premiated designs this clause has not been observed is most patent, and we venture to predict that if the building is erected as shown by the selected plans, an annoyance will occur through the close contiguity of the machinery to the teaching department. Although a small matter, why are the selected plans coloured otherwise than with sepia and Indian ink, when the Council went out of its way on the 8th ult. to insist that no other colour should be used? Of course, this is a small and minor matter; still, what is the use of conditions being made if they are allowed to be transgressed? Had a professional referee been appointed, as was urged upon the Council, we venture to think that the present selection would not have been arrived at, nor would the dissatisfaction we feared have become a certainty. We regret that we were induced by the half promise of the appointment of an independent and properly qualified judge to waste an amount of time and money over the affair.

Gloucestershire County Lunatic Asylum.—At the Michaelmas Quarter Sessions for Gloucestershire, held on Tuesday week, a motion was unanimously agreed to voting £150 to Messrs. Giles and Gough, of London, as the authors of the best design for enlarging the county asylum, and £75 to Mr. Pritchard, of Darlington, for the second-best design. Messrs. Giles and Gough were subsequently appointed architects for the portion of the extension to be proceeded with forthwith, which will house from 40 to 60 patients, at an estimated cost of £12,000.

Southport Convalescent Hospital. — The Board of Governors of the Cotton Districts' Convalescent Fund have awarded the first premium of £100 to the authors of "Sante," Messrs. H. J. Paull and A. A. Bonella, of No. 9, Montague-street, Russell-square, London; and the second premium of £50 to the authors of "Experience," Messrs. Oliver and Leeson, of Newcastle-on-Tyne. Mr. Alfred Waterhouse examined and reported upon the twenty-three designs submitted in competition, and the Board awarded accordingly. The building will cost about £25,000.

SCHOOLS OF ART.

Brighton.—The annual distribution of prizes to the students of the Brighton School of Art took place last week. The annual report stated that the number of students resorting to the school was greater than in any former year, the total number being 512, as against 490 last year. In the National Competition, two silver medals, three bronze medals, and two Queen's prizes—making a total of seven—had been given for works done in the school. There were nine awards last year. In the awards of the third grade, on work done in school, the decrease shown this year was considerable, the number of awards being 19, as compared with 32 last year. In the Elementary Examinations, held locally and called of the second grade—the subjects being Freehand and Model Drawings, Practical Geometry, and Perspective—there was a decrease of seven in the awards.

Old Ford.—On Tuesday night Professor J. Bryce, D.C.L., presided at the sixth annual meeting of the Old Ford-road School of Science and Art, and distributed the prizes and certificates to the successful students. During the present year 44 prizes had been won by the members, 113 certificates, and two scholarships of the value of £15 each. In addressing the meeting the chairman congratulated the inhabitants of the district on the great progress which the school had made within the seven years that had elapsed since its opening, and said he understood that the attendance in the day-school was 128, and in the evening class 75, 60 men having joined this year. Referring to the admission of ladies to the study of art, he said they all knew that one of the greatest difficulties of the time was the want of remunerative employment for women, employment by which they could make a respectable living, and yet at the same time be not too laborious for their physical strength. Nothing ought to have the consideration of right-thinking men more than the desire for women to earn a livelihood in a light, agreeable, and useful way, and he looked upon the art schools as particularly valuable in that respect. We had been so much occupied with making money in this country that we had forgotten the love of beauty, which was one of the truest, deepest, simplest, and most permanent sources of human happiness.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

North Staffordshire Naturalists' Field Club.—The last excursion of the season took place on Thursday week. The members left Stoke at 12·45 p.m., and arrived at Keele soon after one o'clock. They at once walked to Heleigh Castle. Mr. T. J. de Mazzinghi, of Stafford, then read a paper on "Heleigh Castle and its owners, the Audleys." After inspecting the two pieces of wall, the well, and a small portion of Early English arcading, with the springers for a groined roof, uncovered by some excavations made about fifty years ago, and which constitute the sole remains of the castle, the party went to a field at the back, from which a very extensive view was obtained. Descending the hill, the united clubs passed through the grounds of Madeley Manor to the village. They then walked through the village to the church, noticing on the way an old half-timbered house, "the Old Hall," which has along the front the inscription, "16 Walk knave, what lookest at 47 j s.b." The church was next inspected, and explained by Mr. Lynam, of Stoke. The oldest portion is the north arcade, which is of Late Norman work. It is remarkable for having two chapels, one at the east end of each aisle, and these form transepts. At the west end of the south aisle is an exceedingly beautifully stained-glaas window by Morris.

Northern Architectural Association.—The quarterly meeting of the Northern Architectural Association was held on Tuesday, at Newcastle-on-Tyne, the president (Mr. T. Oliver) occupying the chair. The President formally opened the twenty-third session of the association by reading an address, in which he dealt with the commercial depression, and the prospects of revival, the "education question" and its bearings on architecture, the "Sunday opening question," &c. On the motion of Mr. W. H. Dunn, the hon. secretary, seconded by Mr. Oswald, a vote of thanks was accorded to the president for his paper. Mr. Oswald, the vice-president, also read a paper, in which he said the existing collapse in the building trades was no doubt caused by the over-production during the preceding period of prosperity. The production of dwelling-houses (and he was speaking of them more particularly) was no doubt justified to some extent by the very great demand; but it was unduly encouraged by building societies, who made advances to speculators with little, if any, capital of their own. These advances were, in many cases, beyond the actual cost of the houses, and not only that, but beyond their value as security for the money advanced. Many of their inspectors or valuers, too, upon whose reports the directors relied, were interested themselves in getting large advances, and even where they were not interested, they were often men who possessed little knowledge of the real value of property, which could only be gained by experience over a number of years.

The Ruins of Palenque.—M. F. Maler describes in *La Nature* some important results obtained by him in a recent visit to the famous Mexican ruins of Palenque. Taking the Palace of Kings for his point of departure, he made excursions in all directions. He came upon innumerable heaps of stone, the last remains of once solid monuments. He found hundreds of houses, partly standing, partly demolished; small bridges; aqueducts in which, even now, the water flows so fresh and pure that M. Maler and his companions could not help taking a drink of it. M. Maler states that the new temple is at no great distance from the centre of the ruins, being quite close to the Temple of the Cross (known long ago), and the Temple of the Trophy. These three temples are situated at a short distance from the Royal Palace, towards the south-west—that is, in the direction of the Cerro Alto del Palenque, with their façades towards a little triangular space, of which they occupy the three angles. They are built on an almost identical plan, which may be called the typical plan of the temples of Palenque. Each of them is raised on a pyramid which, in the case of each of the temples already known, is detached on all sides, while in the case of the newly-found one it rests against the slope of the Cerro Alto. The distance of one temple from the other did not appear to exceed 150 metres, and of the commencement of one pyramid from another not 50 metres. On the platform of the pyramid, at a length of, perhaps, 40 metres, rises the newly-found temple, which, from its base to the verge of the stone roof, does not exceed a height of eight metres. It is built entirely of calcareous ashlars, dressed along the edges. The façade, or external part of the vestibule, once formed, like the two neighbouring temples, by four pillars which support the stone roof, has, unfortunately, already yielded to the sad work of vegetation, which is to be regretted, as the pillars were generally ornamented with superb figures in stucco richly painted. The bottom of the sanctuary, in the central chamber, is adorned with sculptures, the most curious at Palenque. They are executed on three slabs of calcareous stone, of one metre 81 centimetres in height, by two metres 89 centimetres in total breadth. The two pillars which support the vault of the sanctuary were formerly, as in the other temples, decorated with sculptured figures on large slabs of calcareous stone, which unfortunately have disappeared. Some fragments of these figures, representing richly vestured personages, still lie on the threshold. The sculpture at the bottom of the sanctuary is still perfectly preserved and quite visible, notwithstanding its feeble relief. On a species of pedestal rises a cross, of a design even more striking than that of the neighbouring temple so well known. The cross is surmounted by a strange head, bearing on its neck a collar with a medallion. Above the cross is seated a bird with a hieroglyphical head; to the right, a man is placed on a graceful leaf-ornament. This personage is not habited in the manner of the great lords of Palenque; he represents, without doubt, one of the people, as does the woman on the opposite side; the latter holds in her hands an offering. Both man and woman have the mouth open as if speaking. Four rows of *Katun* (or magic writing signs), on the right and left of the group, contain, no doubt, the legend as to the worship to which the temple was dedicated, and the epoch of its foundation.

CHIPS.

The half-yearly meeting of the Sanitary Inspectors' Association of Essex and the Neighbouring Counties was held on Tuesday. Mr. Godfrey, of Braintree rural district, in the chair. A paper on the Government system of conservancy was read by Mr. G. H. Matthews, of Halstead urban district, and fully discussed.

In connection with the Sherborne Art Club an exhibition of modern pictures, and of works from South Kensington, has been on view at the town-hall of Sherborne. On Thursday week the Department prizes and certificates awarded to students in the local school of art and Abbey school were distributed in the same room.

A smack boys' home is about to be built below the cliff on the Military-road, Margate, from the designs of Mr. Pite, of that town.

The Irish Fine Art Society will visit Cork on the 3rd prox. to open its sixteenth annual exhibition in that city. The exhibition will remain open for three weeks.

Building Intelligence.

Cambridge.—The corner stone of Ridley College, Cambridge, was laid on Friday last. Mr. C. L. Luck, of Carlton Chambers, Regent-street, London, is the architect. It is intended to begin with accommodation for 20 students (at least that is the design), each of whom will have two rooms—sitting and bed-room—of comfortable size. The lecture-room will be 41ft. long by 22ft. wide, and 20ft. high, with rooms over. The dining hall will be of about the same dimensions, but with an open-timbered roof, and with kitchens beneath. The total length of the building will be 225ft. There is room on the site for cheaper and additional rooms to form the fourth side of a quadrangle. The building is being erected with Suffolk red brick facing and Ancaster stone dressings for doors and windows.

Carrick-on-Shannon.—The new R. C. parochial church of St. Mary Major was dedicated on Sunday. The previous edifice on the site was blown down during a violent storm on January 19th, 1875, and the work of re-erection has been carried out from the designs and under the superintendence of Mr. W. M. Hague, F.R.S., of Westland-row, Dublin. The building stands on a commanding site, and consists of nave and aisles, chancel, and a side chapel with sacristies at the gable end, and a large tower flanking the western gable. The extreme dimensions are 170ft. long by 60ft. across, and 60ft. from floor to apex of roof. The style is Early English. The aisles are divided from the nave by a series of tile-pointed arches of displayed brickwork, supported by polished red Aberdeen granite columns, with moulded bases and caps, dividing the length into seven bays; the eastern adjuncts to chancel have semicircular ends. The external walls are built of limestone, hammered and pointed, with chiselled stone dressings throughout; the internal surfaces are plastered. The roofs are open, and formed of principals with carved braces and spandrel interfilling, and ceiled under the rafters with pitch-pine boarding divided into panels. The east and chapel windows are filled with stained glass. The flooring of the church is boarded under the seats, the latter being of pitch-pine stained and varnished, and all the passages are laid with flags and encaustic tile borders. At the west end is an organ-gallery.

Corporation-street Schools, Newcastle-on-Tyne.—From a very humble beginning, these schools have attained an importance little contemplated by their promoters. A short time since Lord Hartington opened the new science and art rooms, which complete the scheme for the present. Accommodation is now provided for upwards of 1,400 scholars, who are received as infants, and can if they like rise step by step till they may matriculate for the London University. The science and art rooms give accommodation for about 400 students, and consist of chemical laboratory for 36 students, with professors and weighing-room, chemical lecture-room, natural science class-room, modelling, painting, and antique rooms for art students, with various other class-rooms for general purposes. There is also provision made for classes to learn cooking. On the ground-floor is a large gymnasium. The works were very satisfactorily carried out by Mr. Humphrey Atkinson, contractor, of Blaydon-on-Tyne, from the designs and under the superintendence of Messrs. Oliver and Leeson, architects, of Newcastle-on-Tyne.

Godalming.—The parish church was reopened on Thursday, the 16th inst., after restoration from the designs of the late Sir Gilbert Scott, and, since his death, of Mr. J. Oldrid Scott. The history of the fragments of all ages of building of which the church consists has been elucidated during the progress of the works. The earliest portion appears to be the chancel arch of a Saxon tower, probably that mentioned in "Doomsday." Norman builders converted this into one side of a tower forming the centre of a cruciform church. The remains of windows and a priest's door show that the aisles were not added till the end of the 12th century. At that time the windows were walled up, and on the removal of the filling-in of rubbish the old plaster was found still adhering to the walls, with traces of colouring upon it. On the side of one of a row of filled-in lancet windows, has been found a rude and early half-length painting of St. John the Baptist, holding in his hand the Agnus Dei. All these remains, which are unusually complete, have been carefully preserved. The western arch of the tower, being very narrow and low, has been removed and replaced by a wider and higher one. The wall above having been found to be in a dangerous condition, owing to recklessness of construction, measures were taken to secure the tower. After being shored, a series of connected iron ties, specially designed, was introduced, and portions of the wall were removed and rebuilt. One of these ties crosses the chancel, and at the level of the capitals, and is ornamentally treated, having an iron cross upon it. The eastern tower arch has also been raised, the old stones being reused. The side galleries have been removed, and the aisle walls, which were only fifty years old, have been taken down and extended outwards, and also westward, and new windows of Decorative design placed in them. The new west window of the nave is from Mr. J. O. Scott's design. A portion of a series of new choir stalls has been placed in the chancel, which has been repaved with Godwin's encaustic tiles, the marble slabs and brasses being set into them. The old vestry on the north side has been restored to the old use indicated by its presence, and will be occupied for week-day purposes, the old chancel altar and cloth being placed in it, and the walls and floor being covered with red tiles. The chancel has been left unfinished until further funds are forthcoming. The organ at present occupies the north transept. The stucco has been removed from the exterior of the walls and tower, and the corbels of the tower that had been replaced in oak, now rotting, have been again restored in stone. Mr. Ralph Nevill, F.S.A., acted as clerk of works; Messrs. Putnay, of Dorking, were the contractors, and Mr. Spicer the foreman.

Hexham.—The Hexham Board Schools, after undergoing extensive alterations and improvements, were last week reopened for teaching purposes. Internally the buildings have been completely altered in their arrangements, in order to obtain proper supervision by the head teachers in their various departments. Cap-rooms, lavatories, and teachers' rooms have been added, and considerable additions made to the amount of window area. A complete system of ventilation and heating has also been provided. The works have been carried out by the following contractors,—viz., M. Dodd, mason; W. Dodd, joiner; J. Baty, slater; J. Rutherford, plumber; J. Dinning, painter and glazier; Messrs. Davison and Spencer, heating and ventilating apparatus. Mr. Edward Snowball acted as clerk of the works, and Messrs. Oliver and Leeson, of Newcastle-on-Tyne, were the architects.

Hove.—The new Board schools in Ellen-street were opened on the 10th inst. They have been built by Messrs. Hook and Oldrey, of London, from the designs of Mr. T. Simpson, of Brighton, and Mr. T. A. Roper, of London, and have been illustrated in the Building News. The ground floor is set apart for use as an infants' school, and comprises a large room with four class-rooms. The boys' and girls' department upstairs consists of one large room, three class-rooms, lavatory, private rooms for the master and mistress, and a kitchen in which cookery lessons are proposed to be given, and which is fitted up for the purpose. The fittings were supplied by Messrs. Colman and Glendenning, of Norwich. The playground is large, and is partly under cover. The cost of erection has been about £6,000.

Metropolitan Board of Works.—At this board, on Friday, a deputation from the vestries and local boards of the metropolis attended to present a memorial with reference to the private bars of the metropolis, agreed to at a representative meeting held at St. Pancras vestry on the 10th inst. The memorial, which was spoken to by Mr. Westmacott, urged the expediency of taking action to remove the gates and bars across London thoroughfares, on the grounds of the inconvenience and annoyance, delay, and even danger caused by them; and the board was asked to promote a Bill in the next session of Parliament for the removal of all gates and bars from the streets and thoroughfares of the metropolis, and for preventing the erection of similar obstructions in future, where the cost of paving, lighting, cleansing, maintaining, and sewering such streets and thoroughfares is defrayed out of the rates. The memorial was referred to the Works Committee for consideration and report. Complaints having been made by the vestries interested as to the insufficiency of the improvements in progress near the Angel at Islington, the engineer to the board was instructed to have the building-line set back so as to give as great a width to the roadway as may be attainable without taking additional property. The interminable "Haymarket Dangerous Structures" case came again before the board, resolutions being passed approving of the superintending architect's action in instructing the contractors, Messrs. J. and J. Greenwood, to take down at once No. 1, Arundel-place; the same contractors were instructed, amongst other works, to take down the notorious party-wall between Nos. 28 and 29, Haymarket. With reference to the statements which have appeared in the public press with respect to the means of egress provided at Gaiety Theatre in the Strand, the Building Act Committee reported that, having received a full report upon the structure of the theatre from the superintending architect, accompanied by a plan, made under his direction, of the building and its approaches, they were of opinion that the existing arrangements are fairly satisfactory. A disagreement between the architect and works committee of the London School Board and Mr. Charles Fowler, district surveyor St. Leonard's, Shoreditch, and Norton Folgate, with regard to the construction of a staircase in the female teachers' rooms in the upper part of the Board Schools in Haggerstone-road, came before the board by adjournment. The staircase and landing in question have been made of wood, whereas the district surveyor considers that they should be of fireproof material, and the case was said to be a test one. Mr. Runtz quoted the 3rd section of the Building Act of 1855, which interprets "public building" to mean "every building used for purposes of public instruction," which he contended would include all Board Schools; and the 22nd section, which runs that "In every public building the floors of the lobbies, corridors, passages, and landings, and also the flights of stairs shall be of stone or other fireproof material, and carried by supports of fireproof material." He moved a resolution supporting the requirement of the district surveyor. On behalf of the School Board, several members, who also have seats upon that board, urged that fireproof staircases were unnecessary in teachers' rooms, and would be a needless expense to the ratepayers. Mr. Selway said that the architect to the School Board had made a gross mistake, and when called to account by the district surveyor would not remedy it; and the resolution was carried by a large majority.

Oldham.—The new building added to the Town Hall at Oldham was opened last week. The new building is situated in Greaves-street, at the rear of the old Town Hall, and connected therewith by a flight of steps leading from the present staircase, and opening out into a spacious hall in the new structure. The building is of such a character that if at any time it were decided to take down the present old building the one just erected would form one of the side wings of the completed scheme, and would entail no cost whatever in alteration. The Greaves-street elevation is built entirely of stone, and is in the Classic style, with square columns and capitals of the Corinthian order. The main feature of the design consists, first, of a basement, the upper mouldings of which indicate the level of the ground floor. Above the basement the columns run through two stories, and carry the main architrave and cornice, which is surmounted by an open balustrade, with solid piers at intervals. A prominent feature in this elevation are the two ventilating turrets from the cells. Between the wall columns are the ground and first-floor windows, the former with square heads, the latter with circular arches. The Mill-street elevation has been designed with a view to its subsequently forming one side of an open square; and to preserve the light as much as possible it has been faced with white glazed bricks. The whole of the works have been carried out from the plans and under the superintendence of Mr. George Woodhouse, architect, Bolton, and Mr. Edward Potts, architect, Oldham. The cost of the whole of the alterations, including furnishing and decoration, has been about £24,000. Mr. James Martin was the Clerk of the Works.

Old Hill.—A group of buildings, consisting of Church of England schools and working men's institute, have just been given to the inhabitants of Old Hill by Mr. G. A. Haden Best, and were opened last week without ceremony. The style is that of English Gothic architecture of the early part of the 15th century, freely treated. The buildings are constructed of the ordinary local bricks, selected for faced work, and relieved with Bath stone dressings. The buildings are divided into three portions, viz., school-rooms, workmen's club, and curator's residence, with depôt for the sale of pure literature. The schools consist of a large hall, 96ft. by 55ft., capable of seating about 1,000 children, upon the ground floor, in classes of 15 each, and two rooms for infants, each 35ft. by 30ft., giving accommodation for 400, or a grand total of 1,400 children. The large hall is also designed for use as an assembly room, being provided with a gallery, approached from the main entrance by a stone staircase, and, with the gallery, seats 2,000 persons. The third division consists of a commodious front shop for the sale of pure literature, and the curator's residence. The total cost of erection, exclusive of the site, is £9,000. The works have been carried out from designs and under the superintendence of Mr. J. T. Meredith, architect, Kidderminster, by Mr. W. Nelson, contractor, Dudley.

Penrith. — A porch, designed by Messrs. Hetherington and Oliver, of Carlisle, has just been completed in front of Mr. John Smith's residence at Penrith. It has been erected in order to shield the entrance to the house from the windows of new houses opposite just completed (also from Messrs. Hetherington and Oliver's designs). The porch consists of oak framing on a low dwarf wall, and entirely filled with stained glass of elaborate design, by Messrs. Gibbs and Howard, of London. The joiners' work, executed by Mr. Jos. Pattinson, has been framed together for twelve months in order to be thoroughly seasoned before fixing, and thus avoid chance of injury to the glass.

Salisbury Cathedral.—The memorial pulpit to the late Archdeacon Honey is nearly completed. The design was prepared by the late Sir Gilbert Scott, and is in the later phase of Early English, of about 1260. It consists of a polished Purbeck marble plinth, on which is a central shaft and seven outer clustered shafts of the same material, which support the pulpit itself. From these spring small arches and carved brackets of Tisbury stone, surmounted by a moulded Purbeck marble string, on which rests the body of the pulpit. This, which is of Tisbury stone of fine texture, is the chief part of the design. It is heptagonal in plan, each face being recessed, thus forming a niche, and having richly moulded canopies, the spandrels being ornamented with symbolical figures of angels in bold relief. The whole is finished by a deep moulded capping of Purbeck marble. In each niche is a figure, viz., Noah, Elijah, Jonah, St. John the Baptist, St. Peter, and St. Paul. In the seventh face is the opening to the pulpit, ascent to which is gained by ten steps of Tisbury stone, having moulded and carved ends, and an ornamental balustrade and rail, the work of Messrs. Skidmore and Co., of Coventry. The total height of the pulpit is nearly 10ft. The figures were sculptured by Messrs. Brindley and Farmer, of London; and the remainder of the work has been executed by Mr. G. P. White, of London, who has the contract for the whole.

St. Leonard's-on-Sea.—On Tuesday, the 14th inst., Mr. Thomas Brassey, M.P., and Mrs. Brassey, opened the new buildings which have been erected for the Warrior-square Concert Room Company (Limited). After the ceremony of declaring the building open, a banquet was held in the large hall, and in the evening a performance of the "Messiah" was given, conducted by Dr. Abram, at which about 1,500 people were present. The buildings consist 'of the large hall 96ft. by 57ft., and several smaller rooms available for club purposes, dressing-rooms, &c., and for small meetings, for which the large hall would not be required. There is also a considerable extent of cellarage accommodation. The works have been carried out by Mr. F. Cruttenden, of St. Leonards, under the superintendence of the architects of the company, Messrs. Richard A. Hill and W. L. Vernon, at a cost exceeding £10,000. The building was illustrated in the Building News for January 18th, 1878.

Yate Church, Gloucestershire. —Various works have been lately done to the chancel of this church at the expense of the rector, the Rev. A. Pontifex. The stonework and walls have been repaired, the stalls and pulpit rearranged, a low stone screen and some carving added, and a rich tile pavement, of the Campbell Company's antique make, laid down. A rich east window, by Burlison and Grylls, has also been erected, in memory of the rector's father. The work has been done under the direction of the architect, Mr. Ralph Nevill, F.S.A., of Godalming and Gray's Inn. The carving is by Mr. Harry Hems, of Exeter.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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T. (Not yet.)—C. N. (Index to last half-year's vol. published second issue in July.)—B. T. S. (Next week.)—J. C. (See current No. of *English Mechanic*.)

"BUILDING NEWS" DESIGNING CLUB.

A. (Our rules do not debar architects from competing, and there is no limitation as to age.)

Correspondence.

THE R.I.B.A.: ITS FURNISHINGS.

To the Editor of the Building News.

Sir,—I understand that the furnishings and finishings of the Institute's new rooms are now being rapidly proceeded with, and that Mr. Anderson, the architect, has superintended, if not designed, the decorations, which are in the Adams style; but can it be true that Mr. Octavius Hansard—assisted of course by Mr. W. H. White, the secretary—was elected to make the selection of the chairs and carpets for the council-chamber? I am told that these gentlemen chose these single-handed and alone a few days since. Perhaps the same names constituted the "Committee of Taste" in connection with the passing of designs for the Northumberland-avenue. If so, is the art merit of the new grand hotel at Charing-cross to be taken as a criterion of the beauty and suitable character of the finishings and furnishings of the Institute's own rooms? Surely the council-chamber, the very areopagus of architecture and the applied arts, should be the beau-ideal of taste, and should offer a fitting example for the small fry to follow. "Too many cooks," they say, "spoil the broth"; but if I am correctly informed, there must be no needless alarm as to a hash being made on this account, as Messrs. Hansard and White are said to be the cooks in question.—I am, &c., An Old Tee Square.

SHEFFIELD.

Sir,—I venture to correct several inaccuracies into which your correspondent who wrote the article on "Sheffield" in your issue of the 10th inst. has doubtless unwittingly fallen.

Messrs. Handyside and Co., of Derby, are not the contractors for the Norfolk Drill-hall, but for the ironwork of the hall roof only, Messrs. G. Wade, bricklayer and mason, Armstead and Vasey, carpenters, &c., J. B. Corrie, plumber and zinc worker, and others having undertaken the respective works.

Your correspondent, in his notice of the new cemetery for the Sheffield Burial Board, speaks, *inter alia*, somewhat prematurely, of the Catholic chapel to be erected at the expense of the Duke of Norfolk as "the best of the three." This is calculated to mislead, and we beg to say the design has not yet been submitted, and it will be simpler in character and smaller than the others, which are of some importance, and will have mortuary aisles.

The statement that St. Marie's Church, Norfolk-row, was built 28 years ago (in 1851) is incorrect. The design was made by my father and his partner, the late Mr. J. G. Wiightman, in 1846, and the exterior was completed under their care early in 1850, the solemn dedication taking place in September of that year. This church was the last and best of a series—St. John's Cathedral, Salford; St. Marie's, Burnley, St. Chad's, Manchester; and many others—built early in the Revival, and while the authors were together diligently and carefully studying and measuring the neighbouring Yorkshire and Lincolnshire churches of the Curvilinear and Rectilinear periods. Before they made the drawings of St. Marie's, Sheffield, the glorious church at Heckington was visited and measured thoroughly, and I need hardly observe that in the new works described by your correspondent the same tradition is being religiously adhered to.

I must apologise for trespassing on your valuable space, and am, &c., C. Hadfield.

Corn Exchange Chambers, Sheffield,
20th October, 1879.

THE DAIRY HOMESTEAD COMPETITION.

Sir,—I learn from one of my fellow-judges in the class for drawings of dairy homestead at the Dairy Show last week that you approved of our choice falling on the drawings exhibited by Mr. Moore.

I may tell you that we awarded the first prize to "In Toto," because his drawings appeared to us to be at once elegant and economical, well arranged with a view to the saving of time and labour in attending to the cattle, equally well arranged with a view to the convenience of the dairy, and compact, symmetrical, and convenient throughout. The different kinds of stock were disposed of in a manner which appealed at once to the approbation of a practical dairy farmer; the cows were handy alike in the dairy and for the commissariat; the pigs were far enough away from the dairy, and yet so that they could be conveniently fed, and the calves were placed where they could receive plenty of fresh air. There were, no doubt, certain details of construction which might not please everyone, but these are easily modified without interfering with the general plan of the buildings; and the chief objects we sought for were simplicity and convenience of arrangement, combined with a general practical adaptation to the needs of modern dairy-farming. These points, we considered, were better brought out in "In Toto's" drawings than in any other set exhibited, nor did we find reason to alter our award when we had examined the three sets of Mr. Waite's drawings, which had been accidentally mislaid. If you wish to do so you may make use of the foregoing. J. P. Sheldon.

Sheen, Ashbourne, Derbyshire, Oct. 22.

[Another of the judges—an old friend and correspondent of the Building News—writes us:—"Your leading article in last week's paper confirms our good judgment. Three sets of drawings were overlooked and consequently could not be looked over until two days after our judgment was given, but we went through the lot again after, I presume, your reporter had left, and as one of them would have been, if seen at the time we first examined the drawings, *second* instead of the one *placed* second, we awarded it a special prize of silver medal and £5 (a mid-position between the original 1st and 2nd). The first prize, spite of a few faults in detail, was a clear win. The *special* prize was by Mr. Waite, of Duffield, Derby." We think the competitors are to be congratulated on the care and intelligence displayed by the judges—whose conduct contrasts favourably with that of the judges at the late Kilburn Show.—Ed. *B.N.*]

DAIRY SHOW, AGRICULTURAL HALL.—CLASS 62: COMPETITION FARM PLANS.

Sir,—If you have sent a representative to examine the farm plans, he probably would not know, unless he was at the Hall on the 15th inst. that I have been awarded a Special First Prize and Silver Medal for my plans of Dairy Homestead, No. 852 in Catalogue.

The plans were delivered at the Agricultural Hall in due course, but afterwards mislaid by the manager of the Hall, and not found until after the judges had made their awards.

When my plans were found, the judges examined and compared them with the others, and awarded me as above stated, making the third silver medal I have won for farm plans and buildings in 13 months, viz.:—One in September, 1878, for moveable cattle-shed at Derbyshire Agricultural Society's Show; one at Kilburn Royal Show, 1879, farm plans; one at Dairy Show, 1879, farm plans.—I am, &c., R. Waite.

NEW SADLER'S WELLS THEATRE.

Sir,—In the account of New Sadler's Wells Theatre published in the Building News of the 17th inst. it is stated, "the staircases are constructed of stone." Writing of these staircases on September 6th, the architect of the building, Mr. C. J. Phipps, F.S.A., states, "they are, in my opinion, preferable to stone." Each staircase is, in fact, a *monolith of fireproof concrete*. Stone staircases, usually *called* fireproof, are merely incombustible, but are easily destructible by fire. However, the staircases at New Sadler's Wells, having neither stone nor iron in their construction, are of concrete, compounded of materials specially selected and prepared for fire-resisting capacity, would perfectly resist fire and enable an audience to leave the building in safety and at leisure, even in the midst of a fire. We will be much obliged if you will kindly correct the error in your next, as otherwise we may suffer loss, having stated in much of our correspondence that we had made these staircases in concrete.—We are, &c.,

Charles Drake & Co. (Limited).

Railway Wharf, Battersea Park, S.W.,
October 20th.

GIANT OAKS.

Sir,—The Rev. Basil Edwards' question in last week's "Chips" as to the largest oak in England will perhaps be answered by those acquainted with the subject. The following information has been gathered from books:—

Great Salcey Oak: circumference at ground, 46ft. 10in.; at 1 yard high, 39ft. 10in.; reputed age, 1,500 years.

An oak was felled in 1810 in Newport, Monmouthshire, 28ft. 6in. circumference, 400 years old. The timber sold for £670; the bark for £200.

"The Parliament Oak," Clipstone-park, supposed to be 1,500 years old.

Welbeck Abbey, "The Duke's Walking-Stick": 112ft. high, covers 700 square yards, and has a coach-road cut through it.

"The Two Porters" are 100ft. high.

"The Seven Sisters" has seven stems 90ft. high.

The largest oak in England is in Calthorpe, Yorkshire: it measures 78ft. in circumference where it meets the ground.

The largest oak tree seen personally by the writer is in the district of Chirk, North Wales, near a small village called Col-ke-Hoy (spelt phonetically): it measured 51ft. in circumference at 3ft. 6in. from ground. It is fair to state that, although the writer believes the measurement to be correct, it was not measured with a tape or line.—I am, &c., J. D. J.

Liverpool, Oct. 20th.

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The bridge over the Calder at Ponsonby, having become dilapidated, has been ordered by the Cumberland magistrates to be rebuilt from plans to be prepared by Mr. John A. Cory, the county surveyor.

Intercommunication.

QUESTIONS.

[5921.]—**Liquid Waste from Dye Works.**—Can any reader of "Intercommunication" give me any information or particulars of a simple and efficient system of treating liquid waste from dye works, so as to purify it sufficiently to meet the requirements of the Thames Conservators before passing it into the river? Would filtering it through a bed of gravel or similar material be sufficient, or must it be treated chemically? Any information of a practical nature will be esteemed a favour.—Thames.

[5922.]—**A Family Profession.**—In your issue of the 3rd inst., under the above heading, Mr. Hems states that on the occasion of the last stone of St. Paul's Cathedral being laid it is recorded that Mr. Strong was present. In Elmes's "Wren and his Times," the date of Strong's death is given as 1681, some 29 years before the cathedral was finished. Which is right?—Wm. G.

[5923.]—**Shadows.**—In designing a country villa residence for national competition at South Kensington, I have prepared four plans of the several floors, &c., and four elevations of the sides, which I have called respectively north, south, east, and west. They are drawn in ink and coloured with flat tints, but I wish to put on the principal shadows. In other works of this kind I observe the shadows are drawn as if the sun were to the left of spectater, and in front of picture plane, and occupies the same position with regard to each elevation, no matter whether N. E. S. or W. Now as the north elevation is never exposed to the sun the effect produced by this method is not only wrong but very deceptive. Can any of your readers explain this? I observe the same rule is used in "backlining."—W. Griffiths.

[5924.]—**Painting on China.**—Will one of your readers kindly afford a little information on this art? Are the technical difficulties of the process great? What are the comparative advantages of over and under-glaze painting? Does amateur work, not of the highest excellence, find a sale, and what is the best hand-book on the subject?—F. S.

REPLIES.

[5907.]—**Damp.**—"C. F. M.'s" question in Saturday's Building News would have raised a more important issue if it were not quite so personal. If he had inquired whether it was of any consequence my having ascertained by actual experience that to sleep in all weathers with my windows open did one no harm, no matter how damp and foggy the weather, the answer, I think, must be that such fact is of great importance. I am much disposed to believe that the mistaken apprehension of evil results from exposure to "damp" and "draughts" and the consequent exclusion of the outer air from our houses, leads to more illness than most people imagine, and it would be conducive to the public health if we were only generally aware that the amount of damp which prevails in the outer air in our climate at any time of the year is entirely harmless, if we only keep up the normal temperature of the body by sufficient clothing or other means. This, surely, is a matter worthy of careful and scientific consideration.—P. D.

[5916.]—**Levels of Sewer Inverts.**—In reply to "H. J.," I am very pleased to learn that there are "*various* methods of giving the level of a sewer invert to the contractor on the ground." At present I know only of one and submit it, not as the best, but as a good one. Assuming then that the supposed 500ft. sewer is straight, or nearly so, and that the proper level at the lower or outfall end is accessible, the following assumed figures will illustrate my method.

Reading of staff on existing invert being at lower end of proposed new sewer	13·72
Deduct for 6in. step at junction	·50
∴ Reading on new invert would be...	13·22

500ft. at a fall of 1 in 272 = 1·84ft. nearly (vide question).

Deduct 1·84, giving corresponding reading on invert at *upper* end of new sewer	1·84
	11·38

A peg should be driven on the line of sewer, and exactly over its *upper* extremity.

Suppose reading on this peg.....................	2 52
Reading on new invert as above	11·38

The difference (8·86) gives the depth of new invert below this peg. As sewer contractors generally despise decimals, I find it necessary to give this in feet and inches (8ft. 10¼in.). If the profile fixed at the lower end is 14ft. above new invert, that at the upper end will have to be fixed 14ft. — 8ft. 10¼in. = 5ft. 1¾in. above the peg.—C. R.

[5916.]—**Levels of Sewer Inverts.**—The best method for giving the level of a sewer invert in "open cut" is by means of sight rails and a boring rod, which can be fixed at any distance apart to suit line of sewer. The sight rails mostly consist of two uprights and a cross rail, the latter with a perfectly true edge; the boring rod can be made any length with a movable cross-bar or T, so that it can be adjusted to any length required to suit depth of cutting. Then, for example, if the value of the invert at 0 is 20 00 above O.D., and the surface of ground 35·00, the cutting will be 15ft. deep, then a boring-rod 20ft. long would be most convenient. Thus—

Valve of invert at 0	20·00 above O.D.
Boring-rod	20·00
Value of sight rail at 0	40 00
Value of invert at 50ft. .... (With a gradient of 1 in 272)	20·18
Boring-rod	20·00
Value of sight rail	40·18

And so on, the value of the sight rail at 500ft. being 41·83. With the use of the boring-rod pegs can be put in at any point between the two sight rails, and a perfectly true invert obtained. If the work is in tunnel the safest way would be to give the levels in the bottom at every tenth (which is mostly 12ft.). This can easily be done even in a small sewer with short level legs and a folding staff. In some instances a level peg is given at the bottom of a shaft or shafts, and the levels for the invert obtained by means of a hand level and straight edge, but this method is very liable to cause errors.—A. L.

[5919.]—**Tarred Wood.**—This is a question with us that is not fully understood, and as it is a fair subject for ventilation in the columns of "Intercommunication," I beg to submit the following remarks:—The application of tar to wood exposed to the weather is beneficial in any form. The prime object in these cases is to preserve the wood against decay. Now as decay in wood is attributed to a secondary form of parasitic vegetation, the application of tar is poisonous to the plants or fungus, and hence it prevents their growth, and offers a groundwork upon which they cannot feed. All compositions coming under the heading of wood preservatives, be they metallic, vegetable, or mineral, have this quality of being poisonous to the low forms of vegetation by which wood is destroyed. The best mode of preserving wood is to inject these compounds by mechanical means into the wood. Away from this, it becomes a mere question of painting or coating the surface to keep out the water, without which decay is impossible. The most ordinary material for this purpose is paint, the next is creosote oil, following which we have Stockholm or wood tar, and, lastly, coal tar. "Agricola," is his question, no doubt alludes to the latter composition. We may here say that raw coal tar is a poor weak material. It is much better in a boiled form mixed with a mineral to give it consistency and setting power, say, red or yellow ochre, fine brick dust, or any dry earth, but in no case is coal tar such a good preservative as wood tar. This material, used in a boiling state, mixed with ochre, forms a coating of the most durable character, and any observer may see wooden erections so treated in the neighbourhoods of old timber yards, which appear to be proof against time. The use of tarred wood in this country has never been general, and of late years, owing to its affinity for fire, it has become rare. For its development we must turn to the north of Europe, where wood is the material of construction, and where the application of tar as a preservative is as old as the hills. The builders there will not apply it until the wood in its position has become seasoned, and the moisture is fairly out of its composition, for they know that dry-rot ensues when moisture is sealed up in the wood. With this point in view they allow their erections to season for one or two summers, when the shakes, cracks, &c., are tightly caulked up with oakum, and the surface is then coated with boiled wood tar and red ochre in the form of thick paint. The proportion of ochre the tar absorbs is so great that the composition is an Indian red, a colour when applied to the buildings that lends a charm to the rural landscape. The retarring of wood is a mere question of judgment, the same as repainting.—W. S. Hull.

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WATER SUPPLY AND SANITARY MATTERS.

Melton Asylum.—The sewerage and drainage systems of the Suffolk county pauper lunatic asylum at Melton are in progress from plans by and under the superintendence of Mr. H. M. Eyton, of Ipswich, the county surveyor. The sewage of the whole building is conveyed by 12-inch glazed pipes and discharged into a cistern, having outlets to two receiving tanks, 30ft. by 15ft. and 7ft. 6in. deep. These are all constructed of 18-inch brickwork and Portland cement. Two sluice valves are fitted so that the sewage may be turned into one or other of the receiving tanks from which it discharges itself by siphons from either tank. The first cistern has iron gratings to prevent the passage of anything but the semi-liquid sewage, and the latter is collected into one or other of the large receiving tanks, where a further deposition of heavy matter takes place. The remaining liquid is then passed on through siphons, and flows into a system composed of 54 open conduits, in which it stands and percolates into drains about 7ft. from the surface. These drains lead to a well into which the liquid falls, perfectly clarified. The conduits are arranged in six sections with stop-gates allowing of the use of any one or more at a time. The system is self-acting from the siphons, and the receiving tanks have a sliding galvanised iron roof to allow of closing them in during use, and thus preventing the escape of effluvia. The contractor is Mr. H. Dove, of Woodbridge by whom also a new bath and other works at the asylum are being carried out under Mr. Eyton, from whose designs the whole of the north side has just been rebuilt.

Taunton.—A compensation reservoir is in course of completion at Leigh Hill for the town council in connection with the water supply. The works were commenced in April, and have been uninterruptedly carried forward. The puddle trench in the centre of the dam has been completed, and the excavation with the site is being proceeded with. Mr. Edward Easton, C.E., is the engineer, and Mr. Crokam the contractor for the works, which are being carried out under the supervision of Mr. F. Foulkes, C.E., Mr. H. J. Smith, borough surveyor.

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A public mortuary is about to be built in East Grinstead cemetery for the local burial board, from the designs of Mr. Charlwood.

The county magistrates of Cumberland have just completed the purchase, at £2,500, of a piece of ground at Grayson Closes, as a site for industrial schools, and have submitted plans for the building prepared by Mr. Cory, county surveyor, to the Home Secretary for approval.

LEGAL INTELLIGENCE.

Chapel Deacons and a Contractor at Variance.—Serjeant Tindal Atkinson, sitting at the Leeds County Court on Monday, heard a case in which Mr. Charles Yeudall, one of the deacons of the New Bethel Chapel, Wortley, as representing the committee of management of that community, sued William Platt, contractor, of Skipton, to recover the sum of £21 for money paid to him, and for which no consideration had been received. Mr. Dunn appeared for the plaintiffs, and Mr. Robinson for the defendant. The evidence disclosed that last August the committee, having obtained funds by subscriptions and in other ways towards a new chapel, selected a site for its erection at Wortley. At a little distance away the defendant was engaged in pulling down a chapel, the land occupied by which was required by the Great Northern Railway Company, and they saw him with a view to the purchase of the roof of that structure, for their new building. After some discussion, the bargain was struck for £21, the roof to be delivered to the plaintiffs intact; and the pews of the old building were also bought for £11. On the delivery of the pews the defendant was paid for them, and as he asked for the money for the roof, that also was given him. The following Saturday the roof was left in an insecure state by the workmen, and being further weakened during the night by a storm of rain, it fell, smashing the timbers into several pieces, which were removed by the defendant to Skipton, and in lieu of which nothing had been offered to the plaintiffs.—His Honour gave a verdict for the plaintiffs for £5, and directed that the timbers of the roof should be handed over to them.

Important to Joiners.—At Scarborough Police-court, on Wednesday week, Samuel Pexton, master joiner, was summoned by Robert Pickering, under the Employers and Workmens Act, for refusing to pay him 8s.—viz., 2s. for three hours' work and 6s. in lieu of nine hours' notice, according to the custom of the trade in Scarborough. Mr. Hick appeared for the complainant and Mr. Crowther for the defendant. Mr. Hick, in opening the case, quoted from the rules of the Joiners' Society, but Mr. Crowther objected, saying that Mr. Hick was at liberty to quote the usages of the trade, but not the rules framed by men for their own guidance. Mr. Hick then stated that one of the usages of the trade was nine hours' notice to be given on either side, which, in the present case, had not been complied with. The defence was that complainant was dismissed for neglect of work and idleness; defendant said he was not a member of the association, and did not know of the nine hours' notice usage. After hearing evidence as to the custom, the magistrates allowed the claim, 8s., with costs, 6s.

Singular Relation between Architect and Contractor.—At Shaftesbury County-court on Tuesday, before Mr. Lefroy, the case of Soppitt *v.* Swaffield was heard. Mr. Nodden appeared for plaintiff, Mr. Atkinson for defendant. Mr. Nodden said it was an action on an acceptance given by defendant. In 1876, defendant was employed by a Captain Greaves to erect a house near Bridport, plaintiff being the architect. Defendant was hardly up to his work, and plaintiff being put to trouble and inconvenience in consequence was promised £50, which was to have been paid when defendant received the amount due to him. He paid £25 and repeatedly promised to pay the balance, but eventually gave an acceptance. When he wanted to renew the bill plaintiff issued execution against him, and defendant then made an affidavit denying that he owed the money, and declaring that the acceptance was obtained by fraud and misrepresentation. Mr. Atkinson said defendant had given the cheque and bill by mistake, and having understood from Captain Greaves that he ought not to have done so, he now disputed the whole account, and brought a counter action for damages by seizure of houses and for scandal.—Plaintiff, Mr. James Soppitt, was then called, and said he was an architect and surveyor, of Shaftesbury. Defendant was engaged by Captain Greaves to erect a building, of which he was architect. The claim was for duties performed independent of those as architect, and for tracings. He pledged his own name in order that defendant might carry out the works, and recommended him to timber and cement merchants. The defendant's tender was the lowest, and was accepted; but owing to his ignorance of concrete building the arrangements which ought to have been made by the builder the architect had to carry through. After the work was over he received a letter from the defendant offering voluntary payment for his services; £50 was agreed upon, and he received £25.—Cross-examined: He had made a claim against Captain Greaves for £37, a moiety of his travelling expenses during the erection of the building. Had received a goose as a present from defendant.—His Honour: It surely is not usual for the plaintiff to pay the architect?—Plaintiff: It was his agreement. The building cost £2,700, and he had received £120 from Captain Greaves and £68 from defendant—£13 for quantities and the £25.—Defendant being put in the box confirmed the last statement, and said he asked plaintiff for a valuation of the extras, and he sent a letter saying that a sum of £153 was due, of which £50 was his. He had since ascertained from Captain Greaves that the sum was not due to plaintiff. It appeared that Captain Greaves was unable to attend, and his Honour gave a verdict for defendant, with costs. Mr. Nodden remarked that it was not a question as to the claim so much as it was that plaintiff felt his character was at stake, and his Honour replied that there was not the slightest imputation on plaintiff's character or honesty.

CHIPS.

The annual exhibition of the works of students in the Lewes School of Art was held at the school on Tuesday and Wednesday in last week. The *Sussex Advertiser* states that there was a decided improvement in the quality of the specimens as compared with former years, and that the number of exhibits in oil was larger than on any previous occasion.

A meeting of the Sanitary Institute of North Wales was held at Chester, on Thursday in last week. Amongst the matters discussed were the overcrowding of houses and how to prevent this, and the occupation of those unfit for habitation; the necessity of careful inspection of new dwellings, and the importance of having all sanitary requirements complied with before a certificate for the house to be inhabited is granted; and the mode of construction of pigsties so as to secure proper sanitary conditions, and the distances within which they may be permitted to adjoin a house.

The U.S. National Museum at Washington is approaching completion. It is square on plan, with towers at the angles, and occupies an area of 100,000 square feet.

A meeting of the Viscount Gough Statue Committee was held in Dublin on Saturday, to decide as to the site of the equestrian statue, the Government having offered one in Phœnix Park, of which, indeed, the contractor for erection is in actual possession, and the Dublin Corporation one in the centre of the great thoroughfare of Upper Sackville-street. The former site was generally considered the most suitable from an artistic point of view, but several members said the latter was more prominent, and wished rather to accept the offer of the civic authority than that of the Government. Eventually a majority of the committee decided in favour of the park site.

The Queen's prizes and certificates gained by the successful students in the school of science and art at Ashford, Kent, were distributed on Wednesday week, by Sir H. J. Tufton, at Whitfield-hall, Ashford.

Boam Bridge, Clanfield, has been rebuilt by Mr. Charles Petler, of Burford, at a cost of £235, from the plans of the county surveyor of Oxfordshire. The contract for repairing Radcot New Bridge from the same surveyor's plans has been taken by Messrs. Bartlett, of Witney, of £125.

The county magistrates concerned last week authorised the Committee of Visitors to the Joint Counties Lunatic Asylum, Abergavenny, to choose and instruct an architect to supply plans for the accommodation of 250 additional patients at the asylum.

The local board of Southend-on-Sea last week raised the salary of their surveyor, Mr. Harrington, by £50 a year.

The church of St. George, Fordington, near Dorchester, was reopened after restoration on Sunday week. The church has been repewed throughout with open seats of red deal, with perforated panelled upright framings in nave, and seats of similar design of pitch-pine in the chancel. A new floor has been laid down, and there is also a new reading-desk, of oak. Mr. Chapman, of Dorchester, was the architect, and Mr. Grey, of Poole, the contractor. The cost was £267.

The present Record Office and Muniment Room at the County Court offices, Carlisle, being considered insufficient for the due preservation of the county documents, a new Record Office is being built at the same court from the plans of Mr. J. A. Cory, the county surveyor. At the Quarter Session for Cumberland, Messrs. Richard S. Ferguson, F.S.A., of Carlisle, Wm. Jackson, F.S.A., of St. Bees, and T. H. Hodgson, the Clerk of the Peace, were appointed, under the Lord Lieutenant's precept, a committee to examine, rearrange, and report upon all the county documents, and to remove the same to the new offices when they shall be ready.

Messrs. Salmon, Barnes, and Co. have fitted up the Hull Bank, and are about to fit the new Halifax Bank (Messrs. W. and R. Mawson, architects) with their curvilinear iron bank shutters, worked by their patent balance weight motion.

Our Office Table.

Owing to the alteration of premises, the session of the Architectural Association will not commence until Friday, November 21st, when the president will deliver his address to the members. The conversazione will take place on Friday, December 5th, the cards of invitation for which will be sent out shortly. The library will be open as usual on Friday, October 31st. The first meeting of the classes will be held on Friday, November 28th, the syllabus of which may shortly be obtained from the secretaries of the respective classes.

Mr. Augustus Frederick Livesay, architect, of Portsmouth, recently died at his residence, Sandrock Spring, near Ventnor, Isle of Wight, of apoplexy, in his 72nd year. His father was the late John Livesay, Professor of Mathematics and Drawing at the Royal Naval College, Portsmouth. The younger Livesay was articled to Mr. James Adams, architect, who had himself been a pupil of Sir John Soane. His education under Mr. Adams and his natural taste combined to give him a predilection for Classic architecture, which in its various styles he chiefly practised afterwards, though several of his churches in the southern counties are successful Gothic designs of the Early English period. His reputation as an estimating surveyor was great, and he prepared the estimates for the new fortifications, barracks, and other extensive Government buildings in the south-western district and the Channel Islands. Mr. Livesay also did much useful work for Ventnor. He projected the railway from Ryde, and about 30 years ago established, as a private speculation, gasworks and waterworks for supplying the town. Mr. Livesay was elected a Fellow of the Royal Institute of British Architects in 1866.

At a late meeting of the Philadelphia Engineering Club, Mr. Rudolph Hering exhibited models of connections to be used in joining house drains to sewers. These connections are terra-cotta blocks, sixteen inches long by twelve inches wide, having a projecting pipe into which the drain from the house fits. The projection from the block is at an angle of 45 degrees with the axis of the sewer, in order that there may be no checking of the flow when the drainage from the house enters. In the case of pipe sewers, a section of pipe is made with the connection. These blocks are built into the sewers at intervals corresponding with the width of the house lots on the street, and are made of different shapes in order to fit any position, though the usual place is at the springing line of the arch. Mr. Hering spoke at length on the change which has taken place in the last hundred years in the formula for determining the velocity of flow of water in pipes; and showed that, as new conditions entered into the problem, the accepted formula would be superseded by one which met those conditions, until "Kutter's formula" was evolved by combining the others, all of which had been correct for the conditions of the experiments on which they had been established.

At Cairo, so it is said, there is a wooden statue of an old man that is curiously like Mr. John Bright. "There is an intense reality about him, as he stands on his pedestal at Boolak, with his head thrown back with an air of dignity in keeping with the staff of office he holds in his hand, and his comely face and eloquent lips ready to tell of the days before the Flood." If the face illustrates the mind and takes its expression from the habits of life and thought, it may be argued that the Egyptian represented by the statue must have been some great "tribune of the people," who, like Mr. Bright, succeeded in gaining office without trying for it. The discovery certainly inspires a wish that more Egyptians of this stamp had been alive now.

The Treasury has, we regret to hear, definitely decided not to ask Parliament for the cost of fitting-up the new Natural History Museum at South Kensington and for the removal of the Natural History Department of the British Museum thereto till 1881. This is another instance of the new-born zeal of the Government for cutting down the estimates. The sum involved in this case, compared with the public advantage to be gained by its expenditure, is worthy of being classed with the recent attack upon the soldiers' widows and orphans employed at the Royal Army Clothing Stores in Pimlico.

The new buildings at South Kensington will be ready for occupation in a few months. Everyone knows that the magnificent collection of natural history objects now lying scattered about the British Museum is deteriorating for want of proper housing. Yet these beautiful specimens of nature must continue to be kicked about the old sheds in Bloomsbury for two or three years more in order to lighten the Budget of a few thousand pounds, while millions are being added to it for the hunting and slaying of Zulus and Afghans.

The Wigan Junction Railway, the first sod of which was cut in October, 1876, was formally opened last week for mineral traffic. The line opens out an extensive portion of the Wigan coalfield. The collieries, in what is known as the Wigan districts, raise annually from 10 to 12 million tons of coal, and it was thought by those interested in the trade that additional railway accommodation was desirable; hence the formation of the company. Parliamentary powers were obtained authorising the construction of the line from Wigan to Glazebrook Junction, thus affording access to the Midland system. The entire length of the line is 11 miles; but up to the present only eight miles have been completed —viz., from Glazebrook to the Lancashire Union Railway, near Strangeway's-hall Collieries, Hindley. The London and North-Western and Lancashire and Yorkshire Railway Companies have had the entire monopoly of the traffic. Since the line was commenced, an arrangement has been made by the Wigan Junction Railway Company and the Manchester, Sheffield, and Lincoln Company for the working of the line by the latter company, on terms considered to be advantageous to both.

In his inaugural address to the Society of Medical Officers of Health, Dr. J. S. Bristowe, the president for 1879-80, dwelt on the progress which has been made of late years in the preventive branch of medicine. While he confessed himself sceptical of the treatment of many diseases by specific remedies, he believed that a grand future was opening to expectant remedies, *i.e.*, those which would remove or diminish the causes of disease. In a graphic review, he carried his hearers through the whole range of pathology and nosology, showing that if not the origins, at least the modes of checking almost every disorder of the human frame are now known. Goitre had been shown to be caused by drinking water impregnated with vegetable matters, and was banished by giving purer supplies to the inhabitants of mountainous districts; ague, rheumatism, bronchial affections, could all be prevented by sub-drainage, and the present condition of South London, formerly marshy and unhealthy, was an example of what could be done. Cholera and enteric fever were communicated solely by the contamination of uncooked vegetable food, water, or diluted milk with the excretions of those already suffering from the specific poisons of these diseases. He predicted that the advance of sanitary science would greatly diminish these and other causes of disease, and at the least show us how, if known precautions were adopted by communities, man's life could be prolonged more generally to the normal limit.

At Gresham College, Basinghall-street, Dr. Symes Thompson is delivering a series of lectures on "Physics," and in his opening one dealt with the subject of the air and water supplied to London houses. Treating of the air supplied to our houses, he said that Nature had provided a variety of means by which they could escape the evils of stagnant air. As to the influence of smoke, which was very great—as they who dwelt in London knew but too well—an Act of Parliament had been passed to prevent manufacturers from polluting the air with their smoke; but it was very imperfectly carried out. Smoke always increased fog; and, now that London contained several millions of inhabitants, and covered such a vast area, if all its houses and factories were allowed to send forth into the atmosphere an unmitigated and undiminished quantity of smoke, the fogs would become more enduring and destructive. Formerly they spoke of November fogs, but they seemed now to last from October or November to April, and, in fact, it was difficult to say when they began and ended. Another great evil, especially in a city like London, was that the air, on account of the height of the houses, was unable to reach the surface, in spite of its wonderful property of diffusion. One very efficient way of escaping from all this was by migrating to the suburbs, which was already largely done, and it was the duty of all medical men to encourage it. The City was no longer the home of the citizens, and it would be a desirable thing if it were less the home of those who worked in it. There was room for considerable improvements as to the air inside our houses, the purity of which was frequently vitiated to an extent little dreamt of by the general public through the defective systems of house drainage very widely adopted at the present day.

"St. Luke" is the title of a new journal devoted to the interests of Religion, Medicine, and Art. The first number is stronger in the last than the first two subjects. A very readable article is contributed by Mr. "John P. Siddons (Seddon ?) on "Architecture, its Decoration by Architects or others." In a footnote we observe the author agrees with us that "the only practical conclusion come to by the Committee for the Decoration of St. Paul's—viz., to commence by covering the great dome with mosaic, is a most deplorable one. This dome is the one part that is decorated now by Thornhill's paintings, which at least give scale, mystery, and distance, and have a really beautiful and tender effect, and to obliterate these is worse than sheer waste of money. Let the committee try their 'prentice hands' on one or more of the small flat domes over the chancel, which cry out for decoration, and whence their experiments can easily be expunged if they do not prove satisfactory." "Curiosities of English Ecclesiology" is a compilation of some interest by Mr. Lewis Andre.

Early in the present year the proprietors of *Little Folks* Magazine instituted a children's prize competition for coloured copies of the "Little Folks' Painting Book," the prominent feature of the scheme being that all the books were eventually to be distributed among the Children's Hospitals, as a Christmas present from the young artists. In response to the invitation thus offered to the readers of *Little Folks*, hands and brains have been very busy for six months past, and during the closing days of the competition the number of books received by the editor has averaged as many as 500 copies a day, thus bringing up to many thousands the total number of painting books received. As a result, then, thousands of beautifully coloured books—more interesting than scrap-books, as the pictures are accompanied by amusing letterpress—will be available for distribution among the children's hospitals.

The third of the series of science lectures given in connection with the Gilchrist Trust, under the auspices of the Exeter Literary Society, was delivered at Exeter on Monday week by Dr. Carpenter, the subject being "A Piece of Limestone." Dr. Carpenter, in commencing his lecture, said limestone, in all its various forms, was really the produce of animal life. Marble was nothing but ordinary limestone in a purer form, and there was really no distinction between marble and ordinary limestone, except that the former was capable of taking a polish. The Babbacombe marbles, the marbles of Clifton and other places, were all simply limestone in a state of more or less change from their original character. There were other stones which were really limestones, though they might not be generally known as such—for instance, Bath stone, Portland stone, and Caen stone, and there were also limestones of the lias formation which formed the cliffs seen at Axminster and in Yorkshire, these latter containing more clay than the others. All these limestones had the same chemical composition, and were formed of carbonate of lime. The lecturer next proceeded to explain the chemical properties of limestone, and the process of its formation, pointing out that if they looked at the sea they saw limestone being formed in vast quantities. The lecturer next proceeded to explain that marbles, originally the product of animal life, had become hardened and changed by volcanic and other action, until all the traces of life had been obliterated by the crumbling and pressure which had taken place in certain portions of the earth's crust. All modern limestone was undoubtedly formed of organic remains, and he wished them to understand the reasons which led them to believe that the old limestones were of similar formation. By means of numerous illustrations of shells and forms found in limestone, the lecturer showed how this stone was formed in the past; and illustrations of the discoveries made during the voyage of the *Challenger* showed conclusively the formation of limestone going on at present at the bottom of the sea.

The official duties comprised within the salary of the county surveyor formed the subject of a long and lively discussion at the Wilts Michaelmas Sessions on Tuesday week, the ball being set rolling by Mr. G. L. Lopes, who protested against the existing system of gratuities under which a vote had just been passed in favour of Mr. Weaver, as an addition to his standing salary as county surveyor of £270 per annum, for services rendered in connection with the carrying out of new works. He moved that the general superintendence of the construction of the new wing lately added to the County Lunatic Asylum should have come within the scope of such duties, without any additional remuneration, unless under a special direction of the Court. In the course of the debate that ensued Mr. A. Meek warmly defended the course pursued by the asylum committee, and contended that the expenditure in the shape of gratuities to Mr. Weaver was considerably less than the commissions formerly paid to advising architects. Mr. G. Goldney supported the proposition, and said the time had come when repeated applications should cease to be made to the Court. The salary and duties of the county surveyor should be defined once and for all. If that official had had fresh duties imposed on him he had been relieved of others through the prison and militia stores having been taken over by the Government. The chairman (Mr. R. L. Lopes), in putting the motion, said he could not conceive of anything more improper than the uncertain and uneven system of payment by gratuities. In a somewhat altered form Mr. Lopes' motion was carried unanimously, the following rider being appended: "And in the opinion of this Court the system of payment by gratuities is inexpedient, though sanctioned by precedent. That it be referred to the finance committee to consider and report what changes, if any, shall be made in the standing orders of the Court, as defining the duties and emoluments of the surveyor."

An assessor and jury were occupied for two days last week, at St. George's Hall, Liverpool, in considering the value of certain land and premises in Key-street, Liverpool (the property of the executors of the late James Hodgson), required by the Lancashire and Yorkshire Railway Company, in connection with improvements and extension of Tithebarn-street Station. The area is 1,098 square yards, and the following were the valuations made by gentlemen on behalf of the railway company:—Mr. Shelmerdine, £10,640; Mr. J. A. Picton, £10,863; Mr. W. H. Picton, £10,866; Mr. W. H. Weightman, £10,867; and Mr. Elias Dorning of Manchester, £10,872. The valuations for the owners were as follows:—Mr. Cornelius Sherlock, £19,973; Mr. Edmund Kirby, £20,250; and Mr. Wainwright, £21,212. Mr. Kirby produced plans of a large block of offices, designed by him, to be built on one of the sites, twelve years ago. The jury ultimately assessed the value of property at £18,637. Mr. James, instructed by Messrs. Grundy and Co., of Manchester, appeared for the railway company, and Mr. Gully, Q.C., and Mr. Leresche, instructed by Messrs. Broadbent, Heelis, and Broadbent, of Bolton, for the owners. By the award of the jury the claimants have also the power of disposing of the two spirit licenses attached to the property, worth upwards of £1,500.

A curious legal omission as to building matters has arisen at Liverpool, and is arousing a good deal of comment. It is stated that the builders of some of the numerous small houses in the neighbourhood of Everton have been extensively using a mortar composed of a small quantity of lime mixed with street-sweepings, the latter being largely made up of manure. This material is used for plastering the inside walls of houses. Dr. Taylor, the Medical Officer of Health, has announced that under the existing law he has no power to put a stop to this practice, as no nuisance is actually experienced at present; but he adds that a nuisance will arise very soon after the mixture has been plastered on walls, and that then he will take legal measures to repress the evil.

Within the last week or two there has passed away another relic of the London of the days of

Elizabeth, the residence on the western side of Aldersgate, commonly known as "Shakespeare's house." The local tradition—which has no foundation in fact—goes that William Shakespeare lived in it when he was proprietor of the theatre in Golden-lane, towards the close of the 15th century. In Shakespeare's time the house bore the sign of the "Half Moon," to which sundry inscriptions and hieroglyphics in the old woodwork referred. A writer in the *City Press* in 1866 describes the house as well able to "vie with any other house in the City for its elaborate carvings in wood and primitive panelling, well worthy of the attention of those curious in such matters." As a proof of its age he mentions that during some recent repairs there was found under the woodwork a coin of the date of 1596. Half a century or more later, the aristocratic and literary wits of the "Merry Monarch's" Court were accustomed, we are told, to assemble at the "Half Moon" tavern, opposite to Lauderdale-house, which, as is well known, stood on the east side of the street. "Shakespeare's house," however, with its heavy projecting gables and quaint oriels and bow windows, is now a thing of the past, and a large pile of modern buildings is about to be erected on its site.

A large iron pier has just been erected off Coney Island. The pier is 1,000ft. in length, extending outward from high-water mark. Its width is 50ft., with enlargements of 100ft. in width at the shore end, the centre and the pier-head. It is double-decked, with iron substructure, the whole supported by wrought-iron tubular piles, 9in. in diameter, made of ½-in. metal. These piles are arranged in rows, at distances of 20ft. longitudinally and 16ft. 8in. laterally. Each pile has at its base, a circular cast-iron disc, 2½ft. in diameter, which when sunk into the sand, acts as a supporting base, and at the depth of 15ft. or 20ft. insures a perfect foundation. The piles were driven by the "jet water" system. Iron capitals were bolted to the tops of the piles, and they supported 15in. wrought-iron beams, bolted together, upon which the superstructure rests. The structure is made more secure by being braced throughout with diagonal rods 1½in. in diameter, and heavy horizontal struts bolted to the beams transversely. The entire structure is supported by 260 iron pillars.

The difficulty of bringing trains up steep inclines where the ordinary locomotive is insufficient, is sometimes overcome by providing a central rail to be seized by suitable apparatus on the locomotive, or by force of traction through a cable wound round a drum rotated at one end of the incline. M. Agudio is the author of an ingenious system which seems to occupy a middle position between the two just referred to. The motor apparatus is a fixed engine exerting traction through a cable, but the cable, instead of being attached to the train directly, acts on it through the pulleys of a special apparatus called a locomotor, which, in some measure, fills a *rôle* similar to that of the ordinary locomotive, for it serves to regulate the motion, and it exerts an adherence on the rails which may be added to the motor force. In this system the speed of translation of the cable may be amplified in any ratio to that of the train, and there is a corresponding reduction in the strain, permitting of reduction in the section and weight of the cable. M. Agudio has applied his system successfully at Dusino, on the line from Turin to Genoa, and it is proposed to adopt it on the approaches to the St. Gothard tunnel and elsewhere.

Mr. Samuel Jones writes respecting the Tolmer's-square Industrial Exhibition, which we reviewed last week. In our notice we omitted to say that the excellent painted porcelain plates, numbered 37 in the catalogue, were the work of Mr. Jones, who also exhibits some stained glass. Our remark referring to another work of that artist, No. 22, had reference to the head of a girl; in other respects the design is meritorious. We may remind Mr. Jones and others that it is practically impossible to notice all of the exhibits at such an exhibition, even if they were worth attention; and we have simply confined our remarks to those works which appeared to call for special notice. With reference to Mr. W. F. Jenkins' carved panel for a sideboard, which we mentioned, the number quoted from the catalogue should have been 61—not 60.

Lamplough's Pyretic Saline is Refreshing, most agreeable, and the preventive of Fevers, Biliousness, smallpox, skin diseases, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[Advt.]

Holloway's Ointment is not only fitted for healing sores, wounds, and relieving external ailments, but rubbed upon the abdomen, it acts as a derivative, and thus displays the utmost salutary influence over stomachic disooders, derangements of the liver, irregularities of the bowels, and other intestine inconveniences which mar man's comfort.—[Advt.]

CHIPS.

The Severn Bridge was opened on Friday, when Sir D. Gooch reported that the headings of the Severn Tunnel, which are being driven from opposite shores, would meet in a few days, and that within a few days he would be able to take any gentleman through the tunnel. These expectations of a speedy completion have been disappointed, for the works were suddenly interrupted on Saturday by the tapping of a spring which flooded the Monmouthshire heading, and its shaft. Extensive pumping-engines are being erected, but it is feared that the resumption of the work will be delayed for several months, and 200 workmen are thrown out of employ.

The autumn exhibition of pictures at the Manchester Royal Institution was thrown open on Sunday afternoon, from two to five, free of charge. During the three hours about 4,500 persons passed the turnstiles, and the visitors, chiefly of the working classes, were very orderly.

The foundation-stone of a Working Men's Club and Institute was held at Chatham on Saturday. The building is situate close to High-street and the Military-road, and will consist of lecture-hall, library, reading, billiard, and smoking-rooms, hot and cold water baths, and refreshment bar. The estimated cost is £2,000.

A new concert-hall in Warrior-square, St. Leonards-on-Sea, was opened on Tuesday last. It occupies the former site of the skating-rink. The principal room measures 57ft. by 96ft., and the cost of erection has been £10,500. We have illustrated the chief elevation.

The statue of the Earl of Northbrook, which has been erected at Calcutta by public subscriptions, was unveiled on Sept. 22, by Sir Stewart Bazley. It is a full-sized figure in bronze, and is mounted on a marble pedestal, bearing on each face a medallion, upon which an inscription is inscribed in English, or one of three vernaculars. Mr. Boehm was the sculptor.

A school-house and parsonage have just been completed in the village of Poulton, midway between Farfield and Cirencester. The architect was Mr. Butterfield.

The Congregational Chapel at Andover has just been reopened, after enlargement, at a cost of nearly £600. An apse has been added in which is an organ with decorated case, and in the front of this a rostrum has taken the place of the pulpit. Six class-rooms and infants' room have also been added to the schools.

The Baptist chapel in Cemetery-road, Sheffield, has just been reopened after renovation and improvement.

Opening services were held on Tuesday week in the new Baptist church, Hale-road, Bowdon. The building, which has been erected from the designs and under the superintendence of Mr. W. Owen, will seat nearly 500 persons, and its total cost will be £2,500. Under the church proper are schools, and the whole erection is in the Italian style of architecture.

A United Free Methodist chapel, seated for 140 persons, is stated by a local paper to have been built at a cost of £180 only, in the village of Morton, near York, and has just been opened.

The final arrangements for the purchase of the local waterworks by the town council of Margate, were completed on Tuesday week.

The Church of England portion of the new cemetery at Tyldesley, near Bolton, was consecrated by the Bishop of Manchester on Monday week. Mr. R. Knill Freeman is the architect of the buildings in the grounds.

It is proposed to apply, in next session of Parliament, for powers to make a tramway in the Lea Bridge-road, from the existing system of the North Metropolitan Tramways Company in Clapton-road to the Rising Sun in the first-named road. Mr. W. F. F. Ashdown is the engineer of the scheme.

"An Antiquary," writing to an Essex journal, expresses his deep regret that the Abbey Lands at Barking passed last week under the hammer and were sold in lots for building purposes. He offers £5 towards a subscription for repurchasing them for the public, and so preserving the venerable buildings and walls on the site, which he says has been known by its present name for 1,250 years.

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Trade News.

WAGES MOVEMENTS.

Crieff.—The Crieff masons, after being ten days out on strike, resumed work last week at a reduction of ½d. per hour.

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THE BUILDING NEWS

LONDON, FRIDAY, OCTOBER 31, 1879.

THE INSTITUTE OF ART.

SINCE our last notice of this exhibition of art-work by ladies, considerable progress has been made, and we have now the pleasure of drawing attention to another display just opened at the galleries in Conduit-street, W. The Institute of Art, as we have before remarked, is established for the purpose of promoting amongst ladies a taste for art workmanship, and for providing facilities for the exhibition and sale of handiwork. Prizes of money are awarded by the council twice in the year for the best exhibit in each of the several classes, provided there be not less than ten competitors (members in each class), and certificates of honourable mention are awarded to other exhibits that the committee think deserving. A subscription of five shillings quarterly, or one pound yearly, entitles ladies and gentlemen to free exhibition of four works of art at each exhibition; but they can exhibit any larger number by a small additional fee per article, and are entitled, in respect of the latter, to compete for prizes. Winners of prizes and certificates are further eligible for election as "fellows" and "associates," at which election they are relieved from payment of subscription. We need hardly say the Institution already gives promise of a useful and prosperous career, and much of its success has been due to the exertions of the Secretary, Commander Oswald B. Niven, late R. N., and others who have worked with him. We can here only glance in a very hasty manner at a few of the classes of objects. Oil and water-colour painting head the list of classes, and in both branches we see some creditable work that far surpasses the work of last year. The prize is awarded to Miss S. Beale, for a river scene, with boats, and we think the judges have made a wise decision. The willows and sedge growing along the river's edge are painted spiritedly, and the handling indicates an adept with the brush. Above, we notice a small coast scene, also painted with some vigour. Honourable mention has been bestowed upon several others. We particularly note an oil study of "Our Baby," dressed in white frock with sash and cap, signed S. Beale. The face represents a little chubby, rosy girl, and the sketch is vigorously handled. An Italian girl is the subject of another piece similarly honoured. The "Wreath of Roses on White Marble" is a delicate and well-painted conception of decorative character, by "W. N." A large painting, showing a cool stream and herds, by R. C. Saunders, has also been singled out for mention. If we may be allowed to remark, there are a few pieces left in the shade that seem to have deserved equally this distinction. "In the Spring Time of the Year," by F. J. Ellis, is a winter landscape, with leafless trees, cleverly executed. Mrs. Lush's "Rhododendrons" is well-drawn, and the colours are harmoniously blended; Miss J. R. Reynolds' "Sunflowers," and her "Garden Poppies," are both admirable oil studies; Mrs. Cecil Holmes' "Old Houses, Rotterdam," is rich in its tones, and the "Rocky Chasm," by Miss R. C. Saunders, the "Mantua Makers," by E. Turck, "Richmond Park," by Alice Green, are also artistic works, deserving recognition. Mrs. Lush's "Roses," and "Ixias in Japanese Vase," by Mrs. Ronniger are, on the other hand, crude, and loud in colouring. A few clever sketches, not in competition, are exhibited. On the screen we notice a few clever sketches in oil by Miss S. Beale, showing scenes from Venice, &c.

In the water-colours the prize this year falls to a group, "Armour," by Miss E. J. Jackson. We are not altogether pleased with the composition; the helmet and other steel armour is not happy in grouping; but, notwithstanding these defects, the drawing of the ivory relief goblet, and the colouring, are masterly. The same artist receives honourable mention for a small vase with chrysanthemums, a rich bit of colour, and drawn with masterly precision and feeling. Another piece, "Azaleas," is also clever. Miss H. S. Tatham sends one or two creditable sketches. A waterfall at Bettws-y-Coed is broadly handled, and well receives the "honourable mention." "Old Houses at Nuremberg," by E. Turck, is also distinguished, and deservingly so. "On the Common, Tunbridge Wells," is a clever bit of foliage. "An Interior," Abbott's Hospital, Guildford, by Miss G. Beauchamp, is a good subject, handled with some skill. "An Architectural Landscape," G. S. Hollis, is picturesque. On the screen we observe some coloured engravings, after Rowlandson, quaint and humorous subjects. We note among other creditable works Miss R. J. Biddle's "Fresh Breezes," Mrs. Dalison's clever landscape sketch, Miss Riddell's "Mount Vesuvius," Miss M. Gibson's "Mountain Stream," Miss T. E. Markwick's "North Coast of Cornwall," and Miss Tatham's "Quiet Corner in Old Churchyard." Lady Dunbar is this year represented by a few works evincing much labour, though not faultless. The water is intensely blue, and the buildings are spoilt by the want of verticality in the lines. "On the Reviera," "The Palace of Monaco," "Port of Cannes, France," are all painstaking. Miss Whitelaw's drawing of "Old Porch, Offchurch" is also rather shaky in the lines, but the colouring is good. We also call attention to Mrs. Lush's "Poor Man's Feast," a few herrings cleverly drawn, and H. Knapping's "Chinese Study." In the class of paintings on china, we observe a few commendable works, evincing correct taste in design and colour. Particular merit is due to Miss Dunlop for a salmon-coloured plate with wild rose, and the plaques in black frames, painted with delicate flowers, are also noticeable for the harmony of colour and design displayed. We notice, also, two cake-plates, one with a fine yellow flower or star pattern on a rich brown ground, and another of a bolder pattern. The photographic views of Tintern, on porcelain, are interesting, so are the representations of Old London on china, in frames. Honourable mentions are awarded to Mrs. Nesbitt, Miss Slade, and Miss Shoesmith.

In the class of modelling there are a few noteworthy specimens. The best work we saw was a study or model of "Little Fidget," by Gertrude Crockford; the head and features are spirited in conception, and quite artistic in execution. Specimens of ink drawing and etching, as Mrs. Stonor's cards of "Alice in Wonderland," are to be seen, and show that pen-and-ink may be used decoratively, as in such things as cards, fans, and other fabrics.

Embroidery and needlework appear, however, to be the predominant class of exhibits, as, indeed, we might expect in an exhibition of ladies' work, and in this department the "Institute of Art" bids fair to become an important means of culture. It is quite evident that both in design and in the choice of colours, considerable improvement is manifest since last year, for we see fewer examples of tawdry workmanship. Miss Elliott Scrivenor, whose chair-back in crewel-work carries the prize, also exhibits some very tasteful crewel work and silk embroidery; we notice especially a plastron and cuffs, in a blue merino, with a design upon it of green leaves and white flowers; some Holbein embroidery in washing silks for curtains, the pattern a neat blue check. Miss Scott sends a tea-table cover, a chairback on gold sheeting, with a border of a square pattern. The same lady's crewel work of pleasing design, a "tea cosy" on green twill material; Miss Nightingale's front of dress, worked in black satin, embroidered in wool and silk, with foliage and flowers; Miss Blanc's child's dress and an embroidered crêpe scarf, executed at the Ladies' Embroidery Establishment, Somerset-street, W., enriched by folial pattern in brown and yellow silk on white material; Mrs. Collier's and Mrs. and Mrs. Coke's work are all admirable specimens of embroidered work. A rich green-stuff valance with sunflower pattern, by Miss Scott, and a rich piano front, by Mrs. Henry Jones, with classical figures worked on a rich citron yellow in harmonious colours, call for special remark in this class of work; as also another of black stuff, with a pattern of peacock's feathers, the colours of the raised needlework being rich green and blue. Miss Agnes L. Tracey exhibits a handsomely-worked screen, the design of which has a Japanese *motif*. The flowers, lilies and poppies, are worked in wool on a twill cloth of light neutral green, and the contrast of colour is excellent. A point lace and silk-embroidered curtain with insertion, by Miss Scrivenor, claims attention for the quiet cream-colour satinet ground, worked in silk scroll-work. As a specimen of old embroidery, Mrs. Percy Smith's fancy or stage dress front, copied from a design of the Renaissance period in South Kensington Museum, calls for special notice. The ground is a light buff-coloured sarcenet, and the embroidery is worked in gold, green, and other coloured silks, enriched by rubies, topazes, and other stones, the design being thoroughly conventional, and partaking of the stiff metal-like forms we find in the old vestments. The same lady sends medallion in frame, representing Cecilia; the ground is of rich blue stuff, the figure being worked in gold thread; it is from a picture dated 1479, the design and colours with circles of gold thread forming a kind of nimbus, are excellent. The chairback, on a rich citron twill or satinet, with storks and foliage conventionally arranged, by Miss Oldham; and Mrs. Tapson's mantelshelf border, from a design by Mr. West Neve, on a dark bluish-green fabric, are also praiseworthy for the design and harmony of colouring.

In the class of lace, several beautiful specimens of handiwork are upon the tables, rivalling in beauty the "point" and "pillow" laces of Honiton and Brussels. Old Italian point lace has been well imitated in No. 44, several specimens. Guipure lace, in which the patterns and flowers stand out in relief from the ground, is shown by a beautifully-worked specimen by another lady. No. 202 is a finely-worked handkerchief, and Miss Scott, in 305, contributes an excellent work. The prize in this class is awarded for a point-lace apron-border of bold design, by Mrs. Malinda Hoge, while Mrs. W. Hanlon receives honourable mention for some rich lace trimming.

The judges include Mr. Ludovichi, Mr. W. Niven, Mr. H. J. Middleton, and Captain Wündt, whose names are a sufficient guarantee for the performance of the task committed to them.

Among other articles of interest, we notice a design for a dado by Miss Isabel Tracey, in outline, and some clever water-colour sketches by Mrs. Stonor. Designs for work, tapestry, old needlework, china plate, carving, &c., are other classes included in the present exhibition, and we can confidently assert that if the standard of taste and merit, which has already shown such decided advancement, continues to improve, the Institute of Art will soon take its place among the most encouraging and instructive of art institutions.

THE ALTERATIONS AT THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE alterations that have been carried out at the Institute rooms in Conduit-street are upon a far more moderate scale than those contemplated in the scheme prepared by Mr. Phipps. For the reasons we gave when remarking upon that design, we consider the plan that has been carried out by Mr. Anderson a more sensible one under present circumstances. It does not entail a large expenditure for what after all would have been a piecemeal scheme; it retains the meeting-room at the old level, it does not disturb the library arrangement, but increases its facilities, while one of the main objects of the alteration—the better ventilation and lighting of the meeting-room, and improved accommodation and approaches—have been secured. Those interested in the present changes, and who know the old staircase approach to the meeting-room, will be glad to hear that, in the place of the old and crowded cloak-room on the first landing, reached by awkward steps, which occasionally was so full that few except the biggest "fellows" could get relieved of their hats, umbrellas, and mackintoshes, a spacious vestibule has been made, in the rear of which is a clerk's office, and that the second flight of the main stairs has been considerably widened, so that there will now be little risk of undue detention and crushing, even when a paper or programme of more than ordinary interest draws a few extra visitors to the meetings. Landing on the first-floor, the meeting-room entrance remains where it was; but we find that the room itself has undergone transformation. The flat, low ceiling, with its depressing ventilator and gas-burners, has been removed, and a domical lantern has been formed a little on one side. The scaffolding at present erected prevents a satisfactory idea from being formed of the effect of the treatment; we observe, however, that pilasters are being formed on each side that will cut off a narrow bay at the entrance side. These will carry a ceiling-beam, and the intention of this division is doubtless to make the dome a central feature of the main ceiling. The dome, flat in section, is supported upon wrought-iron girders, which have been introduced to support it and the superincumbent walls, and springs from flat segments forming pendentives. These and the flat-arched spaces are enriched by relievo ornament in Jackson's composition, the character of which evidently partakes of the Adams style. The centre of each pendentive is pierced for ornament or ventilation. The interior of the dome is panelled, and is intended to be relieved by colour. The beams or architraves have the usual channel and medallion enrichment, and the flat parts of ceiling are adorned by panels with scroll-work and festooning of the period we have referred to. The dome is crowned by a lantern, and round it is a perforated space or chamber, which communicates at four points with large zinc branch tubes, which connect with vertical tubes in the angles of the surrounding buildings which inclose the lead flat above. The vertical tubes have large cowls, and it is intended to produce an up-current in them. Square zinc tubes are also placed at the floor-level for fresh-air admission. We understand Mr. Verity's system of ventilation is being carried out; but, whatever plan is adopted, we hope, for the good name of the professional head-quarters in the metropolis, it will be a standing success, and worthy of the sanitary skill of the council who for years past have sat and held their meetings in one of the worst ventilated rooms in London. We observe that new bookcases are to be placed round the walls of the meeting-room, and these will be fitted in arched recesses, thus relieving the library of its surplusage. Thus altered, the meeting-room will be made available to members for reading. The library and council-chamber retain their old positions, and are not to be altered, except as regards a few fittings. On the second-floor, round the domical lantern, new rooms have been built; these are supported on the girders we have mentioned, and will be used for storage purposes, &c. The water-closets and lavatories have also been shifted into more commodious and better ventilated apartments, removing another reproach levelled at the insanitary condition of the Institute's own premises. The room used by the Association has not undergone any alteration except that the entrance has been improved by the addition of a fan-light over the doorway which the increased height of the new stairs to the institute rooms has afforded. The fittings and decorations are not sufficiently advanced to enable one to judge of the effect, but we trust as regards the ceiling decoration, the council will exercise a discretion and taste responsive to the expectations of the artistic world out of doors. There are many members of the Institute who would form a committee well able to undertake the task of arranging the decorative fittings and details, and we hope officialism will not prevail to the extent of letting these matters remain in the hands of those who, however competent they may be practically, are not pre-eminent for taste or art culture. The works have been carried out from the designs and under the supervision of Mr. J. Macvicar Anderson, the successor of the late Mr. Burns, of Stratton-street, W.

THE SANITARY CONGRESS AT CROYDON.

[SECOND NOTICE.]

THE Sanitary Congress at Croydon was brought to a close last Saturday, and as we have given full reports of the several sections and the papers read, we shall here confine our attention to a few of the more salient topics that have occupied the attention of the conference during the week. Captain Douglas Galton, in his address as president of the Engineering and Sanitary Construction Section, travelled over most important ground, which was subsequently well covered in other papers. Captain Galton certainly made out a strong case for the urgency of establishing courses of systematic education in sanitary science for architects and others engaged in sanitary construction. He showed, upon the clearest evidence it was possible to adduce, that the engineer and architect have in their hands, if they rightly understand the means, the power of arresting disease and producing important changes in the immediate surroundings of a locality; they can modify the condition and temperature of a soil, they may control atmospheric damp, they can arrange for the rapid removal of rainfall, and may, in a word, materially modify the incidence of disease, as many works in the north-western provinces of our Indian possessions, in Algeria, and other places prove. We thoroughly endorse the opinion that sanitary improvement in this country would have reached a higher level if Government had not dictated the measures to pursue, if there had been less red tape, and if the Legislature had confined itself to the enactment of laws requiring sanitary defects to be removed, and the establishment of schools and other means for infusing a knowledge of sanitary science. It must be admitted that our sanitary progress has been extremely tentative; it has been essentially based on empirical knowledge; and only very recently have we come to look upon sanitary science as embracing far more than a knowledge of drainage and water-supply. Pure air and water, though two main elements, do not make up the conditions required for the maintenance of health; various facts of physical science enter into the question, chiefly hydrogeological, geographical, and meteorological; and to understand sanitary principles it is necessary that all these data should be observed and systematised. With regard to climate and the water-level as they affect a site, sanitarians have only just begun to take cognisance of these conditions, and the incidence of disease has been found chiefly to depend upon them. Then, again, the value of free currents of air in our towns, the amount of ozone, and the means of analysing the air of different localities in towns, hygrometric conditions and other matters brought forward in Mr. G. J. Symons' able paper, have all to be studied before sanitary *science* can be said to exist at all. But Captain Galton's paper touched the architect's province even more closely than it did the engineer's, for, as he indicated, although water-supply and drainage are important matters, they do not come into contact with the most vital functions of life, but belong to the outworks, so to speak, of the subject. How to obtain pure air in a building is, we think, of far more importance to health than the subject of sewer-ventilation out of doors, however much the two are correlated. We have, further, to maintain a temperature in-doors different from that out-of-doors. Captain Galton shows that theoretical calculations on ventilation do not give us all that we require; many data cannot be brought into the calculation. On these points we refer our readers to our report of Captain Galton's paper. The materials of our houses, their porosity, modes of heating, &c., are all details bearing upon health in the house, but we refer to this address more particularly because it indicates the extent of the subject of sanitation, and how closely it concerns those who undertake the duty of designing and building our houses, and watching over the health of towns. We are glad to find the Sanitary Institute propose to organise a course of practical lectures on the subject during the winter. The final suggestion of Captain Galton will, we feel convinced, receive the sanction of all intelligent members of the profession. It is that surveyors to local boards and corporations should possess a certificate of competence from some qualified educational institution. As the author said, important questions of drainage and ventilation have in many instances been committed to persons of good general architectural or engineering knowledge, but who had not any special training in sanitary matters. The detail of plumbing-work, for instance, is a practical branch of sanitary knowledge that has been much neglected, but which requires special attention both from the architect, who often shirks the matter, and the workman who has been employed, as trifling defects may militate seriously against a generally good design. Mr. W. Eassie's paper on "Bad Plumbing" dwelt upon various common defects, such as imperfect jointing of soil-pipes, and we refer the reader to our summary published last week. The "slip-joint," without solder, was instanced as a cause of ill-health and death, while other defects were the patching-up of worn-out soil-pipes corroded by gas, or the connection of soil and rainwater-pipes, and sink-wastes with drains, the use of pan-closets and D-traps—all abominations which the architect has strangely overlooked. Mr. Eassie's complaints were directed against abuses well known to the architect; but, unfortunately, till the profession insist upon specifying and seeing performed the improvements suggested, plumbers will go on their own way. What could be worse than pan-closets and D-traps? Yet these things may be seen specified over and over again. As regards imperfect joints, we are not so sure that they have been an unmitigated source of nuisance; their very imperfection has rather been a benefit than a curse before the disconnection of the house-drain with sewer was contemplated. The fallacy of air-tight sewers was exploded years ago, and air-tight house-drains have been similar sources of mischief. Earthenware, as a material, has also to find favour with the plumbing craft, which, like all crafts, is slow to discard the traditions of the workshop. That various opinions still exist as regards matters of practical importance, the papers of Mr. J. Bailey Denton, C.E., and Prof. Corfield testified. Mr. Denton drew attention, for instance, to the vexed question whether surface-water should be excluded from sewers, and whether sewers should be made water-tight, and hinted at the value of appointing a commission under Government sanction, which should decide positively upon these and similar questions. There is now sometimes a dangerous hesitation among engineers upon such matters, and local authorities are afraid to act expeditiously on account of the disagreement that prevails. Dr. Corfield's paper on fallacies, was devoted mainly to exposing many mistaken ideas and arguments in sanitary matters. To argue against the water-carriage system because it had led to so many abuses, or to imagine that by filtering water the germs of disease could be removed, were fallacies that had led to many absurd statements, and the same was the case with regard to air-tight drains.

Last Saturday, a visit was paid by the members of Congress to the North Surrey Schools, Anerley, a builing certainly possessing more interest from a sanitary than an architectural point of view. Of the school itself, little need be said. It is an extensive building of three stories of red brick, with white brick in the quoins and window-dressings, and arranged with a centre and two end wings, which inclose the exercise yards for the girls and boys respectively. The infirmary, which was first inspected, is a detached building on one side, and is now, owing to the sanitary efficiency of the establishment, half devoted to dormitories, the mortality having been reduced to the small number of 3 per 1,000. Entering the building in the centre, the visitors inspected the day-room on the left side. This contained about 14 beds, ranged on both sides, with windows for cross ventilation, and contained only one patient in bed, and a few children with ring-worm. Passing through this, another similar ward was entered. Both are heated by stoves. Next the exercise ground for infants and the school were inspected; the Kindergarten system of instruction is that used. The dining-hall forms the central rear block of the main schools, dividing the boys' and girls' exercise grounds, and above the hall is a spacious chapel. The kitchen and domestic offices are upon the same central axis in the rear. Round the courtyards, which are asphalted, covered ways project, and the w.c.'s, &c., also project at the back. The soil-pipes are external and ventilated. In the wards and schoolrooms, the fresh air is admitted at the skirting level by air bricks, and the vitiated air is carried away by similar openings at the top of room.

It was, however, the efficiency of the sanitary arrangements and the training of the children that elicited the chief praise from the members present. The gymnastic facilities for the boys, their mast and dumb-bell exercises, and their swimming, and the girls' musical drill gratified the visitors, and were the themes of well well-merited praise. We cannot omit mention of the spacious and well-fitted lavatories at the rear of the exercise-grounds supplied with hot and cold water from pipes which run along open troughs, and by which means the water can be made either hot or warm by turning cocks at one end of the lavatory. The afternoon's visit was concluded by some remarks addressed to those present by Mr. Edwin Chadwick, the father of modern sanitation, from whom we learn that the training and education carried on have only cost £1 per child per annum. Mr. Chadwick related the steps taken to secure the healthy condition of the schools at Norwood and Anerley; how an improved dietary, supplemented by improved ventilation, cleanliness, ablutions, and physical exercise generally paved the way for a reduction of the death-rate, and for the success that has attended the training of these schools. One important feature was the half school-time principle introduced by Mr. Chadwick, which allowed opportunities for drill and for industrial exercises. The few admirable specimens of skill by the boys and girls exhibited in the course of the visit were ample testimony to the value of this principle. Separate beds are also provided for each child. The results observed point to the value of the factors enumerated by Mr. Chadwick. While the first five years of the institution showed a mean death-rate of 5·8, the mean of the last five years the rate has been reduced to 3·4 per 1,000. The mean of the cases of sickness in the infirmary for the first period is stated at 180 per 1,000, and for the last five years only 43·8 per 1,000. These figures alone bear ample evidence to the value of the system of sanitation sketched by Mr. Chadwick, but an equally important result of the system is the additional fact recorded that the children are found in self-supporting industries, while hereditary pauperism and criminality are nearly extinguished at a cost of less than £1 per head per annum.

Last week we glanced at the exhibition, which will be kept open a few days longer. We now refer to a few other exhibits of interest to the profession. In the class of ventilators, we may remark the simplicity of Ellison's conical openings for a variety of purposes. By the conical opening, Mr. Ellison obtains a current of air that diffuses itself directly it enters the room either through the skirting or otherwise. The conical perforated skirting we saw seems to us the most successful mode of introducing cold air, and for large halls or rooms the space can be warmed by hot-water pipes, thus effectually fulfilling two offices at the same time. The method of extraction by deflecting plates, so as to secure a vacuum or an induced upward current in the flue or pipe, has been cleverly worked out by Mr. Jas. Hamilton, of Rochdale, who shows some very suitably shaped outlets. We specially notice the plain and double deflectors, the "double current" deflectors, ridge ventilators, and crosses, all of simple form, and well adapted to buildings of any style. The deflecting plates are all fixed at an angle of 45°. For the sides of roofs, and also for ridges, Kite's "dormer ventilator," with valves and balance weights, allowing the current to be regulated or stopped entirely, is another excellent plan.

In the class of stoves and heat producers, we must call attention to a few exhibits. Gillingham's radiating heat-generator for gas or lamp is an ingenious arrangement of pipes. It consists of three or more vertical, and one horizontal connecting tube, in the former of which are placed lamps. The heat ascends and fills the tubes, and is perfectly utilised without waste. Mr. Gillingham's galvanised-iron heat-radiators are well suited for warming conservatories, halls, and rooms, and the principle is decidedly economical, as one carbon Argand gas-burner, or one Duplex lamp will heat a room of good size. We must not omit to mention Mr. H. Saxon Snell's thermhydric ventilating hot-water open fire-grate, of which there are specimens at the show. It consists of an ordinary fire-grate surrounded on all sides but the front by chambers with coils containing water, which, being heated, circulates through the pipes placed in the side chambers. Thus, the objection to close heated iron stoves is obviated, and the open fire retained. For hospital wards, the invention is decidedly a desirable one. An inlet for fresh air is obtained below the grate opening from the outer wall, and this air as it enters passes behind the hot-water chamber and becomes warm. The stove is incased, and forms a large oblong-shaped piece of furniture. The Sun Lighting and Heating Company, Southwark-street, exhibit what they call a "sun auto-pneumatic gas machine," the main feature of which is that gasoline is used. The machine is cylindrical in form, and is automatic in action, and can be made to produce and distribute gas automatically. For mansions, churches, and other buildings beyond the reach of gas-mains, the gasoline machine appears to be excellently adapted. We also saw in operation an automatic street gas-lamp (Hearson's patent), which makes gas. The reservoir is fixed above the upper part of lamp on the outside, and is filled with benzoline. We have already mentioned the "Stott" self-acting gas governor, exhibited by Mr. J. Sinclair, of Leadenhall-street, and may simply add, the principle of the invention is that of an inverted glass cup, which plays in an annular trough filled with quicksilver. Any undue pressure of gas acts on the glass, and presses it up, closing a valve at the same time attached to a centre spindle, and thus regulating the supply to the burners. We saw the action of the regulator upon a few gaslights, and the effect was to create a steady flame, and a decided saving as recorded by the meter.

Water-waste preventers are largely represented. In addition to those already mentioned, we may allude to Martin's patent water-waste preventer, exhibited by Messrs. Hayward, Tyler and Co., of Upper Whitecross-street, which appears to fulfil its purpose. Messrs. G. H. Flood and Co., of Blackfriars, also send some waste-preventers and high-pressure valves. Dodd's ventilated w.c., is an exceedingly effective and simple apparatus; the ventilator relieves the trap of gas, the outlet is not offensively before the eye, and the facilities for fixing are good. Morrell's self-acting cinder-sifting ash-closets are also to be seen, and may be specified with advantage in country houses and cottages. It turns to account all the cinders, and produces a ready-made manure. The screener is ingeniously contrived, and the closet can be easily adapted to any situation where ashes are at hand. We notice some good sanitary appliances of Mr. Henry Owen, of Sussex-place, S.W., consisting of trapped w.c.'s, gullies, "waste not" supply cisterns, and gully and fat trap.

THE SUNDAY ART EXHIBITION.

A TEMPORARY exhibition of pictures is to be opened on Sunday next at the Aldersgate Gallery of Paintings, Hamsell-street, Jewin-street, E.C., between the hours of two and five in the afternoon, and we have much pleasure in calling the attention of the classes for whom these exhibitions are instituted to the fact. The Sunday Society has been in existence some years, its laudable object being to promote the intellectual and moral improvement of those whose occupations preclude them during the six working days of the week from visiting museums, galleries of art, and other sources of instruction. The present exhibition in the Aldersgate Gallery is the fifth collection brought together through the exertions of the society; and we can say, from an examination of the pictures displayed on the walls, that the committee have spared no trouble or expense in making each exhibition a greater success than its predecessor. The collection consists of many very fine works by the old Italian and Flemish masters, not the least attractive feature being in connection with them the fine carved frames in which they are placed. On the ground-floor devoted to the exhibition we find several works by Raffaele, Tintóretto, the Caracci, Guido, Salvator Rosa, Correggio, and other illustrious names of the *cinque centisti*. Historical pictures and subject-painting are chiefly conspicuous. We may call especial attention to No. 11, "Bethsheba watched by King David," in which the drawing and foreshortening of the king's head are excellent. The "Magdalen," by Guido Reni, is wonderful for the fine and pathetic expression of the face, so characteristic of this great disciple of the Caracci. The pallor of the countenance is wonderfully painted. The picture is surrounded also by a fine carved frame. No. 58 is a Vandyke, and represents the Ecce Homo. The figure of the soldier putting the broken reed into the Saviour's hands, and the general colouring, are striking. We note also a fine painting by Raffaele (No. 57), "Magdalen at Christ's Feet." No. 17, said to be a Rubens, is certainly a fine painting, and exhibits the inaccuracy of drawing and great body of colouring that distinguish that great painter's compositions. Tintoretto's "Christ's First Appearance in the Garden of Gethsemane" (No. 19), is a boldly-conceived work, with strong chiaroscuro and free colouring. "David with the Head of Goliath" (No. 8), by Correggio, is a grand composition, both in colour and light and shadow. We can only mention No. 31, a finely-painted head, Nos. 34, 55, and a fine painting by Cartoria, of the Ascension of the Virgin. In the upper rooms several fine subjects by Rothwell, Zucchero, West, Opie, are to be seen. We have only space here to refer more particularly to a fine portrait, No. 82, Nos. 85, 76, a fine portrait of Shakespeare, No. 65, a grand work by Opie, full of depth and dramatic power. No. 122 we notice more for the splendid carved oak frame with which it is surrounded than the picture itself, which is oval. The carved scrollwork and the figures are boldly and massively executed in oak, and the design is an exceedingly good example of 16th-century workmanship. In the top room we notice a few grand subjects by A. Carracci, Raffaele, P. Delgada, &c., which for composition, grouping, modelling, and colour are not to be surpassed. No. 123 is a delicately-painted Virgin and Child; the Head of Herodias is vigorously painted, and particularly fine in colour, in No. 124; and Nos. 145, 111, are also splendid specimens of art conception. We are only sorry to find these pictures are located in rooms which scarcely befit their value as works of art. The light in many instances is bad, though this difficulty may be overcome by a little rearrangement. We are sure that all lovers of painting will be amply repaid by a visit to Hamsell-street Gallery. The pictures have been lent by a connoisseur who has evidently brought together works fit for any national gallery, and the Sunday Society are to be congratulated on their good fortune in having so fine a collection of the old masters placed at their disposal. We understand on Sunday next the Rev. Wm. Rogers, Rector of Bishopsgate, will deliver an opening address in the gallery.

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We omitted to state in our notice last week of Anderton's Hotel, that the patent steam lift was supplied and fitted by Messrs. Buuuett and Co. (Limited), of 90, Queen-street, Cheapside. This firm have also just completed fitting the roofs of the new abattoirs at Roath, Cardiff, with their patent louvre ventilators.

The result of the inquiry into the complaints made by the Rotherham Corporation of their water supply being contaminated, owing to the neglect of the rural sanitary authority to provide proper drainage, is a communication from the Local Government Board to the rural authority, stating that it is essential that steps should be taken without delay to provide efficient sewerage.

SANITARY CONGRESS AT CROYDON.

[BY OUR OWN REPORTER.]

Concluded from page 488 *in our last issue.*

FRIDAY.

SECTION III.—METEOROLOGY, GEOLOGY, GEOGRAPHY.

THE President of this section, Mr. J. G. Symons, F.R.S., delivered an opening address, in which he pointed out some of the points of contact between the branches of science named in its title and sanitary practice. Meteorology had ascertained for us the range of temperature to which we are liable in this country, but the information thus acquired had been neglected. Who would point to even one house so constructed as to resist, equally well, extremes of heat and of cold? As regards the majority of houses, built solely in order to be sold, it was patent to everyone that this consideration was entirely neglected. The walls were so thin that they allowed the internal temperature in summer to run up to eighty degrees or more, and in winter down far below freezing. There was rarely any outlet for the foul and heated air when it had found its way up the staircases; landlords never thought of providing outside Venetian blinds, and the rooms which faced the sun became veritable heat-traps. Everybody knew that foul and heated air ascended, and yet (owing to the rare adoption of French windows) nineteen-twentieths of all the rooms in England had no outlet within eighteen inches or two feet of the ceiling, where, consequently, there was a permanent stratum of foul and heated air; and, as if with a desire to aggravate this evil, a quantity of gas was burned in the rooms, and the deoxygenised air rose into this stratum and remained there. Perhaps, if it were possible to compel every builder to remain for an hour with his head close to the ceiling of the rooms he built, an alteration would not be long deferred; unless, indeed, the foul air killed them all. In cold seasons it was equally discreditable to hear on all sides complaints of the inconvenience arising from frozen water-pipes, and from their leakage when a thaw follows. If the temperature in England ran down to twenty or thirty degrees below zero, there would be some excuse for such occurrences, but our winters were never so severe. Another case might be mentioned in which a little meteorology would have saved several hundred pounds and much inconvenience. An engineer laid out the waterworks of an inland English town, and either from economy or want of experience, he put his mains only one foot below the ground. He made no inquiries as to the temperature of the soil at that depth. A great frost came: the temperature at one foot went below thirty-two degrees, and so large a proportion of his pipes was burst that it was virtually a case of new mains throughout the town. Another winter accompaniment which has occurred for hundreds of years was always a source of great confusion—a heavy fall of snow. No one seemed to know what was to be done, and the last idea was in many respects the worst. The tramway companies introduced the plan of scattering salt in order to dissolve the snow, and the owners of private houses had imitated them by scattering salt on the pathways in front of their houses. The result was that the pavements are covered with rotten slush of an excessively low temperature, so cold as to lame dogs temporarily when passing over it, as to be injurious even to the well-shod, and almost unbearable to the shoeless wanderer. It would be very little trouble to sweep this soft slush into the gutters, and anyone using salt and not removing the resultant slush should be not only *liable to* a small fine, but should infallibly *be fined*. There was one subject upon which the author spoke somewhat strongly; but which was not exactly meteorological: that of the terrible unhealthiness of our churches, theatres, and other places of public assembly. As regards churches, he would not attempt to apportion the blame between ecclesiastical architects and churchwardens; but he could not understand a preacher looking at the gradual drowsiness spreading over his congregation, and not reflecting that it was quite as much the natural result of poisoning by bad air, as of any lack of interest in his ministrations. The opening of a few ventilators in the roofs of some of our churches would be found to produce, not only more attention on the part of the congregation, but an increase in the amount of the collections. At more than one place of amusement a very rough-and-ready but effective cure for this evil had been adopted by constructing the roof upon a framework which could be rolled off so as to leave the audience roofless for a few minutes; but medical men might consider such a remedy worse than the disease. He did not advocate any mode of ventilation, but would suggest the question, whether it was advisable to trust (as was at present generally done) wholly to the current generated by the difference in the specific gravity of fresh and effete air. There were two reasons for distrusting this mode of insuring ventilation—first, in order to secure its greatest efficiency, the path of the inflowing air must be as free from friction as possible, and freedom from friction was too often co-existent with draughts; secondly, ventilation, depending on differences of temperature, or more strictly upon differences of specific gravity, was evidently least efficient in hot weather—the very time when the general public were most clamorous for an extra supply of pure air. The head of a Glasgow engineering firm had described to him an extremely simple arrangement whereby each successive two minues 200 cubic feet of air were extracted from close to the ceiling of an Edinburgh hall, noiselessly, and without either heat or ice. Moreover, questions of ventilation, both for public buildings and especially for hospitals, were almost wholly determined by means of small air-meters, which are merely delicate anemometers. Take, again, ozone. In spite of all the demonstrations of the inutility and inaccuracy of the old-fashioned ozone test-papers, they were giving us more useful information than we seemed likely to obtain from the more scientific methods which had been declared to be alone of any use. We wanted some rough-and-ready test of the purity and healthiness of the air in different localities, but at present we had none. The old-fashioned ozone test-papers had, doubtless, a multitude of faults—the author had attacked them somewhat vigorously, and Dr. Cornelius Fox still more so; but unfortunately the arrangement which Dr. Fox proposed to substitute was so elaborate, that at the present moment there was not a single place in the British Isles where it was at work. Faith in the old plan had been shattered, and the new one had not been adopted. Next, as to mists and miasma. His hearers, doubtless, remembered the remark of the country doctor, who, walking up a hill, passed from the valley mist into the clear air on the hill-side, and turning to his companion, remarked that that white sheet covered all his best patients. It was to be wished we had statistics of the mortality in some of our old monasteries—Fountains, Tintern, or Rievaulx—for the localities were equally noticeable for their beauty and their mists; and although the regularity of the monastic life might conduce to longevity, such damp localities must have been very ill-adapted for such residents. It was often suggested that our ancestors were stronger than we are, and that, as much of their time was spent in the open air and in hunting, they were less susceptible to the sanitary evils of theis houses and castles. But the monks, even those who were not actually studious, did not lead by any means an equally active, open-air life. Were they, then, able to throw off the effects of damps and mists, or did they fall victims to them without knowing the cause? We, however, with all our nineteenth-century artificial and high-pressure life, knew perfectly well that a "lovely spot embosomed in trees and encircled by hills," was usually characterised by a damp, misty, cold, and stagnant atmosphere. These conditions were not adapted for vigorous health; and yet how many persons rushed blindfold into the arms of the doctor, simply for the sake of a pretty view! Persons generally selected residences, and the sites for new ones, when the weather was fine and the sun shining. There was no reason for their discontinuing the practice; but many selections would be abandoned if the house-hunters would spend an hour or two of the twilight and night in examining the distribution of the mists in the locality. Since few persons spent less than half their time indoors, it was surely not asking very much to urge that an hour or two should be devoted to examining roughly the conditions of the air which would in future surround them for half their lives. Closely connected with the existence of mists was the amount of evaporation,—a subject upon which we were in nearly the same unsatisfactory condition as existed respecting ozone. Some very elaborate, rather costly, and extremely important observatione upon this subject were commenced more than ten years since, and had been conducted under the supervision of Mr. Rogers Field, and we were still waiting for his full report on the subject, but it was now understood that all the old forms of evaporator were useless, and no new pattern had been introduced in their place. Two points of contact between evaporation data and sanitary work were—(1), that the former would be serviceable in computing the yield of storage reservoirs, a point upon which no information was published, and not much existed; (2), and it would be very useful in connection with sewage irrigation, a process which ought to be most successful where the air absorbed the largest amount of surplus moisture. The kindred subject of hygrometry ought to come home to many, especially at a period when people seemed so prone to forsake old and comfortable houses for new and showy ones. Almost before a house was finished, and long before the water necessarily used in its construction had had time to dry out, people rushed in to reside, and then there were rumours of colds, rheumatics, &c., as if anything else could be expected in such a climate as that of the British Isles. Lastly, he came to the rain. This was a most important element in all sewage questions; he said all advisedly, because even where attempts were made to exclude rain-water from the sewers, no one claimed to have suceeded perfectly, and even if he did, the rain question would very likely come in again as affecting the administration of a sewage farm. He would suggest to Mr. Rogers Field that he should try to apply his recent researches upon siphons to the flushing of drains by cumulative discharges of rain-water. The remarkable absence of some classes of disease during the period in 1879 when summer was expected to occur, might have been partly due to low temperature, partly to the absence of the usual supply of unwholesome fruit; but part must also be ascribed to the scouring of the streets and drains by the superabundant rains, and also to the washing of the air. Physical geography was the key to the, as yet, uninvestigated question of the true merits of our various health resorts. The Meteorological Society would very shortly have in operation a system of absolutely identical observations at a considerable number of these health resorts, and not limited to one station—in, for example, Brighton; for would contend that the climate was identical on the racecourse and in Old Steyne? Years ago, Dr. Wigan wrote a little book on "Brighton, and its Three Climates," and the title expressed what probably exists more or less in nearly all our health resorts—and why? Solely because of the variations in the physical features of the locality—Hastings, Torquay, Llandudno, Tunbridge Wells. As to the bearing of geology on sanitary matters, he would only speak to one point, viz., to submit a theory which would probably be regarded at first sight as ridiculous, that a house on a clay soil was not necessarily more unhealthy than one on gravel. One great mistake in house-building, both in town and country, was in grudging a few courses of bricks, and so letting some of the rooms be at, or close to, the level of the soil. In isolated cases floors laid flat on the earth might be tolerably dry, but in the majority of cases they were not, and in no case could such floors be desirable for persons of delicate health; and with reference to the relative merits of clay and of gravel he would submit two facts—(1), the clay under a well-drained house became so dry as to be almost dusty; and (2), although the probabilities were in favour of gravel becoming even drier than clay, yet should any offensive matter get into a bed of gravel, it would circulate more rapidly than in clay. In conclusion Mr. Symons advocated systematic disease registration, and suggested that in the future disease signals would be as useful as storm signals are now.

Dr. Richardson, in putting to the meeting a vote of thanks, proposed by Drs. Haviland and Lory Marsh, to Mr. Symons, said he had made the hygrometric investigation the author had suggested, and had contrived a combined hygrometer, barometer, and ozone-measurer, which was used in some hospital wards. As to our old abbeys, they were very unhealthy to this day; indeed, whatever the virtues of the mediæval monks were, they were wretched sanitarians. He announced that it had been arranged to hold a free sanitary lecture to the working classes of Croydon, at 8 p.m., on November 8th, the closing day of the Sanitary Exhibition; addresses would on that occasion be delivered by himself, Messrs. Galton, Chadwick, De Chaumont, Corfield, Symons and Carpenter.

Mr. Haviland, M.O.H., Northampton, read a paper on "Geology in relation to Sanitary Science," illustrated by a series of specially prepared disease-maps of England. He showed that the pleasant dream of "Salutland," imagined by the President, could not be realised, for the very factor necessary to the perfection of type, viz., health, was the great factor of productiveness, and this very productiveness was the factor of destruction by over-crowding. This vicious circle was abundantly demonstrated by records on the rocks of vast floral and faunal dynasties. He urged the necessity of studying the nature of the soils on which we propose to live—an investigation originally recommended by Hippocrates—in order to ascertain the prevalent diseases and to avoid unhealthy sites. The water and air of a district, in fact the whole climate, should also be understood.

THE QUANTITATIVE ELEMENTS IN HYDROGEOLOGY.

Mr. Joseph Lucas, F.G.S., read the following paper on this subject: The depth of rain falling upon the surface of the earth forms the basis of the whole of our calculations respecting water-supply. Thus, the engineer who has to collect water from a mountain gathering-ground works upon an actual or assumed knowledge of the mean annual rainfall, but more particularly of the lowest recorded mean of any short period of years. A subtraction is made for evaporation, and a further "allowance" provided for absorption by vegetation and porous strata. The area of the catchment basin in square miles being the only thing known with any approach to accuracy, all the other positive results required have, in the first instance, to be calculated from negative elements, and subsequently proved, in the course of years, by actual experience. Now in the above case of surface catchment basins, there are few parts of these islands of which the rainfall is not now known through the twenty years' work of our President, and, thanks to his admirable organisation, the ratepayer has now some assurance that his money will not be thrown away in works that would fail to supply water (as was the case in 1868 with many gathering grounds) just when it was most wanted. It is, nevertheless, neither equitable nor creditable to the country that a few individuals should be put to a permanent expense in providing data for the good of the community at large. Valuable as these rainfall records are for surface gathering grounds, they are in themselves of no use whatever for calculating quantities that may be drawn from subterranean water systems. It is not upon the actual quantity of rain falling that the value of these natural reservoirs depends, but upon the quantity which passes through the soil—*i.e.*, upon the natural percolation. In percolation we have a net balance, after the settlement of all accounts between rainfall, the soil, and evaporation. The hydrogeologist dates his work from percolators, and bases all his calculations ultimately upon percolation. Unfortunately, however, the investigation of this most vital subject is in a very backward state, and more observations are urgently needed. Percolation is, however, a known quantity, and a positive quantity which can be experimentally ascertained for every kind of soil. Given the quantity percolating, or the mean annual percolation, the hydrogeologist has no further calculations to make. He is concerned only with dimensions. The first of these is the area of the hydrogeological gathering ground. One must carefully distinguish between surface catchment basins, rightly so called, since they are defined and bounded by a watershed line or ridge that can be seen, and hydrogeological gathering grounds, which are not basins or catchments, and which do not coincide either with the boundaries of permeable formations or with those of the surface system of dry basins into which these are divided. The hydrogeological gathering ground may be taken as co-extensive with those basins in which the subterranean water systems are found to arrange themselves. These are divided by ridges of water, which can be felt, but not seen, and the area of contribution being known, and the percolation on this area being known, it becomes important to ascertain what is the discharge from the area by surface springs, and the sectional area of variation. The amount of this variation is enormously greater in the inner parts of the same subterranean basin than towards its edges, but the mean variation evidently bears the same direct relation to the mean percolation as the mean height of the water line. Given the mean variation of the basin, excess over this mean indicates contribution from the parts of the basin where the mean variation falls short of the mean of the whole area, with due local qualifications. It is, therefore, most important to take daily observations of the height of the water-line in wells. Now, the whole area of outcrop of each porous stratum is made up of such little basins, each independent of the others as long as they are not artificially disturbed. Clearly, therefore, the first object of the hydrogeologist is to map out the subterranean drainage areas. These show where the percolation on every part of a permeable formation goes to. The knowledge of the positions of these basins is gained by determining the form of the upper surface of the water in the porous stratum. This is done by well-measurements; of which, in fact, this is the principal object, and they are levelled by an indispensable foundation, the 6-inch ordnance map. When the water levels have been thus determined, contours may be drawn by casting a series of sections, taken in all directions through the wells of observation, and passing a curve through all the points of equal altitude, on these at specified intervals of elevation. Altitude is an element of quantity: for each successive contour describes a smaller figure than the one immediately below it, and a larger figure than the one next above it. Here we see that equally with the 6-inch ordnance maps, the 6-inch geological survey map is required as a basis to work upon, for the water contours found by well-measurements do not by themselves inclose a space but terminate abruptly, on meeting those of equal altitude upon the upper surface of the impervious stratum below. A curve passed through these points of intersection marks the upper limit of the water system, or the line of abutment of the plane of the upper surface of the water system against that of the upper surface of the impervious stratum below. The difference in altitude between the water contours and those of the bottom of the containing stratum gives the volume of the stratum occupied by water, while the contour lines themselves, with the "line of abutment," which marks the boundary of the water system, measure the area of water in the stratum above the level of each contour given. Thus, the higher the level the smaller the quantity. If the percolation be known, the possible yield of the area above each contour may easily be found. There is no part of the area of outcrop of a water system in which the apparently insuperable difficulties in the way of calculation of quantity afforded by the elements of uncertainty above mentioned may not be overcome by systematic observations of the daily fluctuations of level herein recommended, and I have constructed a very simple self-registering gauge capable of registering fluctuations to any amount. Now we can take the case of the converging points of a water-system—*i.e.*, the effluent springs. The volume of a spring predicates the area of contribution, assuming the percolation known absolutely as regards the springs flowing out by the base of a water-bearing bed, and approximately (but falling short of the real amount) as regards those issuing from its top. Therefore the daily register of the volume of springs is an element in the quantitative value of each height of the water-line. The mean volume of a spring flowing from the base of a water-bearing bed exceeds the mean quantity that could be drawn from a well in the same basin, unless the well dried the spring up, when the yield of the well would simply be that of the spring. In the case of springs issuing from the top of a bed a well might procure a mean quantity larger than the mean flow of the springs by drying the springs, and pumping part of what naturally descends under the overlying impervious stratum. The springs of Croydon, Beddington, Wallington, and Carshalton are of this class. They are in too great volume for any one well, but it would be possible to pump, from a line of wells in the three miles, a quantity exceeding the mean volume of the springs themselves, or about 20,000,000 gallons a day. As to the appropriation of the springs themselves, that is a wholly different question, and as this question will at no distant future form a subject for the consideration of Londoners, I wonder vested interests have been so long able to withhold some of the finest and best spring water that the world produces—and all ready to its hand—from the great city.

Dr. Carpenter protested against the last suggestion, and said he hoped the inhabitants of this district would be able to resist any endeavours on the part of the Metropolis to tap their water supplies for outside districts.

THE BORINGS AT THAMES HAVEN.

Mr. W. Barns Kinsey gave a description of the artesian well of Thames Haven, which has been carried out to a successful issue, under his supervision as engineer. The boring was carried to a depth of 574ft., and so carefully excluded was the influx of surface water and the brackish springs tapped during the process of boring that the analyses showed a gradually improving quality of water, till the maximum depth was attained. Mr. Grantham, C.E., Prof. Wanklyn, and Mr. Lucas, asked for and obtained from Mr. Kinsey details of the work, which has been referred to more than once previously in our columns.

RAIN-WATER AS A DOMESTIC WATER SUPPLY.

Mr. H. Sowerby Wallis read a paper on "Rain collected from Roofs considered as a Domestic Water Supply." For our water supply we are, he said, entirely dependent upon rain, whatever may be the immediate source. While the average rainfall in the British Isles varies from 20 to nearly 200 inches per annum, according to the character of the district, he had selected as representative stations those with an average of 22, 25, 35, and 45 inches fall per year. The 22 inches is the lowest satisfactory average he knew of obtained from a sufficiently large number of years, and 25 inches represented the fall over a larger part of the country than any other amount. He should deal with the subject more particularly of the supply of labourers' cottages. Taking the average size of these as 15ft. by 20ft. each, with an assumed roof-inclination of 35 deg., the average yield of water for a year, with a mean rainfall of 25 inches, would be 3,900 gallons, or nearly 10·7 gallons per day, but the loss in collecting is considerable. Measurements of the flow of water from a tiled roof in average condition, show about 20 per cent. lost. First, there is the water absorbed by the tiles; then a considerable quantity is held between the tiles by capillarity; and, lastly, some is lost by splashing off the edges of the roof and out of the gutters. On a slated roof, he believed the loss might be reduced to between 5 and 10 per cent. But the supply must be calculated not only from the average rainfall, but from the fall in a dry year. Thus, at a station with a mean annual rainfall of 25 inches, the amount in the driest year is about 17 inches. This would yield 2,546 gallons. Deducting 20 per cent. for loss, 509 gallons, leaves as available supply 2,037 gallons, or rather less than 5·6 gallons per day, which would be altogether inadequate for the use of four or five persons—the presumed number of the inhabitants of the cottage. With a mean rainfall of 30 inches, we should have an average supply of 10·3 gallons per day, and in the driest year 6·9 gallons. With a 35-inch rainfall 12·0 gallons, and 7·7 gallons per diem, with a 40-inch rainfall 14·5 gallons, and 10·8 gallons daily, 45-inch rainfall 16·4 gallons, 13 gallons daily. He had not seen a statement of the requisite quantity of water per head, per day, in rural districts. In towns the quantity varies from about 12 gallons to about 50 gallons; but there can be no fair comparison, as in towns a large proportion goes for trade supply and for general sanitary purposes; a great deal is wasted by bad fittings; and the amount used for waterclosets, which are almost unknown in country cottages, is considerably more than half the quantity delivered to each house. A cottage with an average supply of 12 gallons per day of pure water close to the house, would be considerably better-off than nine-tenths of the English cottages in their present condition; but this could only be obtained from the roof in places where the mean rainfall was thirty-five inches and upwards. In places where the rainfall was less, this method could only be adopted with satisfaction as a supplemental supply, or for potable water where there was another supply for cleansing purposes. It is of considerable importance that the water collected on roofs be properly stored. The best receptacle is an underground tank or well, bricked at the sides and bottom, and lined with about half an inch of Portland cement, to prevent loss from leakage or pollution from the infiltration of impure water from the surrounding ground. The top should be domed over, leaving a man-hole, so that the tank may be occasionally cleaned; and the man-hole should be covered with a slab of paving-stone, laid in mortar. The pipes from the roof to the tank where they pass underground should be of glazed earthenware, and the joints made with cement, so as to be both watertight and impregnable to insects and other polluting matter from the outside. They should not go straight into the tank, but into a small receptacle beside it, in which any dead leaves or other matter carried down from the roof would be intercepted, so as not to reach the tank and decay in the water. This receptacle should be made with a closely-fitting movable cover, so that it could be occasionally cleaned, which would aid materially in keeping the water pure. The tank should also have a waste-pipe to allow surplus water to escape, the end of which should be covered with a piece of perforated zinc or copper-wire gauze, to prevent frogs, mice, or other vermin having access to the water. A tank carefully constructed in this manner will not require cleaning more than once every two or three years. As to the required size of the tank to insure a regular daily supply proportionate to the yearly fall, the tank must be of sufficient capacity to store all the water that falls during the wet periods of the year, for if during the spring some of the heavy rains run to waste, the water kept in store will not be adequate to meet the daily demand during the dry summer weather, for anything deducted from the yearly amount of rain even during the wettest season must of necessity reduce the average daily supply that it is capable of yielding. The requisite capacity of the tank from the surplus yield of water is, therefore, calculated during the three wettest months, and for a cottage 15ft. by 20ft.—the size on which all these calculations are based—with a rainfall of 20 inches the tank would require a capacity of 150 cubic feet, or 5 months' supply; with a rainfall of 25 inches 200 c. ft., or 5 do.; with a rainfall of 35 inches 235 c. ft., or 4 do.; with a rainfall of 45 inches 250 c. ft., or 3 do. The decrease in the proportionate size of the tank with larger rainfalls is due to the different relations which the wet periods in dry districts bear to those periods in wet districts, for at wet stations the fall is more evenly distributed over the year. The cost of tanks such as have been described would not exceed one shilling for each cubic foot of capacity, that is a tank holding 100 cubic feet would cost £5, and so on. When a storage capacity of more than 200 cubic feet is required, it will be found advantageous to make two or more tanks rather than one large one. The inclination of the roof has not much effect on the total storage of water, for though a steep roof would catch rather less water, it would run off more freely, and less would be held between the tiles by capillarity; with a very flat roof the conditions would be reversed. On a slated roof there can be no doubt that the loss would be less, and need not exceed 10 per cent. The most important element is the position and bearing of the house, for if a house has a large expanse of steep roof facing a wet wind, it will, undoubtedly, catch more than the average, especially if it is in an exposed situation. As a general rule, a flat roof will catch most water in a sheltered position, and a steep roof in an exposed position, if it presents a fair proportion of roof to the wet winds.

In inviting discussion on the paper, the President of the Section remarked that this was the first time he had heard of an attempt to tabulate the exact amount of the direct supply from the rain. Miss Amelia Lewis thought the paper deserved earnest attention, for the rural cottager had not at present a sufficient, nor a comparatively clean and potable water supply. The practical point was, who was to provide in the cottage the tanks proposed by Mr. Wallis—the builder, the landlord, or the cottager? If left to the last named it would remain, she feared, as one of the improvements to be accomplished in the "good time coming," of which the President had spoken. Mr. Hill congratulated the author upon having steered across the current of public opinion in this age of delegated authorities. While the Society of Arts, with the Prince of Wales at their head, was agitating for a Royal Commission on a scheme of national water supply, Mr. Wallis had suggested an independent supply to each house. Great care would be needed to prevent pollution of the cottage tank; Hodge's children might throw things into it, and might even be bathed in the tank. Dr. Carpenter said such tanks would be of great value to the poorer dwellers on the hills outside Croydon; in the summer time they were in most cases absolutely without a supply, and had to procure it by cartage, often from ponds and other impure sources, from the valley. Not only did the paper give interesting and useful information to rural landlords and their agents, but it might be pondered over in Croydon, where almost the whole of the rain that fell on the houses of the 70,000 inhabitants passed directly into the sewer without utilisation in its transit. Mr. Baldock corrected some of the errors of Mr. Hill; Mr. Wallis and the Society of Arts were not so opposed to one another as he imagined, for the paper had only referred to supplies for groups of cottages, which would never be provided for under any grand scheme for the whole country. Hodge's children could easily be excluded from the tank, which would be an infinitely better storage-place than the shallow well so common. The President of the Section said, for a century past, and till within the last eighteen months, all experiments on rainfall had been decreased in value by an error, and he was sorry to say it tainted the result of his own investigations, made prior to the correction of the mistake. For more than a hundred years meteorologists had been suggesting theories to account for the supposed fact—originating in observations of rainfall collected on the central lantern of and the ground adjoining Westminster Abbey—that less rain fell on an elevated station—say the roof of a house—than on the ground below. The error was simply due to the failure of the observers' gauges on towers and roofs to catch the rainfall; if made large enough, or if placed on the lee side of the tower, the gauge would register the same as on the ground. The fact had been overlooked that a current of rain-bearing air, on striking a roof or tower surface, rose, carrying with it for a short time the rain which fell elsewhere. To return to the paper, he thought it would be undesirable to attempt to save the water which fell on outbuildings of cottages; instead of that, it would be well to make the tanks larger.

Mr. Corden read a paper on "The Influence of Weather on Disease," which was followed by some discussion by Dr. Carpenter and other medical men.

WATER SUPPLY OF CROYDON.

Mr. Wm. F. Stanley read a paper on this subject, considered in relation to the rainfall and geology of the district, and offered suggestions for the sanitary and profitable improvement of the supply. Mr. Stanley explained that in the autumn of 1875, Croydon was visited with a very violent epidemic of enteric fever of the typhoid class. A Local Government Board inspector visited the town, and made certain recommendations as to the general sanitary conditions, all of which were duly carried out by the local board of health. Public opinion in the district was general that the spread of the epidemic was due to one cause only, contagion conveyed in some manner through the water supply. Cases of enteric fever were confined, or very nearly so, to the area supplied by the Croydon Waterworks, which covers only a part of the entire district. On one side of the Selhurst-road, supplied with the Croydon water, the epidemic prevailed; whereas on the other side, where the houses were supplied by the Lambeth Waterworks, there were no cases. As soon as the cause was discovered, housekeepers took the precaution to boil the water used for drinking purposes, and the epidemic disappeared. With the aid of coloured maps and diagrams, the author detailed the drainage levels and geology of Croydon; the town, he showed, lies just at the point where the outcrop of the chalk deposits meet the London clay, and the whole tertiary series are exposed in the neighbourhood; the waterworks are situated in the town, on the line of a geological fault, and near the bottom of a large valley extending over an area of between six and seven square miles, for which the neighbourhood of these works form the natural drainage outlet into the Wandle. As the supply is pumped directly from the works into the houses, it is a primary matter whether the admission of surface water is sufficiently prevented. He had been informed that to secure this immunity from infiltration, one of the wells was bricked up, and the other lined with iron castings; but the latter might wear into holes, and the joints might not accurately fit; while both brick and cement were porous. Indeed, once completed, neither were tested or guaranteed as watertight, and he urged that the only safe measure would be to provide for the oxidisation of the water by the provision of open reservoirs in which it could be exposed. This would economise engine-power by allowing of storage and regular pumping. He proposed that the reserveirs should be placed somewhere on the London clay to the north of the town, and suggested that if a further supply of artesian water be required it could easily be procured from the greensands to the south.—The paper caused the sharpest discussion of the Congress, many of the townspeople defending the present water supply arrangements as excellent, and resenting the proposal to improve them. Dr. Carpenter reminded Mr. Stanley that the epidemic proper of 1875 was caused by defective sewerage. He admitted, however, there were some cases of typhoid undoubtedly connected with the water supply, but as soon as the cause was known then it was stopped, and the epidemic ceased. Mr. Cooper and Professor Wanklyn testified to the high organic purity, and said there was no necessity for reservoirs. Mr. Kinsey suggested that if the bore-holes were pumped too hard there was a risk of drawing down the surface water and contaminating the well water. Mr. Baldock declared this to be impossible; and said the Croydon water was beautiful, pure, and non-intermittent, and the wells were water-tight. The Chairman (Mr. Symons) thought it would be desirable to provide storage. It was difficult to be absolutely certain about the water-tightness of the wells, and it would be advantageous to test it again. Mr. Stanley, in reply, disclaimed the intention to attack the Croydon water, and sarcastically added that the idea of the epidemic of 1875 having been due to defective sewerage was a kind invention of the scientific men to satisfy peoples' susceptibilities.

THE CLOSING MEETING OF THE CONGRESS

was held at 5 p.m., under the presidency of Dr. Richardson. On the question of the next meeting-place, Dr. Tatham, of Salford, said he was in a position, provisionally, to invite the Congress to that town in 1880, and it was decided, also provisionally, to accept the invitation. The customary votes of thanks to the local committee, the local sections, the Presidents of sections, readers of papers, President of Congress, and the Press were passed in due form and with adequate ceremony.

In the evening a public dinner took place at the Crown Hotel; Dr. Richardson occupied the chair, and the guests numbered about 50.

SATURDAY.

Dr. Richardson presided at a supplementary meeting held to dispose of papers left over from the sections. The first read was one by Dr. Balbernie on "Scientific Quarters for British Soldiers." It was illustrated by plans and sections of barracks. The points brought out in the short conversation that followed were, that it was advisable to keep down the size of barracks, and that central shafts and well-openings were but precarious and unsatisfactory modes of ventilation.

VENTILATION—POSITION OF INLETS AND OUTLETS.

Mr. J. E. Ellison, of Leeds, read a paper bearing this title. The first aim in ventilation is to remove the poisonous products of respiration, then the moisture and organic matter given off from the human frame must also be got rid of, and lastly the products of combustion must be taken away. All these classes of products have one feature in common; they have all been warmed, and are consequently lighter than the atmospheric air we wish to introduce, and which therefore tends to press them upwards. This points out the natural and most economical mode of proceeding. A popular fallacy is that carbonic acid, because a heavy gas, does not rise with the lighter products. True it is heavier, but in accordance with the law of diffusion of gases, having once been mixed with the lighter products, will not readily separate from them, but ascends with them, becoming constantly more diffused. But another class of products must be referred to; the volatile emanations met with in hospital wards, &c., it is still more important should be removed. All thoughtful minds agree that the top of a room is the proper place of the outlet, but there is a wide variance of opinion as to the placing of inlets. In many cases inlets are not provided, the fresh supply being supposed to find its way through the windows or doors, with the result that air comes in at some of the outlets. It is therefore necessary that a similar quantity of air be admitted at a lower level, or of colder air at the same level. The objections to introducing air above the breathing-point are, that the suffusion is not complete; that when the air is admitted near the outlet it is apt to be drawn out at once with the vitiated air, and that incoming air, while becoming diffused with the air of the room, is in reality undergoing a mixing process with the vitiated air. He had been led to the conclusion that air can be admitted, in ordinary cases, at the bottom of the room without inconvenience. During last winter he introduced air directly into a number of rooms by the skirting having cone-shaped openings; these were not supplied with valves, so that in no case were they closed, neither was the air warmed by any apparatus, yet it did not attract attention nor elicit complaint. If the current of air be reduced in its velocity, by being duly regulated, or what is better, by the shape of the openings, which cause it to be quickly diffused, then it can be admitted at a much lower temperature than is otherwise practicable. Further, the air in this position may be readily warmed by hot-water or steam pipes placed in front of the openings, without the dryness felt when it is passed through a chamber.

The President said the question of ventilation without draught was a difficult one. He had found one of the best modes to be to introduce the fresh air very high in the room; the air was warmed, became better diffused, and gave a uniform supply. The only better plan was to admit the external air into the room after warming in a grate; but this could not always be adopted. Most attempts at ventilation failed because no inlets were provided for air, it being expected to pass in through the chinks in doors and sashes, and keyholes, and so it did, causing injurious draught.

INFLUX AND EFFLUX VENTILATION.

Dr. A. Ball read a paper on an improved mode of influx and efflux ventilation, including a portable apparatus for infected rooms. He claimed for his invention that, as modified, it performed many duties, viz., the provision of outer pure air, and incessant extraction of the vitiated-air; the ventilation and disinfection of infected rooms by an appliance fastened by a thumb-screw to the mantleshelf, and by another modification of the contrivance, it introduced into a passage pure air, warmed or moistened in a hot-air chamber, removed the vitiated air, and would also light the hall in the evening. He also showed a special stove with revolving fire-grate, which he stated not only consumed its own smoke, but also removed vitiated air from a room.

CHLORINE AS A DEODORANT AND DISINFECTANT.

Mr. W. Soper, M.R.C.S.E., explained the principle of his hospital drain and portable disinfector, in a paper illustrated with models, and by pungent experiments, the evil odour of which was present with the members of the Congress during the rest of the sitting. The chemical agent he employs is chlorine gas, which he asserted to be by far the best, both on account of its great affinity for hydrogen and on the score of cheapness. Some sulphuretted hydrogen was poured into a vessel in the room, and speedily evidenced its presence by the characteristic rotten-egg odour, and Mr. Soper then neutralised the effluvium by placing in the vessel a smaller one containing chlorate of potash, to which hydrochloric acid had been added. He also explained the sheath he had contrived for encasing gangrenous limbs, by which the horrible emanations distinguishing the disease could be neutralised.

The President said he could testify to the value of Mr. Soper's application of chlorine for deodorisation, as for the past twelve months he had tried it in his laboratory to remove the foul smells arising from experiments with decomposing matter. Professor de Chaumont said it was an efficient deodorant, but as a disinfectant it or any other product of chemistry was simply delusive. The neutralisation of offensive smell was comparatively easy, and for this purpose it was excellent. Disinfection could only be attained by rendering the atmosphere absolutely irrespirable. Troopships on which yellow fever had been prevalent had been treated with this and other disinfectants, with the result of making the air temporarily irrespirable, yet as soon as the ship was commissioned and voyaged to warmer latitudes, the fever again broke out. The President corroborated the necessity for distinguishing between deodorisation and disinfection, and stated that when in Widnes, on the Noxious Vapour Commission of inquiry, he visited in certain neighbourhoods near chlorine works, where the air was to him at first almost irrespirable, cases of scarlet fever whose continuance and speed were in no way checked by the supposed disinfection of the air.

THE PORTER-CLARK WATER-SOFTENING PROCESS.

The concluding paper, by Mr. T. H. Porter, on Prof. Clark's process of softening and purifying water, with a notice of the author's improvements, was ably put before the Congress in an epitomised form by the President. This process is well known to consist in throwing out lime by means of lime, the original mode being to add lime-water to the liquid to be treated, agitating both well, and allowing them to subside in reservoirs; the carbonate of lime held in solution was seized by the lime-water, rendered soluble, and precipitated as chalk. These reservoirs were necessarily large, on account of the time required for precipitation, and thus the process could not for economic reasons be adopted in manufactories, &c., where storage room was restricted. The author's modifications (which were only hinted at, while considerable space was given to descriptions of places where they have been adopted) consist of separation of the chalky product by filtration, so as to allow of the continuous carrying on of the process.

A hearty vote of thanks to Dr. Richardson for his conduct as president concluded the proceedings.

In the afternoon a small party, including the principal members of the Congress, visited the North Surrey District Schools at Anerley, where a few hours were spent in relaxation, the children being seen at play, at gymnastic, and musical exercises. After witnessing swimming exercises in the boys' bath, the members partook of tea in the board-room, while Mr. Edwin Chadwick, C.B., explained how the schools have been brought to their present state of efficiency and healthiness by the adoption of modern sanitary appliances in the building, but more by great personal cleanliness and out-door exercises amongst the children. This visit is treated upon in an editorial column.

EARLY SCOTTISH ECCLESIASTICAL ARCHITECTURE, MANUSCRIPTS, AND BELLS.

MR. JOSEPH ANDERSON delivered the third Rhind lecture of the course on "Scotland in Early Christian Times," at Edinburgh, on Oct. 21. It was devoted principally to an examination of the earliest ecclesiastical remains of Ireland, which necessarily formed a key to the interpretation of the structures in Scotland, as the latter were derived from the former. In the inquiry he laid down three general principles:—(1) That the typical characteristics of a group were most readily obtained from the study and comparison of the greatest possible number of the most perfect specimens; (2) That that number was more likely to be met with in the principal group than in the derived group; (3) That the characteristics thus obtained as typical of the principal group would also be present in the derived group. The earliest churches in Ireland were, we know, constructed within the raths or fortified inclosures of the chiefs who embraced Christianity and took its missionaries under their protection, and this association of the place of worship with its fortified inclosure was continued long after the original necessities for such a mode of construction had passed away. The historical fact must be borne in mind in investigating these buildings that the Early Scottish Church was monastic in constitution, and so the rath which inclosed the place of worship also surrounded the dwellings of the ecclesiastics, and these dwellings, like the rath, were constructed after the ancient native (*i.e.* Pagan) manner. If, therefore, there were found in Scotland a church or churches thus associated with a group of dwellings constructed in the ancient native manner, we were warranted in concluding that a group of Christian remains of an earlier type than this was not likely to be discovered. The lecturer described in detail three groups of ecclesiastical remains in Ireland, those of Skellig Michael, Ardoilean, and Inismuredach, and summarised the leading features of these and similar buildings in Ireland thus:—(1) That they existed as composite groups, comprising one or more churches or oratories placed in association with monastic dwellings, consisting of dry-built cells of beehive shape, and the whole settlement being inclosed within a rampart of uncemented stone. (2) That the churches or oratories found in this association were invariably of small size and rude construction. (3) That, whether they were lime-built with perpendicular walls, or dry-built like the dwellings, they were always rectangular on the ground plan, and single-chambered. (4) They had always a west door, and an east window over the altar. The same forms of huts and churches assembled within a fortified inclosure were to be expected to be found in the derived church-remains of Scotland, and although none so completely typical as the Irish remains could be found, yet there were traces of such structures to be found in Scotland, and as in Ireland they must be looked for on the smaller and more inaccessible islands. Again he would select for description three groups. First was that of Loch Columcile, in Skye, where, although greatly ruined, there could be distinguished a cashel of stone inclosing traces of cells, which had probably been covered with beehive vaulting, as also an oblong building, whose remains were so indistinct that it was impossible to determine its character. Although the buildings might not have been erected in Columba's time, they were apparently of the earliest type, conforming to the Irish typical form, and might therefore be among the very earliest remains of ecclesiastical origin now in Scotland. The second group, that of Eilan Naomh, close to which was a spring called Columba's Well, showed a small church or oratory, associated with beehive cells of uncemented masonry. Passing thirdly to a group at Deerness, they saw a small oblong church with line-built walls, doorways in the west end, window in the east end, and scattered round this the remains of a number of cells. This settlement was protected by a stone cashel; there was a well close by the church, and up to the sixteenth century the place had still a reputation for sanctity. All three groups belonged to the earliest type of Christian architecture in Scotland, delivered from Ireland. But, besides this, there was another class of structures of the earliest type, but not monastic: the isolated oratories such as they saw on Rona, Suleskerry, and the Hannan Isles. There were thus the following phases of advancement exhibited by ecclesiastical structures. First, the rude, unadorned type, consisting of a single chamber, and having but one door and one window, of two varieties—one constructed without cementing material, the other built with mortar. Then the more complete type, consisting of nave and chancel, of which there were found such varieties as that in which the chancel was not bonded into the nave, marking the transition from the single to the double chambered form; that in which there was no chancel arch, the opening into the nave differing in no respect from the doorway; that in which the end of the vault of the chancel roof opened directly into the nave; and that which showed the chancel arch, along with other features which linked it with the architecture of the twelfth century. Again, our earliest churches, while partaking of the structural features of pagan buildings, differed in the important element of angularity and regularity of form, in having a west doorway, an east window, and an altar platform. The type also differed from those forms of Early church structure common in Europe. In Ireland and Scotland the earliest churches were not basilican in form, but were invariably small, oblong buildings, with square ends and high-pitched roofs. No example of an aspidal termination existed; and they were certainly not built after the Roman manner. Their special features were extreme rudeness of construction, extreme simplicity of form, insignificance of dimensions, and total absence of ornament or refinement of detail.

In his fourth Rhind lecture, delivered on Friday, Mr. Anderson described existing manuscripts of the early Celtic Church, and began with an account of the Book of Deer. This remarkable MS. was a small octavo of eighty-six parchment folios, closely written on both sides. The form of the writing was that common to Irish and Anglo-Saxon codices, the letters being an adaptation of Roman characters. Each page showed marks of ruling with a sharp-pointed instrument, and the letters hung from the ruled line instead of resting upon it. The pages were surrounded by ornamental borders, most of which were filled in with interlaced work on panels and fretwork. The matter consisted of portions of the Gospels, fragments of an Office for the Visitation of the Sick, and the Apostles' Creed. The writing of the Gospels was all in one uniform hand, the initial letters of paragraphs designed in fanciful dragonesque forms, and variously coloured. At the end of the book, the same scribe who wrote the Gospels had written a colophon in the ancient Celtic vernacular, identical with the oldest Irish glosses, which were of the 7th and 8th centuries. The language of the Gospels, Office, and Creed was of course Latin, there being, however, one rubric to the Office in Celtic. This book was obviously a MS. belonging to the early Celtic Church and of date not later than the 9th century. Its value and interest were enhanced by the fact that it contained a collection of coloured pictures and ornamental designs contemporary with the writing, executed in the same style, and apparently by the same hand. Then, again, on the margins and vacant spaces of the book were a number of entries in different hands, apparently of the 11th and 12th centuries, being memoranda relating to the territorial possessions of the monastery, made long after the events recorded. They told the circumstances in which Columba founded the monastery of Deer; they gave the names of the clans of the district, showed the division of territory into town lands, detailed their boundaries, and exhibited the different existing rights in them, and the various public burdens to which they were subject. All this information referred to a period when the patriarchal polity, which had grown out of the institutions of the people, had not given way to the feudal system. The records referred also to a period when the ecclesiastical institutions were so far conformed to their original model that territorial jurisdiction, monastic orders, and the hierarchy of ecclesiastical degrees were still unknown, when dedications to St. Peter were a recent innovation, and Columba and Drostan, though five centuries had passed since their removal, were still regarded as the chiefs of the community. Touching next on Dorbene's MS. of "Adamnan's Life of St. Columba"—the writing of which belonged to the beginning of the 8th century, exhibited a total absence of interlacing artistic work, and had its large capitals simply ornamented with daubs of paint and red dotting round the outlines—the lecturer went on to say that had any remains of the original settlement been discoverable on Iona it might have been possible to supplement the meagre outlines of the daily life of the monastery, as presented in Adamnan's incidental allusions. It was to be learned that the settlement was surrounded by a rath, and the site of the monastery must have occupied a considerable space. It was not stated whether the buildings were of stone, but from an incident which happened when the monks were bringing home a boat-load of branches to build dwellings, it was to be inferred that they lived in wattled huts. Their clothing consisted of an upper garment, with a hood, made of coarse woollen stuff of the natural colour, and an under tunic of finer texture, and they wore shoes of hide. Their food was chiefly bread, milk, eggs, and fish, the use of flesh being rather inferred than recorded. Besides attending to daily religious service, they cultivated the farm, put the cows out to pasture, and carried home the milk in leathern vessels and wooden pails; and they had a cart. From the tilled land in harvest-time they carried the corn on their backs, and ground it in querns. They built their own boats, some of which were constructed of planks as transport vessels, and others of wicker-work covered with hides, the latter being sometimes used in long voyages. Indoors the labours of the monks were divided between domestic avocations, reading, meditation, and the practice of writing. They wrote both Latin and Greek characters in a peculiar style, which distinguished the Scotic MS. from all others. They used writing-tablets for taking notes, and they probably made their own parchment and pens, and stitched and bound their own books. Mr. Anderson referred to the Book of Lindisfarn as showing that the art of decoration had reached high perfection before the close of the seventh century. One of the writers of this book was bishop from 698 to 721; and its special interest lay in the fact that although entirely the work of Saxon scribes and artificers, it was produced in a monastery which still bore the impress of Scotic training; that it was one of the very few MSS. whose date was ascertained on evidence not based on considerations of style and character of ornament; and that, while so very early in date, it ranked second in excellence among the MSS. that had survived. The only one that exceeded it in beauty of illumination—namely, the Book of Kells—claimed attention also for the special reason that at a period so early as the eleventh century it was associated with the name of Columba. This book differed from most early Scotic MSS., not only in the excellence of its other illuminations, but in the decorations of the initial letters of sentences. Another peculiarity was the introduction of natural foliage; and this was one indication of its being the product not of the beginning but of the culmination of the school of art it represented. In tracing the progress of interlaced decoration, one found that it died out by the loss of its distinctive character, as it gradually became foliageous, and passed into the scroll work of the late MSS. and sculptured capitals and tombstones. While the lecturer hesitated to claim for this MS. such high antiquity as was implied in its association with Columba, Mr. Westwood, he said, had not the same hesitation. Miss Stokes, on the other hand, pointed out that a comparison of the art of this wonderful book with those dated examples that came nearest to it in character, led to the suggestion that it might belong to the same period as these—that was, the ninth century. But whatever might be the precise date of individual specimens, the fact of importance was, that all the relics in question were of one specific type, a type so clearly characterised by intensity of Celticism as to be recognisable at a glance. The propagandist nature of the Scots, and the character of the training they received explained the Celtic character of the Libri Scotice Scripti to be found scattered over the libraries of Europe. From the quality of the culture disclosed in the relics now discussed, the lecturer said it might be inferred how greatly they should have erred if they had relied on structural remains alone as indications of culture. The men who produced this art, although they might have lived in beehive houses, and worshipped in churches scarcely more refined in appearance or architectural in structure, were not destitute of that varied culture which was literary and artistic in its character. On the contrary, they were men of such acquirements and taste that they multiplied their books laboriously, and counted it a virtue to be diligent in doing so; and the skill they thus required enabled them to produce MS. volumes written with a faultless regularity and precision of character rivalling the best caligraphy of the most literary nations, which they adorned with illuminations of exquisite beauty and intricacy of design, and inclosed in cases enriched with the costliest workmanship in gold and silver, and set with precious stones. Moreover, they saw those men so planting seminaries for the propagation of this culture wherever they went that the vestiges of their culture and results of their intellectual energy and moral power were still perceptible in various forms pervading the existing culture and civilisation.

Mr. Anderson, on Tuesday, in his fifth lecture, began with an account of the buried bell of Birsay, Orkney. This bell, he stated, was found in a cist of large stones. It was rectangular in form; had a handle at the top; the narrower sides being flat, the wider sides bulged. It tapered towards the top, measured 12in. in height and 9 by 7in. across the mouth, and was formed of sheets of hammered iron riveted together. Its shape and character were manifestly those peculiar to the iron and bronze bells of the early Celtic Church, still occasionally found associated with churches standing on the sites of early Celtic foundations. While this bell was the largest but one of the Scotch series, the smallest was also found in Orkney—in the bottom of a ruined tower in North Ronaldshay, along with a large and curious collection of implements, ornaments, and refuse of everyday life, as also a stone bearing the figure of a cross of early Celtic form, and an ox-bone being engraved on it—symbols often found on sculptured memorial-stones of the early Christian time in Scotland. The bell was of thin sheet-iron, riveted up the side, and similar in everything but size to that of Birsay. Its height was only 2¼in., its mouth measuring 2in. by 1in.; and it appeared to have been externally coated with bronze to enhance its appearance and sweeten its sound. It was not smaller than other bells that were known as sacred bells, and it was associated with symbols sufficient to substantiate its claim to be considered a relic of the Celtic Church. Another buried bell was discovered at Kingoldrum, in Forfarshire, being dug up in the churchyard, along with two articles described as a bronze chalice and a glass bowl. The bell was of iron, but had been coated with bronze. It was 9½in. high, and 8in. by 7in. across the mouth. It was impossible to determine with certainty what the other articles might have been; and their loss was all the more to be deplored that nothing answering the description had ever been found in connection with any other remains of the Christian period in Scotland. Both might have really been chalices; and if so, this was the most remarkable discovery of ecclesiastical utensils in Scotland. At the church of Birnie, in Morayshire, there was still preserved an ancient bell. Although it was ascribed by legend, probably with truth. to the first bishop, there was no reason to suppose that the bishop was the first Bishop of Moray, or that he brought the bell from Rome. There were bishops in Moray long before there was a Bishop of Moray, and the bell corresponded in every respect with those of the Celtic Church, which existed five centuries before the see of Moray was established. It was 18in. high, and 6in. by 4in. in the mouth; was made of sheet-iron, and bore traces of having been bronzed. Another bell, which had stood for centuries in the open air in Glenlyon, was 13½in. high, and 8 by 6in. across the mouth. A sacred bell at Fortingall was of the same type as the others, but somewhat oval in form, its dimensions being 9in. high and 7¾ by 6in. across the mouth. Like the Glenlyon bell, its attribution was unknown. The bell of Struan was also of iron, coated with bronze, 11in. high and 7 by 5in. across the mouth. It had an iron tongue fastened by nuts and screws, and was used as the church bell till the late Mr. Macinroy, of Lude, provided a new bell for this purpose, and received the old one in exchange. Its attribution was uncertain. In this series of iron bells there was observable a very strongly-marked type. The peculiar features were, that the material was iron coated with bronze; that they were made by hammering and riveting, and the external coating of bronze produced by a process similar to that now employed in tinning; that their form was very tall, narrow, and tapering, the ends being more or less flattened and the sides bulged; and that they were all portable, their size and weight being such that the largest could be easily swung by hand, for which purpose they were always provided with a handle. They thus differed from the church bells of cast metal of the circular type which had been in use from the twelfth century to the present day. No other type of bell was known to have existed; and as this quadrangular type plainly belonged to a period prior to the twelfth century, it was thus the earliest type of bell in Scotland. Proceeding to inquire whether this group of bells was a principal or a derived group, Mr. Anderson said that in Ireland the type was well known and the examples abundant, from fifty to sixty being enumerated. In Wales, which had intimate relations with the early Church of Ireland, six or seven such bells were known, but in England only two had been found, in France two, and in Switzerland one. It followed that the type was Celtic, and that the principal group had its home in Ireland. But there was to be met with in Scotland another sort of bell of the same type, though of different material. This variety was of bronze, cast in the same form, but with finer lines, and usually with some moulding round the lip, and some artistic finish about the handle. Of these was the bell of St. Fillan, an elegant casting of bronze, 12in. high and 9in. wide, with ends flat, sides bulging, and the handle terminating where it joined the bell in dragonesque heads—a style of ornamentation, so far as known in this country, only belonging to the Christian time. The other bronze bells still remaining in Scotland, he went on to say, were only two in number. One at the church of Insh was in shape not unlike the bell of St. Fillan, its dimensions being 10in. high and 9 by 7in. across the mouth; and this, he thought, might probably be attributed to St. Adamnan. The other was that of St. Finnan, still preserved at Eilan Finnan, Loch Shiel. It was difficult to arrive at definite conclusions regarding the relative ages of the bronze and iron bells. It might be that the iron variety was the older, as it was the ruder, and it might be that the cast bell of bronze and the riveted bell of iron were both in use at the same time, and in the very earliest ages, because there was reason to believe that both varieties might have been used in Ireland before the mission of St. Columba. Touching next on enshrined bells, Mr. Anderson described a remarkable specimen now in the Museum of the Royal Irish Academy, narrating how it was given up at his death by a schoolmaster named Mulholland, in whose family it had been an heirloom. As Scotch examples of enshrining, he cited a small bell of hammered iron found in the parish of Kilmichael, Glassary, Argyle, and one preserved at Guthrie, in Forfarshire. The case of the former was of brass, and showed floriated and zoomorphic decorations. The engraved ornaments presented a series of waving foliageous scrolls, and the ribbon work of an earlier time was replaced by a species of fret-work, all these indications pointing to the conclusion that the work was of the transition period, and not far removed from the beginning of the twelfth century. The bell, however, must have been of considerable antiquity before it was enshrined. In the case of the Guthrie bell, the decoration of the shrine, which was of brass, consisted of silver work and niello, with traces of gilding and remains of the setting of precious stones, there being at the bottom an inscription apparently of the fourteenth century. Reference was afterwards made to the bells of St. Kentigern, St. Trenan, St. Medan, St. Kessog, and St. Lolan, as relics of whose existence in former times there was distinct evidence, the lecturer expressing the hope that a wider knowledge of the interest attaching to them might bring to light those which might be extant.

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PICTURES AND THEIR PAINTERS.

On Wednesday evening Mr. J. T. Bunce delivered at the rooms of the Royal Society of Artists, Birmingham, the first of three lectures on "Pictures and their Painters." The lecturer commenced by suggesting that those who were disposed to think lightly of painters should take a glance at the long and brilliant array of those great painters of the past who, in their several ways, had helped to make the world richer, brighter, and happier by their work. That work was so infinitely varied that from the loftiest flights of creative genius down to the humblest methods of decoration there was nothing beyond the painter's range. Modern pictures, however, were meant not so much for public enjoyment as for private possession. Compelled very much by climate, our tastes were largely in the direction of warmth and snugness; hence the apartments in our English houses were generally very small, and consequently pictures—for the most part—must be of moderate size. A few of the English painters had tried to escape from the limitations imposed upon them, but they were chiefly men who mistook size for grandeur. The result of this compulsory submission to the conditions of English circumstances and English taste was the formation of a distinctly English school, the works of which were (so to speak) domestic in character, moderate in dimension, homely in aim, suitable to the decoration of comfortable dwellings, and not fitted to the adornment of great buildings, national or ecclesiastical. In the department of historical painting we were very poor; but in landscape, with Turner always in our mind, we might justly claim supremacy. Our qualities were freshness, truthfulness to nature, humour without coarseness, fine glimpses of true poetry, and an ineffable and indefinable charm of homeliness. The lecturer went on to speak of popular misconceptions of the artist's life and work—the idea that a successful artist was a man who achieved great results with little effort; and the false and ungenerous notion that artists, more than other men, were careless and untrustworthy. The latter idea no doubt arose from a fundamental belief that no man could be quite respectable, or trustworthy, or ranked with ordinary God-fearing people, unless he had what the law called "visible means of subsistence." The other mistake Mr. Bunce dealt with by describing the toilsome nature of the artist's training, and the long-continued and unremitting attention he was bound to devote to his work. The painter was always at school, and some of the greatest amongst artists confessed that they had much to learn, even at the end of their long and arduous careers. The lecturer added that occasionally artists died rich, but whoever gave up his whole soul and life to the study and practice of art must put aside the hope of substantial gain.

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CHIPS.

The Wigan Junction Railway was formally opened on Thursday, the 16th inst., for mineral traffic. It is eight miles in length, and extends from Glazebrook to the Lancashire Union Railways, near Strangeways Hall Collieries, Hindley.

At a meeting of the Kirkley Burial Board held last week, designs prepared by Mr. J. L. Clemence, of Lowestoft, for chapels, lodges, lychgate, &c., for the new cemetery were approved, and it was decided to advertise for tenders.

The completion of the new Workington and Cleator Junction Railway was celebrated last week by a public banquet, and also by a dinner to the men in the employ of the contractors, Messrs. R. Ward and Co. The line is 14¾ miles long, and the engineers have been Messrs. J. Wood and A. H. Strongitharm.

At a meeting of the Carlisle Diocesan Church Extension Society held last week, the following grants were made:—Restoration of Kirkland Church, £50, towards £450, Mr. Ewan Christian, architect; Ambleside parsonage, £200; and Kirkby Ireleth parsonage, £200.

A marriage ceremony, in which both bride and bridegroom were deaf and dumb, was performed last week in a Liverpool church. The bride, Miss Wells, has been a teacher in the institution in Oxford-street, and the bridegroom, Mr. J. R. Brown, is an artist and assistant master at the Liverpool School of Art, the students in which institution sent a handsome wedding present to their instructor.

The trustees of Maryport decided on Wednesday week to dismiss their present surveyor and sanitary inspector immediately, and to advertise for a successor, who is to be offered a salary of £120 a year.

The new church of St. John the Baptist, at Higglescote, near Leicester, was consecrated on Monday by the Bishop of Peterborough.

New Board schools in Whitfield-street, Tottenham-court-road, were opened on Saturday. They are the nineteenth group of buildings erected by the London School Board, and accommodate 150 boys, 150 girls, and 205 infants.

Three new blocks of buildings have just been added to the Shoreditch District Schools at Brentwood. They have cost about £17,000. Mr. W. Lee was the architect, Messrs. D. C. Jones and Co., of Gloucester, were the contractors, Mr. Fraser the engineer, and Mr. Daniel the clerk of works.

Northleigh Church has suffered considerable damage from moisture, in consequence of defective gutters, walls, and roofs. These have been taken in hand and rendered, as far as possible, secure. The interior has been painted with Griffith's silicate paint, and redecorated throughout in rich tones of colour and gold by Mr. John Algar, of Gandy-street, Exeter.

The parishioners of Allhallows, Exeter, feeling an attachment for their old church (notwithstanding the town council for some time past has been negotiating for its demolition, to make certain very necessary street improvements), have repainted the interior and done a little in decoration. The old paint has been removed from the pews, and the deal stained and varnished. The beautifully-carved oak pulpit and pew doors, which for generations have been stained and oiled until they resembled a chimney's back, are shown to be fine old English oak, of rare beauty and quality. The work has been executed by Mr. John Algar, of Gandy-street, Exeter.

The mission church at Fearnall Hall, which has just been completed and opened, is in the Gothic style, built of red bricks with Bath-stone dressings, the roof being covered with Broseley tiles. Internally, the church measures 60ft. by 25ft. The whole of the works have been carried out by Mr. E. Simmonds, contractor, Worcester, from the designs and under the superintendence of Mr. R. B. Morgan, architect, Birmingham.

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ILLUSTRATIONS.

TOWER HOUSE, BEDFORD-PARK. — PARLOUR FURNITURE. — FARM HOMESTEAD AT LAWFORD.—QUEEN ELIZABETH'S FREE GRAMMAR SCHOOL, HALIFAX.—ST. MARY'S CHURCH, MONMOUTH.

OUR LITHOGRAPHIC ILLUSTRATIONS.

TOWER HOUSE, BEDFORD PARK, CHISWICK, W.

This detached residence has just been erected at Bedford Park on the estate to which we have already on several occasions referred when illustrating the various houses for the middle-class now built there, and also when we published drawings of the Bedford Park club-house and church, all of which buildings, as well as that which we illustrate to-day, are from designs furnished by Mr. R. Norman Shaw, R.A. The first houses erected on the estate in 1876 were designed by Mr. E. W. Godwin, F.S.A., and remain among the most picturesque as yet erected, but their plans will not compare with those now building. We illustrated them at the time. The church is in an advanced stage, and will be finished by about February next year, in obedience with the terms of the contract, which was taken by Messrs. Goddard and Son, of Faversham. The house herewith illustrated by plans, elevations, and a view, is situated to the rear of the club grounds, from which the garden front, as seen by our sketch, was taken. The work was executed by day-work. The materials are red brick for the walls, and tiles for the roofs. The belvedere is covered with copper, and the large bays are finished in rough cast. The external woodwork is painted white. The dining-room is panelled with a high oak dado made with the old pewing, we believe, from one of the old churches in the City.

PARLOUR FURNITURE.

These two interesting pieces of furniture have been made by Mr. William Watt, art cabinet-maker, of Grafton-street, W.C., where they may be seen. Both articles were designed by Mr. E. W. Godwin, F.S.A., and the four painted panels of the Beatrice Cabinet, representing the Four Seasons, were executed by Mrs. Godwin, who is a daughter of the late Mr. Birnie Philip, the sculptor. This cabinet is made of red mahogany, and is a bright and elegant piece of furniture. The "companion book-stand" is a novel contrivance having four sides, and turning on a centre which stands on a tripod, so that a considerable number of books may be consulted by a reader who may be sitting at a writing table, without quitting his seat. All the drawings which we give are to scale.

FARM HOMESTEAD AT LAWFORD, ESSEX.

These buildings were erected in the year 1871, for F. M. Nichols, Esq., of Lawford Hall, near Manningtree. The buildings and the two open yards shown on the plan attached to the bird's-eye view cover an area of 241ft. by 93ft., exclusive of the apsidal end of the barn. But, besides these, there are poultry-houses of a total length of 90ft. by 20ft. wide, which do not come into our view, at the left-hand corner of which is shown the bailiff's house. We have been favoured by Mr. Nichols with the following particulars:—Good red bricks made by the proprietor on the spot, at the moderate cost of 18s. 6d. a thousand, were used throughout, the roofs being covered with corrugated tiles, and the bailiff's house with plain red tiles. The embattled gables of the latter are a feature which arose from the close proximity, viâ Harwich, of the Antwerp gables. The lower story of the bailiff's house includes the farm-dairy and a large farm kitchen. The dairy is so placed as to be cool in summer, and it is warmed in winter to the proper temperature by warm water-pipes laid out from the boiler of the farm kitchen range. An ample and constant supply of water is brought down by pipes from a spring in the adjoining hill and laid on to the two lower floors of the house, to all the cattle and horse-troughs in the homestead, and to the poultry-yard, so that the uncertainty and cost of manual water-carriage is avoided. The total cost of the buildings shown in the view, together with the poultry-houses, laying on water, homestead fittings, and fixtures in the house and dairy, was £3,255, and down to the present time not the slightest crack or settlement is anywhere to be seen. The whole of the buildings were designed by Mr. W. Lewis Baker, Mr. J. L. Baker, of Hargrave Kimbolton, agricultural engineer, being consulted as to their general arrangement. Mr. Hawkins, of Monks Eleigh, contracted for and carried out the whole both quickly and well. Four hundred and twenty acres, of which two hundred and seventy are arable, are attached to this homestead, which, with the buildings and yards fully stocked, conveniently accommodates twenty breeding cows, fourteen fatting beasts, thirty-five young bullocks, heifers, and calves, one bull, and two young bulls—in all, fully seventy head of stock. The covered yards are neither drained nor asphalted, there is no excess of moisture, and the manure thus made is excellent. There is stabling for twelve cart-horses, with two or three colts, and two nags. Uusually, the pigs altogether number fully sixty, including twenty-four in fatting, and four breeding sows. One hundred pigeons are housed above the entrance of the central covered yard, and two hundred fowls and fifty ducks in the poultry houses, while adjoining the extensive implement shed is an infirmary for sick animals. The proprietor wishes to add that eight years' use has not led him or his very able bailiff to desire any alteration in the arrangement or proportions of the several departments of this homestead.

HEATH GRAMMAR SCHOOL, HALIFAX.

This school, founded in the reign of Queen Elizabeth as a free grammar school, has just been rebuilt. The architects are Messrs. Leeming and Leeming, of Northgate Chambers, Halifax. The style of architecture chosen for the design is that prevailing at the time the school was founded. The only relic of architectural interest in the old school was a rose window, and this is preserved in the covered drill-ground, situated to the south-west of the school. An exact copy of this window has been placed in the centre gable, shown on our illustration. The plan of the school is somewhat in the form of the letter E, the assembly hall (50ft. by 30ft) being placed longitudinally and parallel to the front elevation. The accommodation provided is for 200 boys, and fifty day boarders, and comprises on ground-floor class-rooms, each 21ft. by 18ft., masters' room, library, cap-room, lavatory, and porter's room. The science lecture-room, students' and professors' laboratories, also museum, all *en suite*, are situated on the north-west frontage of the first-floor, are to be fitted up with the best and latest appliances for scientific teaching. The school of art room, modelling and art store-rooms, together with a class-room, correspond in disposition with the science-rooms, but to the north-east. The site sloping towards the east, advantage has been taken to make a dining-hall and cooking-kitchen, and caretaker's rooms in the basement, though out of the ground. Detached from the main building is another building comprising gymnasium (with dressing-rooms and gallery) and covered drill ground. The latrines are placed behind the gymnasium, accessible from the drill shed. The outside walls are in local ashlar and outsides, the joiners' work being in pitch pine, and the staircase in oak. The work generally has been satisfactorily completed by local contractors, the clerk of works being Mr. R. F. Bryan. The contract sums amount to a little over £8,000, but the entire cost will be about £10,000, exclusive of the land. The sum includes playground, boundary walls, additions to masters' house, &c.

ST. MARY'S CHURCH, MONMOUTH.

The church of St. Mary, Monmouth, is a building of no architectural talent whatever, tacked on to a fine steeple. Its internal arrangements are very inconvenient, and insufficient for the wants of the parish. It is intended, without removing the old walls of the present nave, to make various alterations in them, to put new arcades and roof, and to add transepts and a chancel to the end of the existing church, thus very largely increasing its area, and adding both to the accommodation, and also to the architectural importance and character of the edifice The work is likely to be commenced forthwith.

"BUILDING NEWS" DESIGNING CLUB.

SECOND LIST OF SUBJECTS.

1. A small branch bank in a village street. Building to have a corner street frontage of 18ft. by 22ft., and to consist of public office in front on the ground-floor, with manager's office at the rear, with strong room and lavatory, w.c., &c., for the clerks. On the two upper floors, a residence to be arranged for the manager, with a private entrance from the street on one side. Two elevations and plans, or a sketch in lieu of one elevation. Scale, 8ft. to an inch.

2. A cabinet sideboard, 4ft. 6in., for a small parlour, having two drawers, and a glazed cupboard in upper portion for a few articles of old china, &c. To be executed in mahogany. Inch scale, and details full size.

CHIPS.

The Russian historical painter, Gustav von Dittenberg, died in Moscow, on October 15, at the great age of 85. He was a painter of considerable reputation in Vienna more than 40 years ago, when the Emperor Nicholas induced him to settle in St. Petersburg, in order to paint scenes from Russian history.

Dingler's Journal states that V. L. Dagusan heats coal or wood-tar in a boiler until the water is all evaporated, adds finely powdered marble or limestone that has been previously burnt, stirring in 5 per cent. of iron oxide, silicate of potash, and gypsum, and mixing the whole thoroughly. This forms a good artificial asphalte.

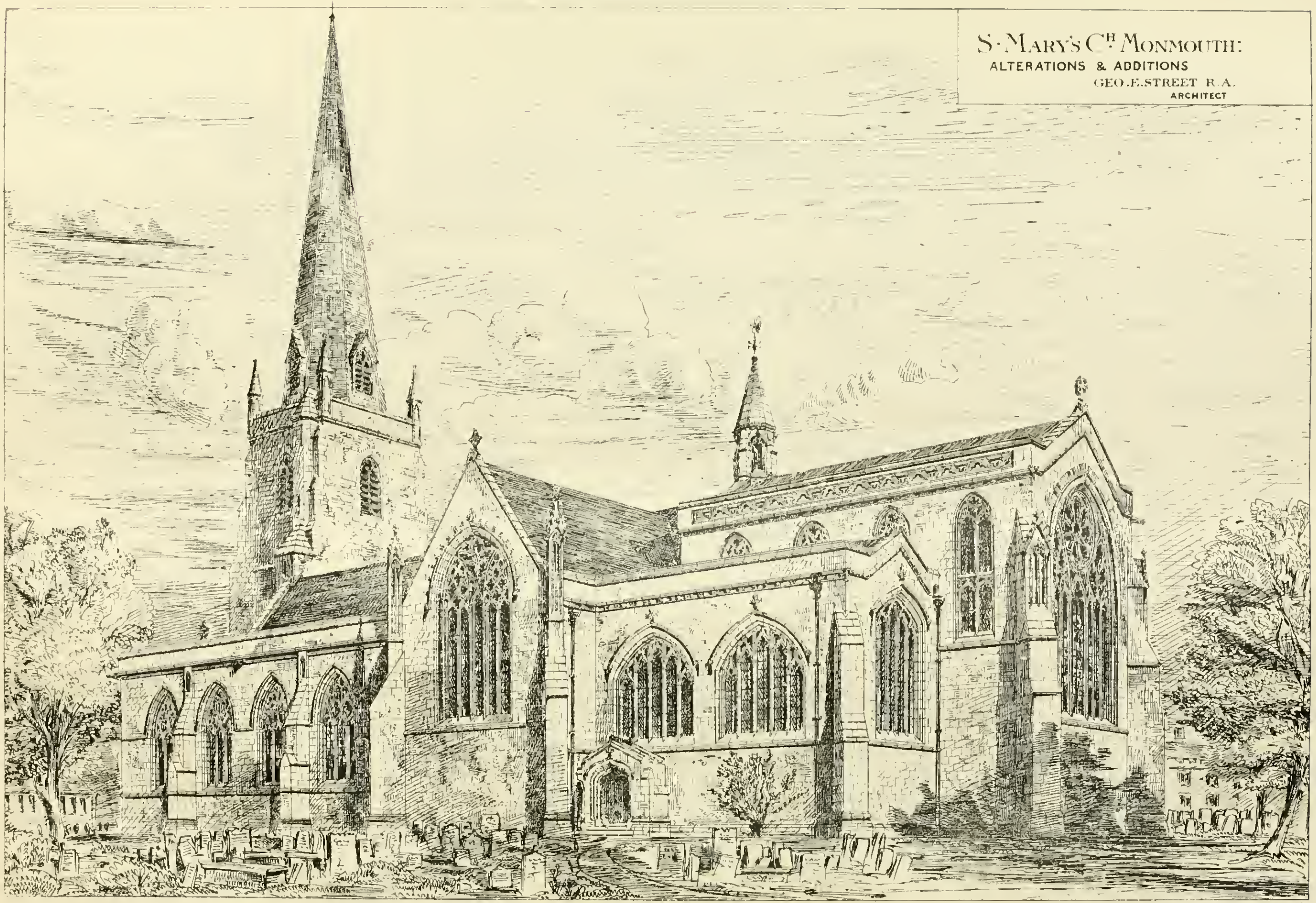
The St. Pancras guardians have resolved to instruct Mr. Bridgman to prepare a correct block plan of the workhouse site, for the purpose of ascertaining if the present area is capable, by rebuilding, of providing for the future requirements of the parish.

The foundation-stone of the new Corporation offices at Southampton was laid on the 22nd inst. Mr. James Lemon is the architect, and Mr. John Crook the builder.

Last week a bazaar in aid of the Prudhoe Memorial Convalescent Home at Whitley was opened in Newcastle-on-Tyne, by the Right Hon. the Earl Percy, M.P. The building, which was erected in memory of Algernon, Duke of Northumberland, formerly Lord Prudhoe, was begun about twelve years ago, and was built to accommodate 100 convalescents, at a cost of £20,000, raised by public subscription. Last year a wing to accommodate 50 more was added, at a cost of about £4,000; and there are yet in contemplation a female wing to accommodate 30 or 40 more additional, and also other buildings. The original building and its extension were erected from designs by Mr. Thomas Oliver, architect, of Newcastle. There is still a balance owing to the building of the new wing; and the primary object of the bazaar was to obtain funds with which to liquidate this account. The proceeds amounted to about £2,500.

Mr. Andrews, the town surveyor of Bournemouth, sent in his annual report on the 21st, accompanied by a letter asking for an increase of salary, and suggesting that the increase be £100 per annum. A proposition was made that the increase should be £50; but it was ultimately decided unanimously that it should be £100 per annum. His salary will therefore now be £300 per annum.

A new coffee-tavern is in course of erection in Park-road, Crouch-end; the contractors are Messrs. Mattock, Bros., of Wood-green.

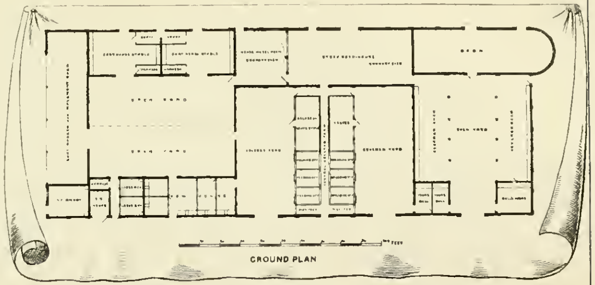


S· MARY'S CH. MONMOUTH:
ALTERATIONS & ADDITIONS
GEO. E. STREET R.A.
ARCHITECT

Photo Lithographed & Printed by James Akerman, 6 Queen Square W.C.

FARM HOMESTEAD AT LAWFORD ESSEX

for F. M. Nichols esq^re W. Lewis Baker ARCHITECT



GROUND PLAN

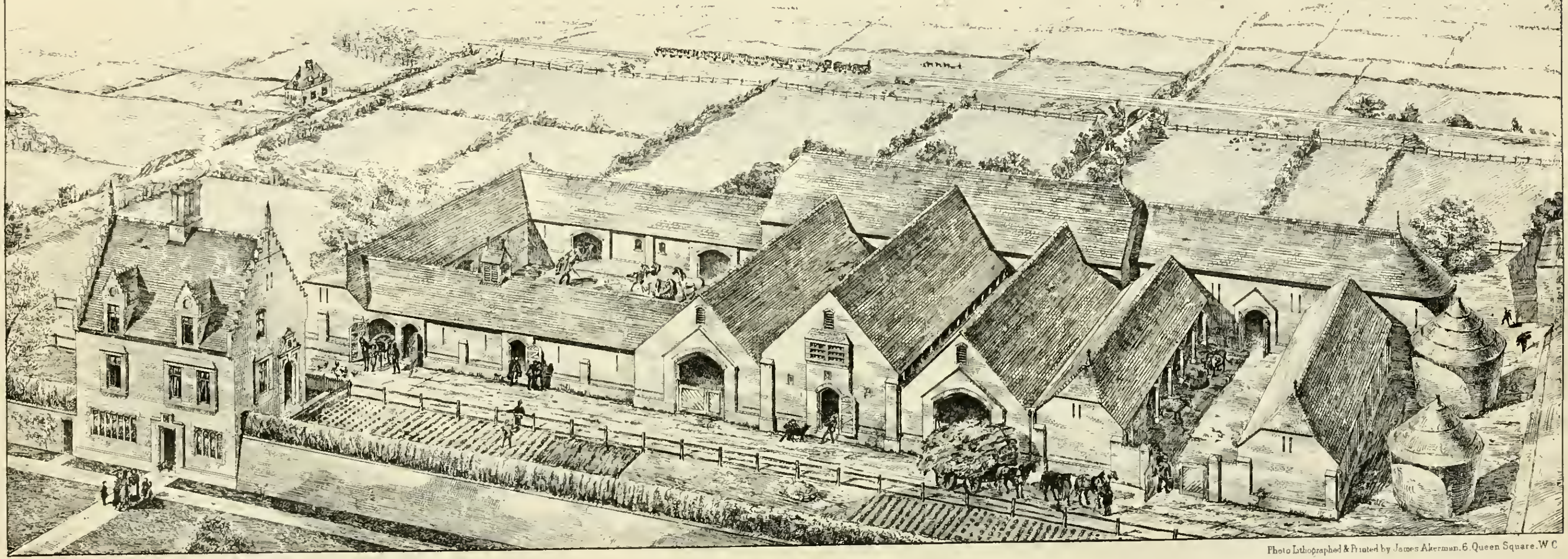
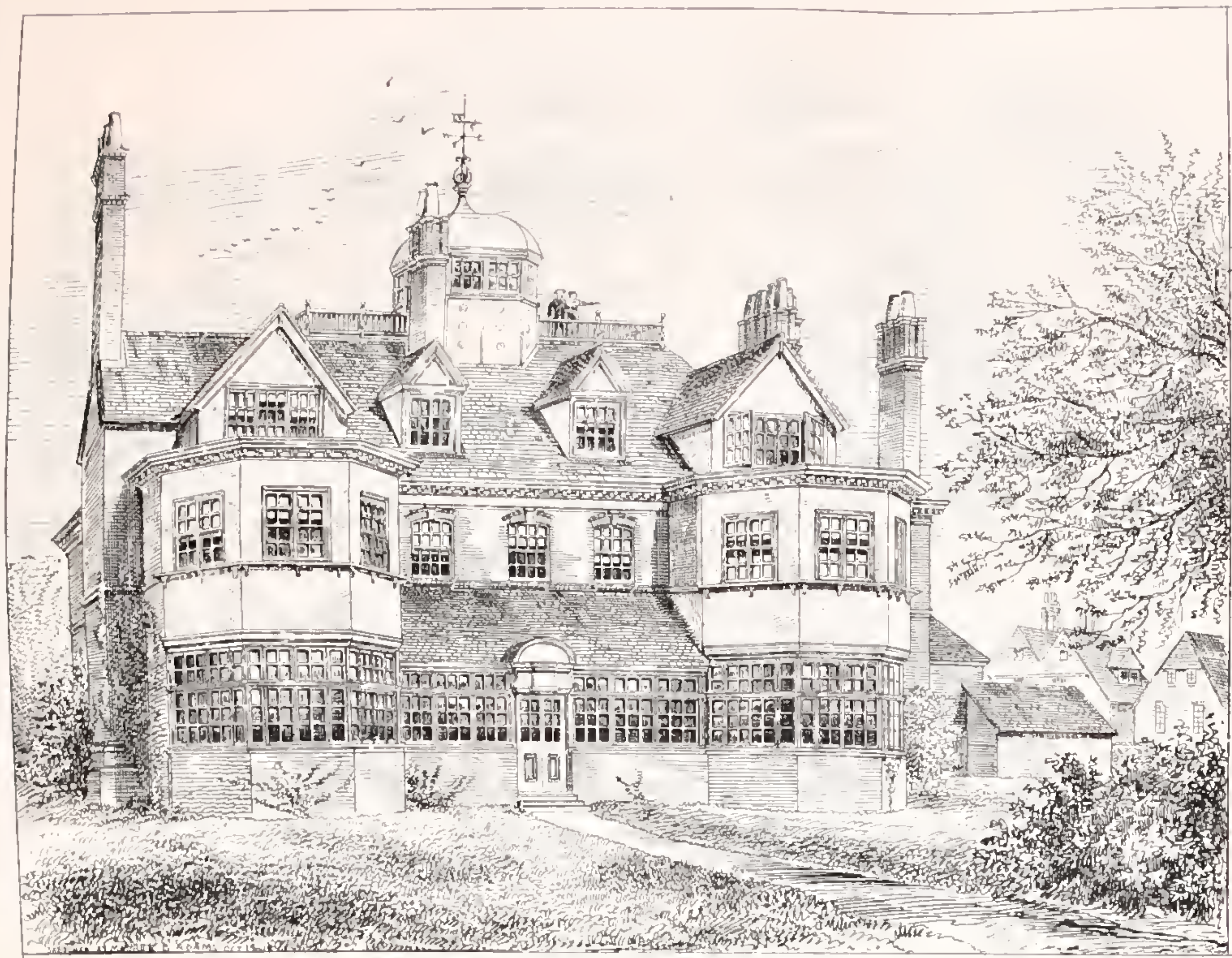
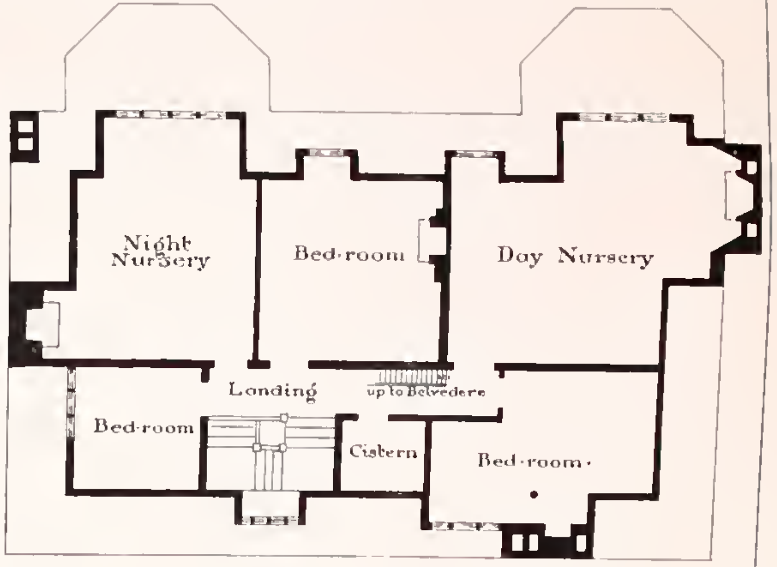


Photo Lithographed & Printed by James Akerman, 6 Queen Square, W.C.

· TOWER · HOUSE ·
A DETACHED RESIDENCE
BEDFORD PARK CHISWICK·W·

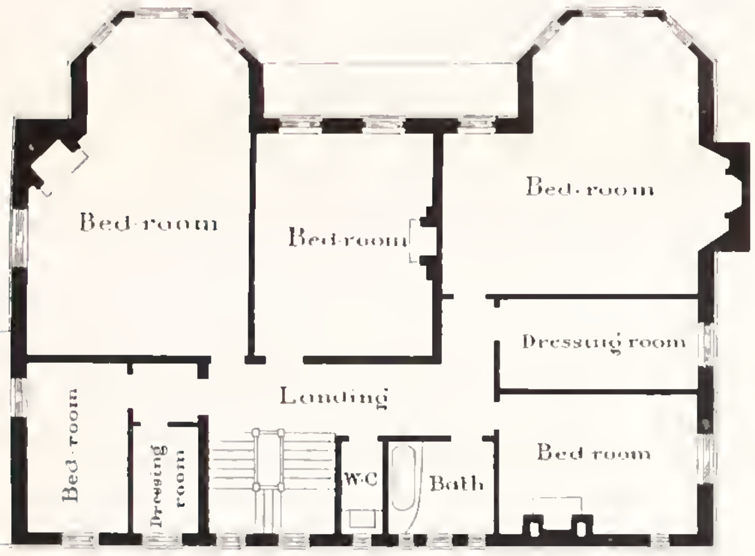


Sketch of Garden Front

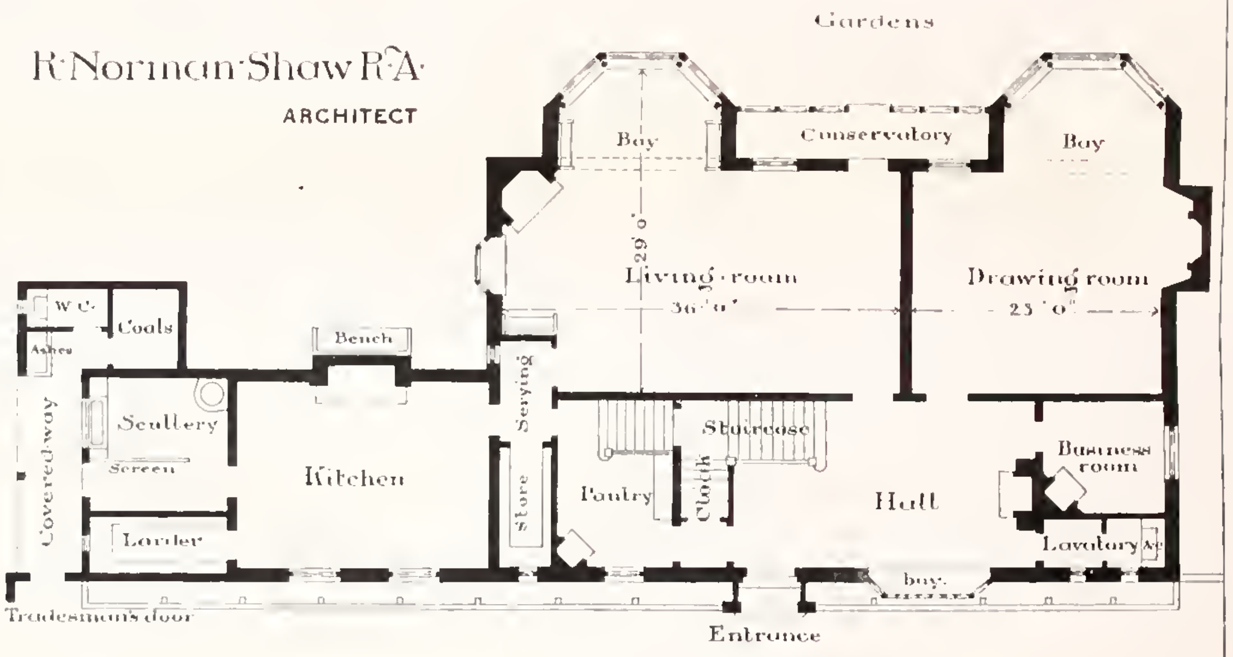


Top-floor-plan

R. Norman Shaw R.A.
ARCHITECT

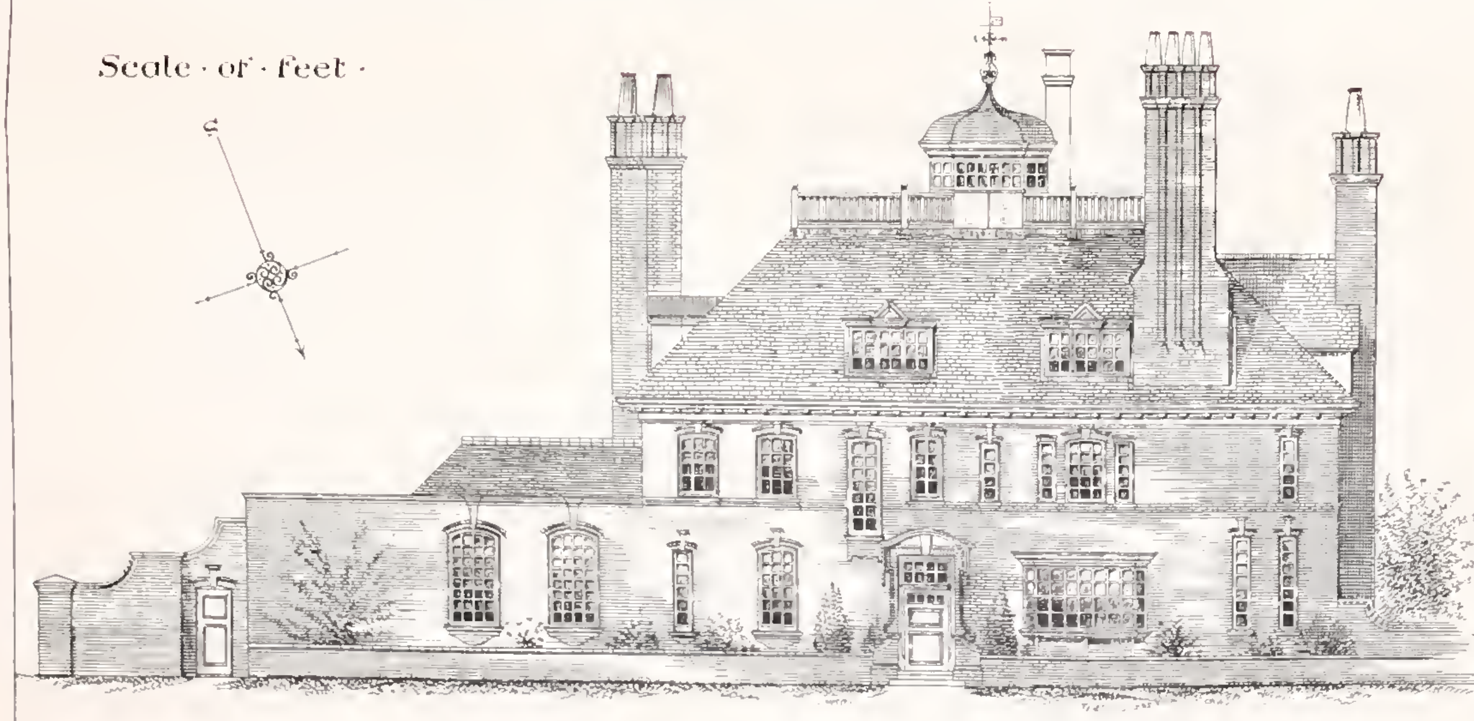


First Floor Plan

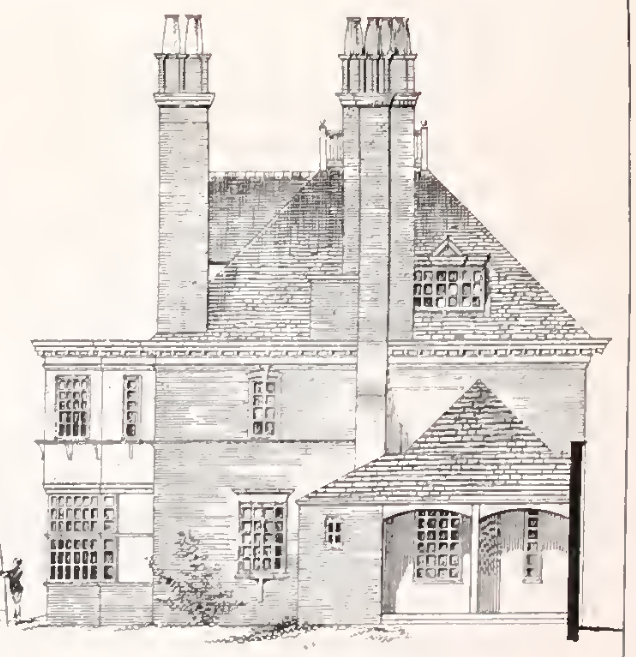


Ground Plan

Scale · of · feet ·



Entrance Front



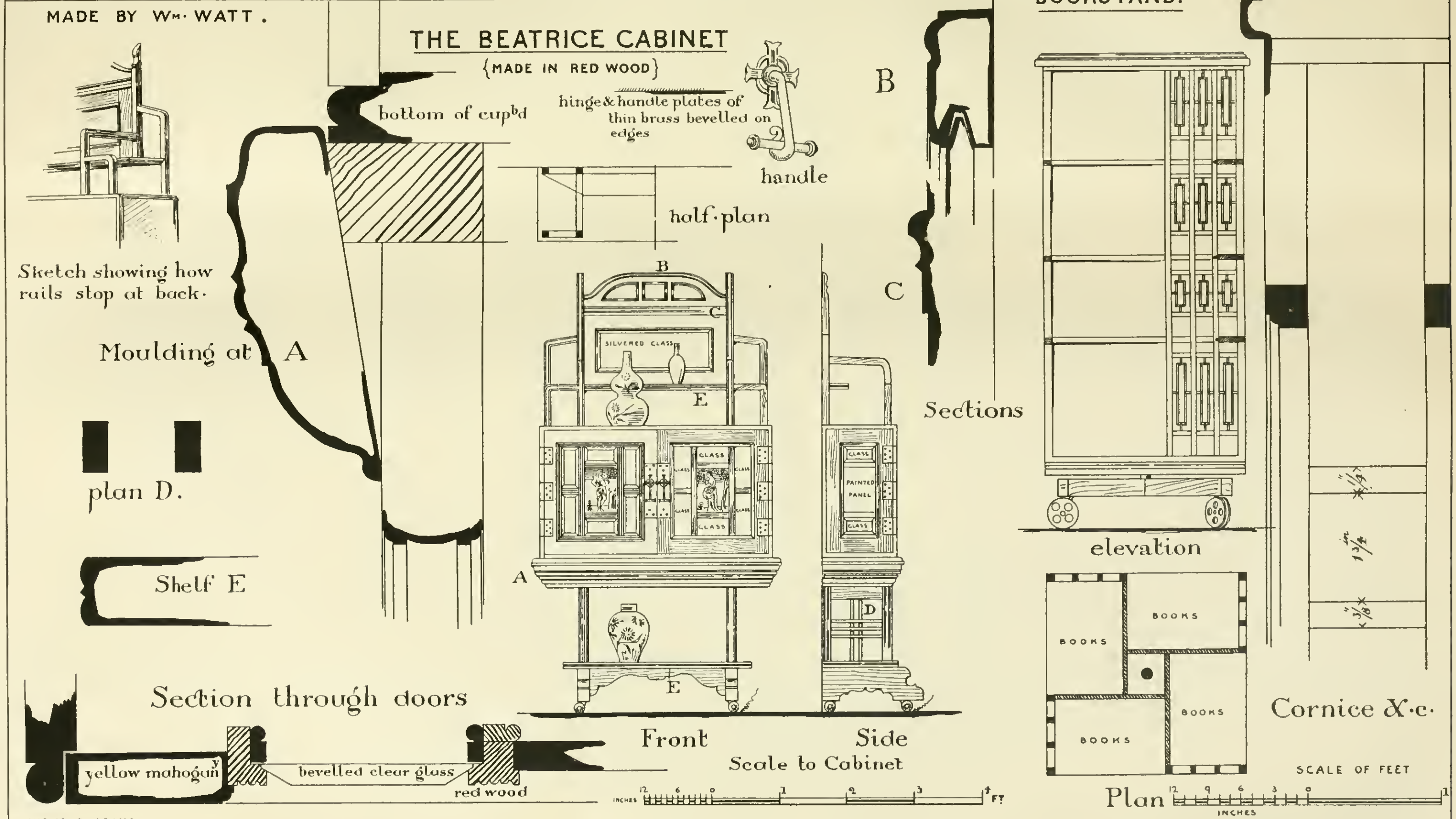
East End

MAURICE B. ADAMS del.

Photo Lithographed & Printed by James Akerman 6, Queen Square W.C.

PARLOVR FVRNITVRE DESIGNED BY E.W. Godwin F.S.A.

MADE BY Wm. WATT.



MAURICE B ADAMS DEL.

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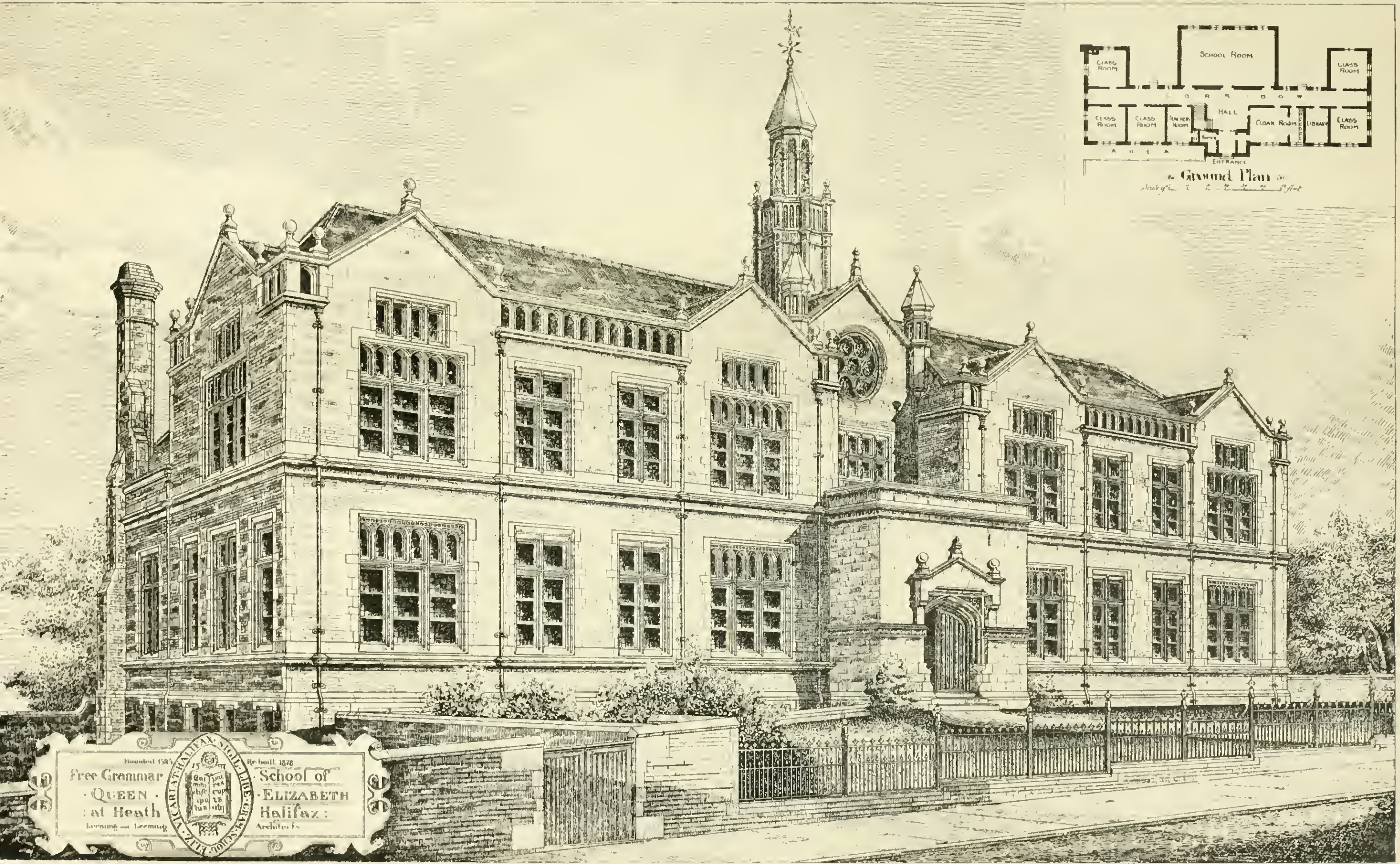

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Delineated by the Architects 1879

RESTORATION OF DEWSBURY PARISH CHURCH.

MR. GEORGE EDMUND STREET, R.A., has reported as requested on the proposed restoration of Dewsbury Parish Church as below:—

"In this case we have to deal with a building which consists in part of some very interesting relics of a 13th-century church, which, as far as the exterior is concerned, was almost entirely altered in the very worst description of pseudo-Gothic, about, I suppose, a hundred years ago. The most ancient portions of the work are the two arcades dividing the nave from the aisles and the chancel arch. The southern arcade is a good, simple work of the 13th century; but that on the north side is one of the most delicate works of its kind that I know. The columns are clusters formed with a central column only 8½in. in diameter, round which four smaller shafts are grouped. Notwithstanding the extreme delicacy of these proportions, the work was so well done that there is no sign of settlement or decay in it. The chancel is old, but less interesting. It has a good thirteenth-century doorway in its north wall, which has the appearance of having been rebuilt, some old windows in the side walls, which contain some fine fragments of fourteenth-century glass removed from the old east window, and a new eastern window filled with new stained glass. There is a low clerestory to the nave, with an old roof and a tower at the west end of the same bastard style as the rest of the exterior of the nave. The seats and floors in the church are all badly arranged, and to a great extent in a very bad condition. The accommodation provided is very much smaller than you suppose it to be. Upon the assumption that 20in. in width is allowed for each person, I find that there is accommodation (exclusive of the chancel) for 523 persons on the floor and for 371 in the galleries, or in all for 894 persons. This is about what I supposed when I first looked at the church, for it is but a small building, and quite incapable of containing the large number of worshippers for which some of your body imagined that seats existed. In so large a town it is obvious that this amount of accommodation is far below what it ought to be, and the question arises whether what is required can be obtained by an enlargement of the existing building, or whether the erection of an entirely new church is the only course open to you. In my opinion, the former is the common-sense and in every way the best mode of dealing with the work. There is no reason whatever for destroying the fabric of the nave and its aisles or of the western tower. They might be repaired where necessary, and if funds admit of it, their external architectural details, as well as the roofs of the aisles, might be immensely improved without taking down any of the walls. The flooring and seating might be renewed on a better system, and the tower raised an additional stage and otherwise altered so as to suit the increased size which it will be necessary to give to the church by a large eastern extension. In making my plan, I have assumed that the Parish Church of Dewsbury ought not to seat less than twelve hundred people on the ground floor; that all the seats ought to be uniform in size and design; and that there should be ample accommodation for a good organ and choir. To accomplish all this, you will see that it is absolutely necessary to double the area of the existing church. Fortunately, the size of your churchyard allows of this being done, and the only difficulty will be to so contrive the addition as not to overwhelm the existing building by one of an entirely different scale and proportions. The plan which I have made will not do this. To the east of the present nave and aisles I propose to build a double transept, and beyond this a chancel and chancel aisles. The arcades for the extension of the nave will be carried beyond the transepts on each side of the chancel, so that in addition to the four arches of the present nave there will be four arches also opening into the transepts and chancel aisles. I propose not to disturb the existing chancel arch, which is of the same height and character as the beautiful arcade on the north side; and I propose to mark the new chancel, not by a second chancel arch, but only by a screen, and a different arrangement of the floor-levels and seats. In this way, as you will see, every portion of the floor will be utilised, and as far as possible the whole of the seats will be equally good. It is impossible in so large a church that they can be absolutely equal; but my endeavour has been to make them in this case as little inconvenient in any case as is possible. I propose to provide three principal entrances—one through the tower, and two by porches on the south and north sides of the church; and in all arrangements can be made, by means of double swing-doors, to prevent draughts of cold air. It will be noticed that the new chancel will be wider than the present church. This is really necessary if the choir arrangement is to be satisfactory; and in execution it will not be unsightly, nor will it be so much noticed as it is on the ground plan. The church, enlarged in the way I have suggested, will require a tower of much more importance than the present one; but as the fabric of this is in good condition, what I propose is to add a belfry-stage—of about 30ft. in height—of rich architectural character, to alter the windows and doorways, and to make a wider arch in the east wall. In this way, at much less cost than a new tower would involve, I should be able to give you a steeple worthy of the enlarged church. The expense of the plan suggested will be great; but, of course, not by a good deal so great as that of an entirely new church. I estimate that the cost of the whole eastern extension will not exceed £13,000, and may probably be executed for less. The cost of the additions to the steeple I estimate at £2,250; and that of the reseating altering, and repairing of the nave and aisles to a sum of £2,800. This last includes new roofs to the north and south aisles and the repair of the old nave roof."

YORKSHIRE FINE ART AND INDUSTRIAL EXHIBITION AWARDS.

THE awards of the judges to the exhibitors at the Yorkshire Fine Art and Industrial Exhibition have been printed. These apply to all the departments except that devoted to the Fine Arts. The judges were nominated by the exhibitors, but the Executive Committee made the provision that no exhibitor or member of that committee should act as a judge. Medals have only been awarded to the actual producers or the designers of the articles shown; but certificates have been given to the dealers in the articles where they were deemed worthy of distinction. The number of medals is 138, and of certificates 139. The following is a list of such of the successful exhibitors as our readers are likely to be interested in:—

Colman and Glendenning, Chalk-hill Works, Norwich—Certificate, for school furniture; Crossley D., Brighouse—Certificate, for patent self-acting valve ventilators; Crossley Bros., Manchester—Medal, for "Otto" silent gas engine; Cooke and Sons, York—Medal, for lathes and wheelcutting machinery, also for turret clock, with electro-motor; Campbell and Smith, London—Certificate, for stained glass for domestic use; Camm Brothers, Birmingham—Medal, for stained glass windows and painted tiles; Doulton and Co., London—Medal, for "Doulton" ware, and certificate, for sanitary ware; Gibbs and Howard, Charlotte-street, Fitzroy-square, London—Medal, for tile panel of "St. Paul before Festus"; Gillow and Co., Lancaster—Medal, for carved and inlaid 17th-century cabinet; Helliwell, T. W., Brighouse—Medal, for system of glazing; Jones and Willis, Birmingham—Medal, for superiority of design and workmanship in wood and metal work, and embroidery as applied to ecclesiastical purposes; Powell Brothers, Park-square, Leeds—Certificate, for stained glass; Rendle W. E., London—Medal, for system of glazing; Reynolds G. W. and Co., London—Medal, for mortising and other machines; Salmon, Barnes and Co., Ulverston—Medal, for revolving shutters; Shrigley and Hunt, Lancaster—Medal, for the best domestic work in stained glass, and excellent work in painted tiles; Wright, Sutcliffe, and Co., Halifax.—Medal for brass cocks, &c.

The sanitary purposes committee of the town council of Preston have recommended that body to apply to Parliament in the next session for powers enabling them to require notices to be given in cases of infectious disease; the closing schools, &c., in the like case; to erect temporary hospitals, and to control the situation of closets, slop-stones, and sink-pipes.

At a meeting of landowners held at Lewes on Wednesday week, it was decided to interview the directors of the London, Brighton, and South Coast Railway Co., to request them to complete the Ouse Valley line of railway, began some years since and abandoned, from Sheffield Bridge at Newick to the junction at Hellingley, with the Tunbridge Wells and Eastbourne Railway. It was pointed out that if the section between Uckfield and Sheffield Bridge, about four and a half miles in length, were completed as partly constructed, it would save 15 miles in the distance between that town and London.

COMPETITIONS.

Ipswich New Corn Exchange.—A special meeting of the Ipswich town council was held on Wednesday week, when the report of the Corn Exchange Committee was presented. Of the 15 plans sent in, varying in estimates from £12,000 to £25,000, they unanimously recommended that signed "North Light," as entitled to the premium of 100 guineas. The cost, as estimated by the author, was £17,818, and the committee recommended that it be referred to them to confer with the architect as to reducing the cost to the sum proposed to be expended—£16,800. The report was unanimously adopted, and the author proved to be Mr. B. Binyon, of Ipswich, who in his accompanying letter said he could "also adapt several of the good points in his other design—viz., Economy" (No. 1). It appears that the premium will, if the design be carried out from the successful competitor's plan, merge in the commission. In our criticism of the designs submitted (see issue for 10th inst., p. 419) we described the one signed "North Light" as "a well-considered arrangement in the Italian style, although the author has failed to express externally the character of the building. . . The main feature is the mode of lighting indicated by the motto. The author estimates his design at £17,848—a figure much too low."

New Wesleyan Chapel at St. Catherine's, Lincoln.—Over 40 sets of designs were submitted, and after carefully examining them, the trustees selected that under the motto of "The World is my Parish" for the first premium, and that of "Faith" for the second place. The author of the first-named is Mr. Charles Bell, London, and of the second, Messrs. Bellamy and Hardy, of Lincoln. The cost of the chapel is to be £5,000.

CHIPS.

We are asked to correct the statement in "Chips," on page 474 of our issue of the 17th inst., where the purchase-money for the subscription gardens at St. Leonard's is stated to be £70,000. This should be £7,000.

Near the West station, Croydon, an important educational building, to be known as the Croydon High School for Girls, is now being roofed-in. It is in style Renaissance, very plainly treated; is on plan a parallelogram, the wings being carried up higher than the central part of building. The materials used are stock bricks, with terra-cotta and freestone dressings sparingly introduced. The builder is Mr. W. Marriage, of Croydon.

The Midland Railway Company have acceded to the request of the inhabitants of Crouch-hill and South Tottenham, and a new station for these districts is in course of erection opposite the Tile-kiln works, Finsbury Park, on the Broad-street line.

The silver medal and first prize for hygiene and public health at the summer session of University College, London, has been awarded to Dr. J. Wilkie Burman, late medical superintendent of Wilts county lunatic-asylum.

An amateur fine-arts exhibition, to which the Duke and Duchess of Beaufort and other titled local residents have contributed, was opened at Chippenham on Monday week.

The British Lying-in Hospital, York-road, Lambeth, has just been reopened after internal reconstruction, under the superintendence of Professor de Chaumont, of Netley, and Mr. W. Eassie, C.E.

The Local Board of Haslingden are carrying out an extensive scheme of sewerage works. It is intended to utilise the sewage by applying it to about 40 acres of land purchased for this purpose. Messrs. Brierley and Holt, of Blackburn, have been consulted as to the Main Outfall Works, and the proposed irrigation, and have prepared a report with plans, &c. The work will be carried out under the superintendence of Mr. Bretherton, surveyor to the Board.

New waterworks are about to be established at King William's Town, South Africa, under the supervision and according to a plan prepared by Mr. F. Holman, C.E., late of Lewes, Sussex. The water will be brought a distance of seven miles, and will replace the use of that from the Buffalo River, which is anything but pure.

Four stained-glass windows have just been placed in the parish church of Sutton, near Petworth. Each is of two lights, and contains figures of one of the Evangelists, and one of the Major Prophets. Messrs. Clayton and Bell executed the designs, and the fixing was carried out by Mr. S. Dearling, of Arundel.

Building Intelligence.

Baguley.—St. John's School, Baguley, Cheshire, which was recently opened, is composed of a large room, class-room, porch, &c. The interior is lined with white brick throughout, with pitch-pine dado, which has a very good effect. The largest room is 36ft. long by 24ft. wide, with open-timbered roof 25ft. high in the centre. The class-room is 24ft. long by 12ft. wide. The porch is lined with pitch-pine, and is used for the cloaks and hats. Ventilation and warming is done by means of Shillito and Shorland's patent ventilators and grates. The outbuildings consist of the usual offices, fitted with earth-closets, and coal and ash places. About 1,200 square yards is taken up by the site. In style the building may be termed "Picturesque." The entire work, including bell and bell-turret, making playground, forming boundaries, &c., was executed for the sum of £510, which is a small amount considering that the school will accommodate 140 children. The builders were Messrs. Elms and Evans, Greenheys, Manchester; and the architects Messrs. Smith and Heathcote, of Moseley-street, Manchester, and Abchurch-lane, London.

Bristol.—The memorial-stone of the David Thomas Memorial Church at Bishopston is laid to-day. The entrances to the church from the main road are through open porches and lobbies, from which access is had to the ambulatories or low aisles running the length of the nave, and divided from it by moulded freestone arcading. Above the arches of this arcading rise lofty clerestory windows, with rose windows above. Additional porches at the chancel end will be used by the minister, the choir, and also by the congregation. The vestries for the minister and the choir are on either side of the chancel. The total length of the church and schools is 166ft., and of the church itself 91ft. inside the walls; the width within the aisle walls, 52ft., and between those of the clerestory 42ft. From the floor to the centre of the vaulting is 38ft., and to the top of the nave capitals 24ft. In describing the general design of the church, it may be said that it results in a lofty nave from front to back, while on each side are three gabled transepts intersecting with the nave. The chancel, semi-octagonal in plan, is lighted with seven lancets and rose windows. The style is English of an early period. The contractor is Mr. E. C. Howell, and the architect, Mr. Stuart Colman. — The consumption of gas in the suburbs of Bristol has of late increased and necessitated the construction, by the Bristol United Gas Company, of a new station and extensive works at Stapleton. Nearly 30 acres of land were, therefore, acquired, and upon this plot the works have been erected from the designs of the company's engineer, Mr. Walter Fiddes. The works consist of a large retort-house with 12 double retort-arches and of sufficient capacity for the production of a million and a quarter cubic feet of gas per day. There is also another building, which comprises a purifier and a meter-house. Then come the engine-house, two pump-rooms, a boiler-house, tar-tank, and liquor-tank, with all the requisites of a large gas-making establishment. The buildings are all constructed of Pennant stone, the product of the locality. The construction of the works has involved the execution of more than 60,000 cubic yards of excavation, and notwithstanding the heavy nature of the contract generally, the works have been successfully completed in the short space of nine months, by Messrs. John Aird and Son, of Lambeth. The works were opened on Tuesday week.

Carnarvon.—It is proposed to erect a scientific and literary institute at Carnarvon. The services of Mr. Richard Owen, Breck-road, Liverpool, architect, have been secured. The plan is a parallelogram, 77ft. long by 33ft. wide. The style is Gothic, of an Early English character. All the outside walls are to be built of blue Penmaenmawr, or of York shoddies, and freestone dressings. The Bangor-street front will have a handsome shop-front, and above that there will be placed large three lights, mullioned and transformed windows on each floor, the upper ones terminating into gables. The Pavilion road will have a repetition in one bay, with others of various kinds up the street; and all these will be glazed with best polished plate up to transom; and above that will be lead lights of geometrical pattern in colours. The entrance doorway will have a porch with polished granite columns, terminating in a gable with a shield for an inscription. Above this will be a large mullioned staircase window projection, terminating in a turret, with a conical roof, and a vane at a height of 80ft.

Edinburgh.—The new infirmary at Edinburgh was opened on Wednesday. The late Mr. D. Bryce, R.S.A., was intrusted with the planning of the buildings, of which his nephew and partner, Mr. John Bryce, has superintended the completion. The style adopted is the old Scotch Baronial. The Lauriston façade presents a central elevation 100ft. long, with the height of three stories, in addition to a half-sunk basement. From each side of this central building, which is partly appropriated as administrative accommodation, there run out, in the same line, three tiers of corridors giving access to the wards of the Surgical Hospital, and offering, in the front view, as many ranges of large three-light windows surmounted by a stone balustrade. These corridors are continued from end to end of the buildings, and on their north side there are carried out, at right angles, towards Lauriston, four pavilions or blocks of wards, severally measuring 128ft. in length, with an extreme width of 33ft. 2in. In their side elevations the several pavilions show ranges of plain windows, the walls being relieved with string-courses and diversified at the top with stepped gables, small turrets, and chimneys characteristic of the style. The masonry throughout is ashlar, with tooled facings to doors, windows, and gable-heads. There is accommodation for 600 patients. The amount of space provided for each patient varies from 2,350 to 2,380 cubic feet, as compared with 1,800 cubic feet allowed in St. Thomas' Hospital, London, and 1,226 cubic feet in Fort Warren, Massachusetts.

Paisley.—Last week the foundation-stone of the new town-hall, which is at present in course of erection on a site contiguous to the abbey, at Paisley, was laid by Mrs. Clark, of Gateside, mother of the deceased donor, Mr. George A. Clark. After purchasing the site, it was found that the sum in hand would be exceedingly insufficient to erect a hall suitable to the wants of the town, and, therefore, the Messrs. Clark, brothers of the deceased donor, offered to defray the additional cost, which it is calculated will be altogether little short of £50,000. The buildings will consist of a large hall occupying the centre of the block, 130ft. long by 60ft. wide, and affording accommodation for about 4,000 persons —1,400 on the ground floor, 400 in the balcony, and 400 in the upper gallery. There will also be a lesser hall, 53ft. by 30ft., calculated to seat about 300 persons. In addition to these, at the special direction of the deceased donor, there will be a public reading-room, smoke-room, &c. The contractors for the building are Messrs. Morrison and Mason, Glasgow. The completion is expected to be in about two years' time. Mr. W. H. Lynn, of Larne, is the architect. The building was illustrated in the Building News, April 5, 1878.

Saltburn.—The ceremony of consecrating the new chancel and southern aisle of the Church of Emanuel, Saltburn-by-the-Sea, was performed on Friday last. Though a new chancel and southern aisle have been added to the church, and this at a cost of £4,000, it is yet incomplete, the upper portion of the tower and spire, which will run to a height of about 160 feet, being still required. The chancel is the most important part of the new work that has been carried out, and on the southern side is an organ chamber and vestry, at present separated from the chancel and transept by a Gothic perforated pitch-pine screen. The recent improvements were entrusted to Mr. Eugenic E. Clephan, of Stockton. Mr. Thomas Dickinson, of Saltburn, was the builder, and the clerk of the works, Mr. A. M‘Dermott.

Shepton Mallet.—On Saturday afternoon the memorial-stone was laid of a new hospital and dispensary for Shepton Mallet and the surrounding district. The new hospital will be in the Gothic style of architecture, and built of native stone, the three elevations having Bath stone dressings. The roof will be covered with Broseley tiles. The wards will be four in number, and afford accommodation for twelve patients—six of each sex. The premises will occupy an area of an acre of land. The total cost will be from £1,800 to £1,900. The architect is Mr. G. S. Skipper, of East Dereham, Norfolk, and the builders are Messrs. J. and S. Emery, of Shepton Mallet.

Shipbourne.—On Friday last the foundation-stone of a new parish church for Shipbourne was laid. In taking down the church in which the inhabitants have worshipped since 1722, in order to erect the edifice of which the foundation stone was laid last week, remains were found which possibly belonged to the earlier building of the 14th century. Fragments of sharply-cut doorways, traceried windows, arches, and pillars were discovered, shaped in the Early English style; and evidently the church which Lord Barnard built in the reign of Queen Anne had been raised over the site of a much older edifice. The plans prepared by Messrs. Mann and Saunders, the architects, show a structure in the Early English style; and the execution of the masonry work is intrusted to Mr. Allcorn, a Shipbourne resident.

South Shields.—St. Hilda's Church, South Shields, having undergone extensive alterations and repairs, has been reopened. The present edifice was almost entirely rebuilt in 1810-11, and consisted of a large square chamber, 88ft. long by 61ft. wide, spanned by a flat ceiling, and almost entirely devoid of architectural embellishments. The design for the remodelling having been intrusted to and prepared by Mr. J. H. Morton, architect, of South Shields, the work of restoration was commenced, and has been carried out under his superintendence. The alterations have been effected without in any manner changing the present construction of the fabric, or even taking off the roof, as in dividing the body of the church into nave and aisles the roof is now carried by arcading, springing from a colonnade of metal columns with Corinthian capitals, and carrying an entablature over. An additional 9ft. has been added to the height of the nave by cutting away the tie-beams and substituting iron tie rods. This ceiling is coved and relieved by moulded panels and ribs. The ceiling of the aisles remain at the former level, but are panelled and treated in the same manner as the nave. Mr. John Elliott, North Shields, is the contractor for the general work. The total cost will be below £2,500.

Wolverhampton.—The foundation-stone of the new poor-law offices, now erecting in the Horsefair, was laid by the chairman of the board of guardians on the 17th inst. The offices will form the first premises erected on land secured by the corporation under the Artisans' Dwellings Act. They will be three stories in height, and will cover an area of 320 square yards. The walling material is brick, and moulded brick and stone dressings are introduced. They will comprise a dispensary, offices for clerk and relieving officers, consulting-room, &c., and office-keeper's house. The architects are Messrs. Banks and Doubleday, and the builder is Mr. David Evans. The estimated cost is about £2,000.

CHIPS.

The parish church of Writtle, near Chelmsford, was reopened after restoration on Sunday week. Five of the old columns have been replaced by new ones having deep concrete foundations; the clerestory has been rebuilt and three additional windows opened. The roof has been releaded, and three new chancel arches have been erected. The work has cost £1,200, and has been carried out by Mr. James Brown, of Chelmsford and Braintree, from the plans and designs of Mr. F. Chancellor, of Chelmsford and London.

The Congregational Church at Harleston, Norfolk, was reopened on Tuesday after enlargement, refronting, and restoration, almost amounting to a rebuilding. The new front is of red Cossey bricks, and modern benches have been substituted for straight-backed pews. The work, which has cost £1,000, has been carried out by Mr. Grimwood, of Weybread, Mr. Boardman, of Norwich, being the architect.

At Netherseale, Derbyshire, two memorials of a late churchwarden have been placed in the parish church from the designs of Mr. Arthur W. Blomfield, of London. The one is a window which has been filled with stained glass by Messrs. Burlison and Grylls, of Newgate-street, London, and the other is a reredos executed in opus sectile mosaic, by Messrs. Powell and Sons, of Whitefriars, London.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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RECEIVED.—W. S.—G. T. E.—E. and Co.—Sir W. A. R. and Co.—H. B.—C. B.—F. W. R. and Co.—L. R. S. A. —A. C. Frith.—W. G. and Co.

YORKSHIREMAN. (In reply to your query, we recommend galvanised iron for cramps. Wrought iron, unless dipped in hot pitch or coal-tar, would certainly corrode. The cramps shown in sketch are not those usually employed for hollow walls. It is not necessary to turn up the inner end of cramp, but to fork it and make this part tail into the frog of the brick.)—STUDENT. (A steel pen is usually used in making pen-and-ink drawings. Indian ink, "Registration" writing ink, or Featherstone's liquid drawing ink are all suitable, but must be used with firm black lines. Mr. Street uses writing ink and Mr. Shaw generally Indian ink for their drawings. The former uses a rather soft pen, and the latter one of a firmer and harder point.)—E. J. H. (First query inserted, but the other matter has been too frequently discussed to enter upon again. With the numerous advertisements of such appliances in our pages you can have little difficulty in meeting with what you want.)—COUNTRY BUILDER. (We should suggest, if the building is high enough, a longitudinal trussed beam or girder at the position of wall to be removed. Of course, a column or two would be a desirable support in so great a length as 100ft. We should hardly like to trust to the scarfing of tie-beams as suggested in a roof of the span shown. A better plan would be to place a flitch of iron on each side and bolt through, than to trust to scarfing, of course allowing the flitches to rest on both walls.)—T. POTTER. (We have compared plans, and do not think there is sufficient resemblance to justify comment.)

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—Subjudice, No. 90, Try Again, Fleur-de-lis, T.

Correspondence.

ARBITRATIONS.

To the Editor of the BUILDING NEWS.

SIR,—The anomalies incident to arbitrations, and the strange differences in the estimates of the values engaged, together with somewhat incomprehensible awards, have been matters of public comment. It would appear as though the companies or public bodies seeking to purchase properties compulsorily under the provisions of the Lands' Clauses Act were very liable to be fleeced, as the amounts claimed in most cases are so very much in excess of the awards, and it has become quite common now to assert that the valuers for the company put absurdly low figures and that the vendors' valuers put exaggerated estimates as their basis, and the general result is that the umpire divides by two and takes a mean.

This is by no means the case. There is no doubt the valuer for the company takes into his estimate all the depreciatory points in respect to the value of the property, whilst the vendors' surveyors are too apt to shut their eyes to the weak points of the case and to dwell only or principally upon items calculated to raise the estimate of value. The umpire's duties are by these means rendered very responsible. He must have a clear unbiassed judgment and thoroughly practical knowledge. He must be able to sift the wheat from the chaff and to give due weight to every point of importance for and against. Unfortunately, he is embarrassed rather than assisted in many instances by the evidence, and must fall back upon his own experience and judgment, and give an impartial and honest award so at variance with the evidence as to give no satisfaction to either side and to be matter of comment by the general public, whose opinion (without knowledge of the real facts) is that in most instances, arbitration is a solemn, and we may add, expensive, farce, best to be avoided by all who may have any dealings with a railway or other company.

In your last issue is a report of a case heard at Liverpool a short time ago. The Lancashire and Yorkshire Railway Company, having obtained compulsory powers to take certain properties, the matter got to arbitration, and duly came before a jury. Now the result is worth carefully noting. On behalf of the railway company were five experienced valuers (whose nearness in their respective amounts is remarkable), the average of their valuations was £10,821. On behalf of the claimant there were three equally clever and experienced valuers, and the average of their valuations was £20,478. Now let us see what was the sum awarded to the claimant by the jury, who, no doubt were, as is usual in such cases, selected specially on account of their general and local experience as to property and its incidents. The jury gave the claimant the sum of £18,637, and in addition to this, some privileges as to licenses, &c., were accorded, which would perhaps add another £1,500 to the award.

Now suppose the claimant, either from fear of the cost or of the uncertain issue of an arbitration, or for other reasons, had accepted the sum declared by the valuers for the company to be a proper compensation, he would have lost about £9,316, assessed by a jury as fairly due to him over and above the sum at which the company estimated the fair and proper value of the premises.

What is the moral? It is this. That so long as exaggerated estimates on both sides prevail, there is nothing for it but an independent tribunal capable of examining into merits and demerits, and finally awarding such a sum as the case warrants. The remarkable differences in the estimates of valuers would be less frequent if companies would instruct their witnesses to give fair and liberal valuations, and if claimants would be less exorbitant in their demands. An arbitration court would be respected, the profession would be benefited and not ridiculed, as it often is, and there would be less of dividing by two between the highest and the lowest estimates. It is well worth the attention of the profession to assist in restoring the dignity and value of arbitration courts by their firm consistency whether they be acting for a claimant or for a public company.—We are, &c.,

B. B.

"RESTORATION" AT ST. ALBAN'S AND NEW COLLEGE.

SIR,—The new high-pitched roof at St. Alban's is now nearly finished, and nothing more needs be said about it. I had a half-hour to spare on Saturday last, and seeing the scaffolding extend along the whole of the south side of the nave of the Abbey, I thought I would avail myself of the opportunity of mounting to take a few accurate dimensions and particulars of the old brick corbel-tabling which ran along the eastern bays, and of which I had been able to take only an approximate sketch from the transept roof on a former occasion. This corbel-tabling was an unusually interesting feature architecturally and historically. It was constructed of the old Norman-Roman brick, and was apparently of the Norman period, surmounted with a Mediæval string-course, placed there when the parapet superseded the old Norman over-hanging eaves-course. It corresponds in character and workmanship with the clerestory windows in these bays. It had a character of its own of picturesque simplicity; and even supposing it to have been of later date —which is well-nigh impossible—it accorded well with the work of the clerestory and of the tower. To my dismay, I found the stonemason cleaning off a brand-new corbel table of the whole length of the building. The last connecting-link between the old and the new work having thus been taken away, some notification of the fact ought to be recorded, some protest ought to be raised, some explanation ought to be afforded to the outside world, howsoever well those locally interested may rest content to sacrifice this transmission of their sacred trust. Where is the great dictator who has so long watched over the interests of art in general, of architects in particular, and of St. Alban's in person, that such things are being done in open day upon this great national monument? Even the zealous watch-dogs, who are ever turning a tender and jealous eye towards the lambs of the flock, pay little regard to the depredations of the wolf.

As to what has been done at New College, it may seem ungrateful to make any reflection upon the truly noble work carried out in a most generous spirit by the present representatives of William of Wykeham's noble foundation, or upon the work of one, now passed from us, whose whole life was given to the pursuit of the highest forms of art, and to the successful study of our own indigenous architecture. I cannot, however, conceal my disappointment and distress when, in approaching New College from the west, some months ago, I saw the high-pitched lines of the new roof rising above the parapet of the old gable. Nor was I by any means reassured on entering the building. The unsatisfactory and inharmonious space between the top of the old reredos, and the underside of the roof pointed painfully to the divergence from the original lines of the great Mediæval architect. There seems no reason for supposing the chapel ever to have been finished with a higher roof than that of the existing gables, whilst all the evidences, within as well as without, point conclusively to its having been finished with the lower pitch. Supposing this departure from the old lines to be a legitimate restoration, the slope of the gable externally ought unquestionably to have been altered to follow it.

Public and architectural interest must necessarily be centred in St. Alban's, rather than in the later and more limited foundation at Oxford. In some respects I am more immediately concerned in the latter, claiming as I do kinship to its noble founder, and being interested in it by many personal ties and associations; and under the present state of the controversy between restoration and conservation, I cannot refrain from expressing an opinion upon the matter. It is said to have been presented as a mere matter of choice between a simpler form of treatment—one probably in nearer accordance with the original—and the more ornate form which has been carried out. Those who have been instrumental in choosing and carrying out that which was represented to them as the best, can have no cause to reproach themselves with the result, although this result may present a lesson by no means useless to those who are ever striving after, though rarely attaining to, the right; and, in spite of this, Wykehamists may still rejoice in having effected dutifully and conscientiously one of the finest restorations of modern times.—I am, &c.,

WILLIAM WHITE, F.S.A.

Wimpole-street, W.

BOOTLE TOWN HALL COMPETITION.

SIR,—The only intelligence we have obtained as to the result of the competition for the Bootle Town Hall appeared in the columns of the BUILDING NEWS on October 18th, when it was stated that nine sets of designs had been selected out of the total number of competitors, and that an architect was to be called in to place them in their order of merit.

The premiums were to be awarded to the first and second, but if a tender could not be obtained by the first selected for the execution of his designs for the sum of £6,000, then his plans were to be set aside, and the author of the designs second in order was to obtain a tender in a similar manner.

In case he should fail to keep within the required sum, then other designs were to supersede, and the same treatment brought to bear upon them.

The general opinion, and that of the architect called in to criticise the plans, is, that not one of the designs can be carried out for £6,000; therefore all the competitors have an interest at stake, and, in common courtesy, should have been supplied at least with the name of the successful architect, if not with the first nine selected.

The competitors are evidently so numerous that it has been found necessary to send round a printed circular announcing the return of the plans which have been unsuccessful, but without further comment. It would have afforded us some satisfaction if a report upon the designs had appeared in your columns, but the ominous silence that has enveloped the Bootle town-hall competition is to us, as, no doubt, to others, extremely distasteful.

The many complaints and evils attending competitions generally might well be discussed by the members of the Royal Institute of British Architects during the ensuing season, and a remedy proposed. Although some of its members are opposed to the system altogether, yet others are obliged to follow the rounds of the ladder by which they themselves have attained their present eminence.—We are, &c.,

One of the Competitors.

ST. MARY'S CHURCH COMPETITION, WOOLWICH.

Sir,—As an article appeared in your last week's number criticising the designs sent in in competition for rebuilding St. Mary's Church, Woolwich, I trust you will, in justice to the rejected competitors, allow me to lay the facts of the competition before your readers.

The committee invited seven architects to submit sketches, drawn to an "eighth scale," for a church "to accommodate 1,000 persons," the cost "not to exceed £12,000." Three of the architects invited declined, and eventually designs were sent in by the remaining four. Of the merits of these, the public of Woolwich had a fair opportunity of judging after the selection was made, as the drawings were exhibited in the town-hall for two days, and I admit that opinion was generally in favour of the design by Mr. Brooks.

But, Sir, the public were ignorant of the conditions laid down for the competition, and, of course, of the manner in which they were fulfilled by the designs; and what I, as a competitor, complain of (and what, in my opinion, intimately concerns all competing architects) is, that Mr. Brooks appears to have obtained his success by violating all the conditions given us. His designs were drawn to a three-sixteenth scale, his accommodation is for, at most, 850, and his estimate, as publicly announced, is £15,000.

Believing that the committee have exceeded their powers in making the selection they have, I have protested against their decision.—I am, &c.,

Thomas N. Laslett.

37, Walbrook, E.C., Oct. 30.

IS SEWER-GAS POISONOUS?

Sir,—In the last issue of your valuable paper, and at the end of a short report upon a paper read by me, on Thursday last, at the Sanitary Congress meeting at Croydon, you stated that a question was asked of me and remained unreplied to. The question was. "How, if sewer-gas was so poisonous, as I appeared to think by my elaborate provisions against its entrance into a house, I could account for the fact that men who worked in the sewers looked ordinarily healthy and lived as long as most people?"

I beg to say that the query needed no answer from me, because it was most satisfactorily replied to by Professor De Chaumont, of Netley Hospital. His remarks went to this effect: that the evil effects of sewer-gas, or sewer-air, were well known; that it gave rise to, or aggravated numerous diseases; that it produced, for instance, ophthalmia, of which he had had experience in his own regiment; that it rendered surgical operations dangerous, and all wounds and sores difficult to treat, and that it gave rise to erysipelas; that it was dangerous in many, if not in all diseases, and that it had a very serious effect in specific disease; and this, independent of its action as a carrier of specific disease poison. Dr. De Chaumont further said that the opinion that sewer-men are healthy is chiefly based upon the observations of Parent-Duchâtelet in Paris, and in the case of the sewer-men in London. As regards the latter, they work in well-ventilated sewers, when the sewage is in high dilution, and where there is really no smell. He also stated that he had visited the Brussels sewer without detecting any smell to speak of. As regards Parent-Duchâtelet's observations, even from his own statement, the men were not very healthy, for they suffered from fever, rheumatism, and ophthalmia, &c.

I did not attempt to further occupy the valuable time of the meeting by any confirmation of the learned Professor's remarks, because it would have been not only a matter of supererogation, but of almost impertinence on my part. I will only now add that, in my opinion, the sewers of London possess almost a healthy atmosphere compared with the house-drains, and I am sure that I shall be sustained in my opinion by every sanitary engineer. The first thing that salutes one upon opening up a house-drain which is hampered by traps and without ventilation, as a rule, is a most horrible smell, the like of which is never encountered in a sewer; and this is the chief factor in engendering disease, loaded as the air is with various impurities and germs of mischief.

I have on several occasions suffered from the effects of blood-poisoning, brought about by the inhalation of the air present in a house-drain, and suffered very seriously too, and I have seen instances in which it was dangerous to go near a newly-opened drain with a light, owing to the presence of inflammable gas, generated in a cesspool. I would willingly occupy a little more of your space with examples of the danger of sewer-air (or drain-air) in the house-drains, but I am only anxious now to explain the reason why Mr. Symons' question was not replied to by me.—I am, &c.,

W. Eassie.

11, Argyll-street, London, W., October 28.

Intercommunication.

QUESTIONS.

[5925.]—**Roof Flashing.**—The adjoining property to the one which I am erecting being higher, I want to know if I can flash the ends of my roof. Of course, the flashings would have to go in the adjoining owner's walls. Can they stop me from doing so?—X. W.

[5926.]—**Plasterers' Measurement.**—The walls of my house are 2ft. thick. Can the plasterer, in addition to being paid for openings, charge for the splays from window frames to inside wall, which are 15in. wide by the height?—X. W.

[5927.]—**Architects' Responsibility for Smoky Chimney.**—I am called upon by a client to cure a smoky chimney at my own expense in a gardener's house, which has been built from my designs. The chimney is an ordinary exterior one, no peculiarities about it in design. Is it one of the many duties of an architect to guarantee that all houses which he designs shall be free from smoky chimneys during any weather, and is he responsible for the failure thereof?—An A.R.I.B.A.

[5928.]—**Land.**—In measuring land let on building leases by the acre in the country, is it customary to measure sloping land horizontally by level measurements, or to follow the slope of the land?—Surveyor.

[5929.]—**Ventilation.**—I should feel greatly obliged if "G. H. G." or some other competent reader of your journal would kindly inform me as to the best means of ventilating dwelling rooms—*e.g.*, dining, drawing, and bedrooms; public rooms such as school-rooms, lecture-halls, class-rooms, chapels, &c. In what way does a fire in a room tend to purify it? I have heard it said that a room with a fire is more likely to have pure air, though full of people, than a room that has no fire. A little information on these matters will greatly oblige. Has there been an article published recently in the Building News on "Ventilation," and in what number?—Phiz.

[5930.]—**Architect and Client.**—A. engages B. to prepare plans, specifications, and get in tenders for villa. When lowest tenders are summed up A. thinks the amount too large. Differences arise, and A. asks B. for his account for the plans which he wants. What can B. legally charge for work done? B. bargained to carry the work out at 2 per cent.—Phiz.

[5931.]—**Quantities.**—Will some one who has had a case similar to the following kindly give me his opinion? I am architect for a building and am requested by the proprietor to take out quantities, for which he agrees. I shall be paid by contractors 2 per cent. out of first instalment in the ordinary way. The tenders being higher than proprietor expected, and for other reasons, he decides not to build. He refuses to pay my bill for the quantities, asserting that the agreement was that the contractor should pay me. It seems pretty clear to me that proprietor is liable, but I should like to have my opinion strengthened by some one who has experienced a similar case.—D. M.

[5932.]—**Abbeys of Yorkshire.**—Would the Rev. Mackenzie E. C. Walcott, B.D., or other valued contributor, kindly inform me where I could obtain the best information upon the origin and development of the Cistercian Abbeys of Yorkshire? I wish to write and deliver a lecture early next year upon the subject, treating fully of the architecture, the customs of the founders, and the influence exerted by them upon the literature and arts of the period during which they flourished, with the causes which led to their downfall. I wish particularly also to illustrate (by the magic lantern) photographic views of the ruins at present existing, with plans showing, as far as possible, the original extent and arrangement of the conventual buildings. Any drawings showing ideal restorations would be esteemed and valued, and would be carefully returned after a photographic transparency had been obtained.—Fountains.

[5933.]—**Pulley with Curved Arms.**—I should feel much obliged if you would ask, through the medium of the Building News, whether one of its numerous readers could tell me of a formula to draw a pulley with curved arms, so that each arm makes a complete S.—Amateur Draughtsman.

[5934.]—**Testing Portland Cement.**—I am anxious to know the best method of testing Portland cement. Will some reader inform me how this is done?—O. L.

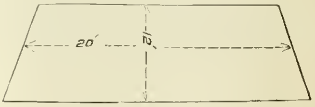
[5935.]—**Analysis of Zinc.**—Will some one kindly give a scheme for the accurate quantitative analysis of a sample of commercial zinc, containing about one per cent. each of lead, tin, and iron, together with small quantities or traces of mercury, arsenic, antimony, and sulphur? I have tried many methods, but none with perfect success.—An Erring Brother.

[5936.]—**Hardening Plaster of Paris.**—Would any reader kindly inform me how I can make plaster of Paris very hard and strong; I do not care what colour it is. I have seen some which has been turned and polished; it is quite as hard and nearly as strong as wood.—H. P.

[5937.]—**Pottery.**—An amateur has a seam of brick clay and marl which burns a red colour, and is anxious to produce a glazed article for fancy goods. Can you say best process? Also, if blue goods could be produced from the same clay by any means?—R. Knight.

REPLIES.

[5903.]—**Measuring Slating.**—There is great diversity in different localities as to measuring slating. The following seems the correct method. As regards the allowance for eaves, unless a smaller size slate is specified for the undercourse to eaves, the actual waste in cutting down slate for undercourse should be added. In case of smaller sized slate being used for undercourse no extra measurement is allowed. The actual waste in cutting to hips and valleys should to taken in like manner, according to size of slate specified and pitch of roof.—Stat Nominis Umbra.



[5907.]—**Damp.**—I am much obliged for the several replies to my query as above, but the point I wish to clear up has been mainly missed. Perhaps I did not express myself clearly. I rather desired to know if the indications of excessive moisture were owing to dampness in the walls and structure of house or from the foundations, as I could find no signs on close examination, it being the fixed and essential damp of the house that I feared. Possibly moisture might be from the outside and therefore of no more account than the general atmosphere of the locality. —B.

[5916.]—**Levels of Sewer Inverts.**—I beg to call your attention to several printer's errors in the answer sent by me last week, thus—For "boning rods" it reads "boring rods," and "tenth" for "length," and "hard level" for "hand level." A practical person would see the errors, but an amateur would not.—A. Lewis.

STATUES, MEMORIALS, &c.

Monument to Dean Ramsay.—The memorial cross which is to be erected on the inclosed ground to the east of St. John's Episcopal Church, Princes-street, Edinburgh, was uncovered on Monday. The cross has been executed by Messrs. Farmer and Brindley, London, from drawings by Mr. R. Anderson, architect, A.R.S.A. The cross, which is formed of granite, rises to the height of 26ft. from the ground—the width of the arms being 8ft. 6in. On each of the main faces it is divided into panels, in which is inserted bronze bas-reliefs. Those occupying the head and arms of the cross represent the various stages of the Passion, together with the Resurrection and Ascension; and in another series of six, placed three on either face of the shaft, are set forth the Acts of Charity. Large panels at the foot of the shaft are filled in with sculptured ornament of twelfth-century type. In the same style have been treated the bronzes for the small panels formed along the sides of the cross, as well as the stonework of the circle connecting the arms.

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A new organ, erected by Messrs. Brindley and Foster, of Sheffield, has just been placed in Eyam Church, Derbyshire.

Our Office Table.

The building trade in New York seems to be looking up. There has been a marked increase in the number and value of the buildings constructed in that city during the past eight months over the corresponding period last year. The Superintendent of the Department of Buildings gives the statistics as follows: First eight months of 1879—Number of buildings constructed, 1,450; cost of construction, 16,351,512 dols. First eight months of 1878—Number of buildings constructed, 1,128; cost of construction, 10,707,200 dols. Increase in number of buildings constructed, 322; increase in cost of construction, 5,644,312 dols.

The Cathedral of Bâle has been allowed by neglect to sink into such a state that fears are entertained for its stability. The architect, M. Reese, declares that if some imperative repairs are not executed immediately, some of the statues and other outer ornaments will come tumbling on the passers-by. A committee has been formed for effecting a restoration of the cathedral, and for collecting funds for the purpose. It is estimated that at least 250,000 francs (£10,000) will be required for the necessary external repairs alone. It is proposed to spread the work over several years.

In a foot-note to an enthusiastic sonnet, written after revisiting Aberdeen, which appears in the *Scotsman*, Professor John Stuart Blackie remarks:—"It is an old and well-known joke against the granite capital of the north, that whereas, before the building of the Denburn Bridge, it was a town without an entrance, after that splendid erection it became an entrance without a town. Something of the point of that sarcasm may, perhaps, still remain (for King-street has not in any wise fulfilled its early promise); but it is a grand thing to have one first-rate street; for purposes of architectural display, Berlin and Edinburgh have really no more; and the style and scope of Union-street, in Aberdeen, is really so imposing that a stranger may well look upon it as an ample compensation for a whole dozen of streets of commonplace respectability. The number of lofty and graceful spires along the line of this street has now broken in with emphatic effect upon the somewhat bold and formal line of the original street; but the finishing stroke has been given to its æsthetic excellence by the new Town Hall buildings, which, for a rare combination of mass and grace, in perfect harmony with the noble material, in my opinion deserve to be ranked with the most notable structures of that kind in Italy, Germany, and Belgium. The architectural design of this building reflects the highest honour on Mr. Peddie."

Messrs. W. Lewis and Son, architects, Stonegate, York, have just been intrusted with the carrying out of the designs for a new church and clergyman's detached residence for the Rev. B. Rabinat, Trinidad Island, the novelty consisting in the fact that the whole will be built in England, taken apart, and shipped to Trinidad. The church, which will be built of the best yellow pitch-pine, and varnished throughout, is in the Tudor style, and will accommodate 400 people. It has nave, aisles, chancel, two entrances, porches, and two vestries; also organ chancel, with two galleries over aisles. The nave roof is surmounted by an octagonal spire forming belfry. The church will be glazed with cathedral glass in quarries, no lead being used. The covering of the roofs will be of corrugated iron, laid on inodorous felt, and secured with dressed pitch-pine boarding. The residence is treated with similar materials, and the rooms are conveniently arranged. Running along the front exterior is an open covered gallery, communicating with the various rooms.

At the Mechanics' Institute, Plymouth, on Friday evening, Mr. W. T. Douglas, C.E., who was introduced to the audience by the Mayor as a member of a family who for three generations have been engaged in lighthouse building, delivered a lecture on "Rock Lighthouses," with special reference to the new one on the Eddystone, which is in course of erection under his supervision. Mr. Douglas described Winstanley's and Rudyerd's structures which preceded Smeaton's, afterwards contrasting the dimensions and constructional principles embodied in the existing lighthouse with those of the edifice now being erected. Incidentally he remarked that already a hundred stones, each weighing about three tons, have been landed on the reef, that 13ft. of the base have been constructed, and that the engineers expected, at the rate of progress they were making, to complete the undertaking within five years from its commencement. Answering questions put by the audience, Mr. Douglas stated that it was contemplated that the new Eddystone lighthouse should be lighted by electricity, but the Trinity Board had not yet come to any decision on the point. To erect a new structure would be infinitely less costly than to remove the reef itself. Suggestions to this effect had been made to the Trinity Board, but he thought they had adopted a better course. In the first place, the light was of value to vessels, as it marked the entrance to Plymouth Sound, and then the house could be built for about £70,000, whilst to remove the rock it would be necessary to blow away two million tons of reef, and the cost would probably amount to a million of money. The intention of the Trinity Board with relation to the old lighthouse was to pull it down to a certain level, but if some enterprising Plymouth gentlemen were prepared to spend £5,000 or £6,000 in re-erecting it on the Hoe, or any other place, he did not know that there would be any objection, but he was certain that the Trinity Board would not find the money. There would be next to no expense incurred in pulling it down; the cost would be involved in transferring the material to land and setting it up again. The difficulty would not be one of engineering, but simply of expense.

Messrs. Leyland and Son, of Halifax, announce their intention of publishing in December a work entitled "Views of Ancient Buildings," illustrative of the domestic architecture of the parish of Halifax, by John Leyland. The work will consist of twenty-five views of the exteriors and interiors of buildings within the parish, not hitherto published, with an introduction and list of subscribers. Its size will be oblong folio (16in. by 13in.), uniform with Mr. Horner's "Buildings in the Town and Parish of Halifax," published by them in 1835. Views of the following buildings, with others, will appear:—Barkisland: Barkisland Hall. Elland: Interior of New Hall. Erringden: Great House. Greetland: Clay House—Sunny Bank from the N.W. Halifax: Mulcture Hall, (as it was)—Swan Inn and adjacent houses (now destroyed)—Ancient Building, Old Market (restored). Midgley: Kershaw House—Broadfold (now destroyed)—Interior of Brearley Hall (restored). Norland: Binroyde—Norland Hall. Southowram: Shibden Hall, from the Courtyard—Ancient House in the Park. Sowerby: Hollinhey—Interior of upper room, Bentley Royd. Soyland: Swift Place.

M. Folbacci, according to *Ann. du Génie Civil*, uses the following preparation for rendering wood incombustible and impermeable:—Sulphate of zinc 55lb., potash 22lb., alum 44lb., oxide of manganese 22lb., sulphuric acid of 60° 22lb., water 55lb. All the solid ingredients are put into a boiler containing the water at 45° C. (113° F.), and as soon as they are dissolved the sulphuric acid is poured in gradually until the mass is completely saturated. The pieces of wood are kept about 5 centimetres (1·97in.) apart, and after three hours' boiling they are dried in the open air. The natural appearance of the wood is not changed; to whatever heat it is subjected it resists combustion, the surface being simply covered with a thin charred coating, which is easily rubbed off.

In answer to inquiries in these columns and elsewhere, the Rev. Basil Edwards has received notices and descriptions of several very fine oaks. Of these the Cowthorpe oak, Yorkshire, seems to be regarded by many of his correspondents as the largest oak in Britain. Its measurements, as furnished to him by the Rector of Cowthorpe, are—at the ground, 55ft. 6in.; 5ft. above the ground; 38ft. 4½in. Those of the Newland oak are—at the ground, 46ft., and 5ft. from the ground its girth is 47ft. 6in. Opinions may differ as to which of these fine trees is the larger, but Mr. Edwards submits that a tree which measures 47ft. 6in. at a height of 5ft. from the ground is a larger tree than one which measures even 56ft. close to the ground, where it is unavoidable to take the roots or some part of them into the measurement. It may interest our readers to know that the Newland oak, which from the above measurement seems to be the largest in the country, is mentioned in "Domesday Book" as a large tree in the new lands at that time cleared. This, allowing for the slow growth of oaks, will give it an age probably not inferior to its Yorkshire or any other competitor.

Lord Carnarvon distributed the prizes to the students at the Art School of Winchester on Tuesday. He traced some of the effects and tendencies of modern art culture, among which he prominently remarked that manual workers were forsaking the country for the towns in the search for higher avocations. Lord Carnarvon regretted that while our national taste had improved with marked rapidity, the quality which partially compensated for our former deficiency in this respect seemed to be declining, for the charges that the soundness of our workmanship was departing were frequent and loud.

The session of the Leeds Architectural Association was opened last (Thursday) evening by the delivery of the presidential address and the presentation of the annual report. The following are the items of the programme:—Nov. 13th, "The Historical Relationship between Art and Religion," by Mr. J. W. Connor; Dec. 2nd, a conversazione; Jan. 15th, "Art in the Conservatory and Greenhouse" (with illustrations), by Mr. Maurice B. Adams, A.R.I.B.A., London; Jan. 29th, "Our Profession," by Mr. G. B. Bulmer; Feb. 12th, "Art in Italy under the Romans and during the period of the Renaissance" (with illustrations), by Mr. J. V. Appleyard; Feb. 26th, "On Contractors' Work," by Mr. J. K. Osborne; March 11th, "The Beautifying of Towns," by Mr. F. L. Somerville, of Manchester; April 1st, members' soirée; April 15th, "Notes on some of the Ancient Historical Houses of Old Edinburgh" (with illustrations), by Major R. W. Moore; and April 29th, "Architectural Rambles on the Continent" (with illustrations), by Mr. J. Tweeddle.

We notice that Messrs. Wright, Sutcliffe, and Son, of Halifax, in addition to the medals they have already gained at Vienna 1873, Leeds 1875, Manchester 1875, and Paris 1878, have again been awarded a medal at the York Exhibition for their specialities in bath, toilet, and other hot-water fittings for baths and lavatories. The above firm are the only makers in England of the American double combined hot and cold-water taps for baths and lavatories, complete with shampoo, and were the first in England to make cast-lead traps in two halves, but are now making them in whole ones as well as in two halves.

Seven years ago, the Ontario Society of Artists exhibited a collection of their pictures in Toronto, which proved so popular both in respect to the number of visitors and of pictures sold that the annual exhibition of the society has grown into an institution. The stimulus thus given to the pursuit of art as a profession led to the establishment of an Art School in that city a few years ago. Now Ottawa has followed the example of Toronto, and established an Art School, in which the Governor-General and Princess Louise are taking the greatest interest. The Princess has undertaken to select a competent instructor for it during her present visit to this country.

The Rev. Arthur Hall informs us that the committee of the St. Pancras Workmen's Exhibition have decided to hold another exhibition next October. It will be open to all residents within the metropolitan district, but will be restricted to exhibits completed or made during the twelve months preceding October, 1880—a wise decision. The exhibition will be held in Tolmers-square Institute, Drummond-street N.W., and intending exhibitors should send in their names as soon as possible to Mr. Meech, the hon. secretary, 17, Harrington-street, N.W. It is hoped that this proposal will stimulate many workmen during the winter months to make and exhibit articles which will be of pecuniary benefit to the exhibitors, as every facility will be afforded to them to sell the articles if purchasers are forthcoming. It should be specially added that the exhibition is "open to all within the metropolitan district"—a fact which does not appear to have been previously understood.

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Lamplough's Pyretic Saline is Refreshing, most agreeable, and the preventive of Fevers, Biliousness, Smallpox, Skin Diseases, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—Advt.

CHIPS.

The All Saints' burial board, Horsham, met on Monday to complete the purchase of land for a cemetery from the Duke of Norfolk, at £30 per acre, and at the same meeting approved plans, estimated to cost £175 in execution, for fencing-in and laying out the ground. These plans were prepared by Mr. Skinner, surveyor to the board.

At a meeting of the promoters of the proposed new line of railway to connect the mineral district of Rhondda Valley with the harbour of Port Talbot, held on Saturday, it was unanimously decided to apply for Parliamentary powers to carry out the work, and the engineer, Mr. Sydney W. Yockney, M.I.C.E., of London, was instructed to proceed in accordance with this resolution.

An inaugural lecture will be delivered by Prof. W. E. Ayrton to-morrow (Saturday) evening, at the Cowper-street Schools, Finsbury, in connection with the opening of the technical classes established by the City and Guilds Institute. The subject of the lecture will be "The Improvements Science can effect in our Trades and in the Condition of our Workmen."

The latest testing of the Manchester stoves at the London Temperance Hospital, Hampstead-road, N., London, is as follows:—Time 6 p.m., date Oct. 27, 1879. Doors and windows closed. Temperature of outer air 45° Fahr., inflow of warm air into wards, generated by the Manchester stoves, 135° Fahr. Uniform temperature of wards 68° Fahr. Force of current of warm air into wards of such power that it passed through the wards into the staircases, warming them also in its exit, to the external atmosphere.

The Corporation have unanimously appointed Mr. Clement Dunscombe, M.A., C.E. (borough engineer of Derby), borough engineer of Liverpool, at a salary of £800 per annum. There were 101 candidates for the office.

A new monthly, the *Antiquary*, is about to be started by Mr. Edward Walford, who proposes to lay it down in the original lines of the *Gentleman's Magazine*. The first number is to appear on Dec. 20.

A new infant-school for the parish of Cliffe, Mid-Kent, was opened on Wednesday week. It has been built by Messrs. Callund and Son, of Rochester, from the designs of Mr. G. Ruck, of Maidstone. It accommodates 150 children, and has cost £900.

The town council of Burton-on-Trent received on Thursday last a report from Mr. J. Mansergh, C.E., of Westminster, on the sewerage of the borough, with a scheme for treating the sewage.

In the course of excavations for new buildings about to be erected in Carfax-square, Horsham, from the designs of Mr. E. Burstow, of that town, two ancient pitchers of baked clay were found 8ft. below the surface.

Holloway's Pills have many competitors, though no equals, for supplying the young and delicate with a simple, strengthening, and purifying aperient. These Pills, composed of the finest Balsams, are particularly adapted for all complaints peculiar to females, and are most serviceable at the critical periods of early and mature years.—[Advt.]

MEETINGS FOR THE ENSUING WEEK.

Saturday.—Cowper-street Schools, Finsbury. Lectura by Prof. Ayrton to City and Guilds Institute. 8 p.m.

Monday.—Society of Engineers. Paper by Wilkinson Jones on "Modern Tramway Construction." 7.30 p.m.

Thursday.—Builders' Benevolent Institution, 32nd anniversary. Dinner at the Freemason's Tavern. 5 for 5.30 p.m.

HELLIWELL'S Patented NEW SYSTEM
IMPERISHABLE GLAZING WITHOUT PUTTY.
As ADOPTED by H.R.H. the PRINCE of WALES at Sandringham.
All Woodwork is covered, and no outside Painting is required. Old Roofs Re-glazed. Any one can repair or take in pieces.
See half-page Advt. in next Number.
T. W. HELLIWELL, Brighouse, Yorkshire; or, 19, Parliament-street, London.—[Advt.]

Trade News.

WAGES MOVEMENTS.

Blackburn.—The operative plumbers of Blackburn struck work on Tuesday against a reduction of their wages of 1d. per hour.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
Agent: Mr. E. Crickmay, 4, Agar-street, London, W.C.—[Advt.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information. Full addresses are not wanted—simply the names of the towns.

Anerley, S.E.—For the erection of dwelling houses in Elmers End-road, for J. Jemini, Esq. Mr. St. John Hancock, architect, 5, Furnival's Inn:—

Palmer	£2,996	0	0 !
Wooton	2,297	0	0
Young*	1,715	0	0
Stoneham	1,597	0	0 !

* Subsequently modified and accepted.

Battersea, S.W.—For the enlargement of the school in Gideon-road, Battersea, by 400 places, for the London School Board:—

Williams, G. S. S. and Son	£5,172	0	0
Lathey, Bros.	5,150	0	0
Wall, Bros.	4,811	0	0
Kirk and Randall	4,642	0	0
Jerrard, S. J.	4,477	0	0
Marsland, J.	4,397	0	0
Thompson, J.	4,384	0	0
Higgs and Hill	4,284	0	0
Tyerman, J., of Walworth*	4,139	0	0

* Recommended for acceptance, £300 for provisions.

[Cost of school buildings only (including provisions), £3,616; for special expenses, properly chargeable to site, viz., (*a*) provisions for carrying on school during progress of work, £60; (*b*) additional hand carriage of materials to and from site, £130; (*c*) connecting with existing building at two points, £190; (*d*) raising new rooms on arches, £113; (*e*) levelling land for playground, £200; (*f*) extra deep foundations, £130; total cost, £4,439. Cost per head of enlargement, £11 1s. 11d.]

Bilston.—For constructing sewers at Hallifield, for the Bilston Township Commissioners:—

Darby, T., of Coscley (accepted)	£150	0	0

[Four tenders received.]

Blackburn.—For the erection of two dwelling houses, for Mr. Thomas Bordby. Mr. Angelo W. R. Simpson, architect, Blackburn. Quantities by the architect:—

Accepted tenders:—

Mason (exclusive of allowance for old material):—			
Hindle, C.	£144	10	0
Carpenter and joiner:—			
Roberts, E.	238	0	0
Bricksetter:—			
Gillibrand, W. and J.	153	0	0
Flagger and slater:—			
Maudsly, D.	88	4	0
Plumber and glazier:—			
Chadburn, J.	57	0	0
Plasterer:—			
Standen, T.	55	0	0
Painter:—			
Garstang, L.	9	15	0
	745	9	0

[Chimneypieces, grates, kitchen-ranges, &c., £43.]

Bournemouth.—For a cast-iron sewer outfall. Mr. G. R. Andrews, surveyor:—

Saunders & White, Bournemouth	£3,938	0	0
Hill and Co., Gosport	3,627	0	0
Howell, E., Poole	3,615	0	0
Pontifex and Wood, London*	2,920	0	0

* Accepted.

(Surveyor's estimate, £3,406.)

Derby.—For the completion of streets and construction of sewers in Derby, for the Derby Urban Sanitary Authority. Mr. Clement Dunscombe, C.E., borough engineer:—

No. 1.	£2,062	0	0
" 2.	1,692	0	0
Tomlinson, J. and G. (accepted)	1,553	10	0

Derby.—For covering over last section of Markeaton Brook Course, from Sadler Gate Bridge to St. James-street, for the Derby Urban Sanitary Authority. Mr. Clement Dunscombe, C.E., borough engineer:—

No. 1.	£3,445	0	0
" 2.	3,108	0	0
" 3.	1,837	2	6
" 4.	1,814	19	10
" 5.	1,677	12	8
" 6.	1,650	0	0
" 7.	1,580	0	0
" 8.	1,497	5	0
Bromage, T. (accepted)	1,435	0	0

Derby.—For building inspector's residence, horse-keeper's cottage, boundary walling, and entrance gates to Central Depôt, Ford-street. Contract No. 2. Mr. Clement Dunscombe, C.E., Corporation surveyor:—

No. 1.	£1,530	0	0
" 2.	1,519	2	6
" 3.	1,410	0	0
Hall, T. J. (accepted)	1,105	11	11

Derby.—For cleaning and painting Market Hall and Butter Market. Mr. Clement Dunscombe, C.E., Corporation surveyor. Quantities supplied:—

No. 1.	£825	0	0
" 2.	564	10	0
" 3.	558	15	0
" 4.	528	10	0
" 5.	491	0	0
" 6.	490	0	0
" 7.	469	0	0
" 8.	451	0	0
" 9.	388	5	6½
Smith and Walker (accepted)	375	0	0

Hastings.—For rebuilding business premises at 52, Robertson-street, Hastings, for Edwin Plummer, Esq. Messrs. Cross and Wells, architets:—

Wood, J.	£3,290	0	0
Harmer, C. and E.	3,290	0	0
Jenkins	3,282	0	0
Rodda	3,260	0	0
Jones, Gloucester	2,854	0	0
Geary	2,795	0	0
Womersley, A. D.	2,780	0	0
Coussens, W.	2,749	0	0
Cruttenden, F.	2,730	0	0
Vidler, A. (accepted)	2,648	0	0

J. & E. HALL
(ESTABLISHED 1785),
ENGINEERS, MILLWRIGHTS,
Founders, and Boiler Makers,
Works:—DARTFORD, KENT.
London Offices—21, St. Swithin's-lane, E.C.

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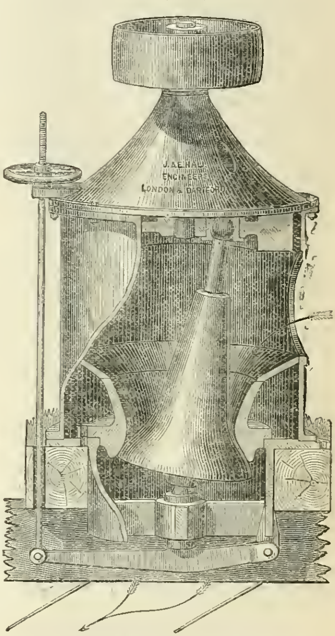
UNIVERSAL CRUSHER.
THE SIMPLE PESTLE AND MORTAR ADAPTED AS A MACHINE.



Hand and power Machines with Mortars, of from 5¼in. to 30in. diameter,

These Crushers are the most effective and economical Machines known for reducing the hardest materials, as Emery, Granite, Quartz, Glass, Flints, Cement Clinkers, Pyrites, and the like, from any size down to the finest powder.

They will also be found very useful in a Laboratory for grinding, bruising, or mixing drugs and colours of every description.

The facility with which these Machines are regulated to deliver the ground material, now at one size and then at another, forms one of its chief attractions.

Prices and all Particulars upon Application.

HART'S PATENT
CYCLIC ELEVATOR.
For which see Advertisement each alternate insertion.

EDGE-RUNNER MORTAR MILLS,
In specially hard Cast Iron, outlasting several of the ordinary description.

ESTIMATES FURNISHED FOR
CEMENT & BRICKWORKS MACHINERY,
Complete with the latest improvements, together with the best practice for laying out the works for strict economy.

Engines, Boilers, Castings, and Engineers' Work in General.

THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 7, 1879.

THE HERNE HILL MISSION CHURCH COMPETITION.

ANOTHER instance of the effrontery and want of courtesy practised by those who advertise for competition designs has just been brought to our notice. In July last an advertisment appeared in our pages, signed by a suburban vicar, inviting architects to compete for the erection of a Mission Church on the Milkwood Estate, Loughborough, S.E., to accommodate from 300 to 400 people, and asking intending competitors to send their names to the Vicar of St. Paul's, Herne Hill. Out of this number, a limited number of candidates were selected to send in designs, and printed instructions were issued, the leading condition of which was that the church was to be built in accordance with the rules of the Incorporated Church Building Society for a *permanent Church*, the words in italics being underscored. The building when complete was to accommodate not less than 400, and the portion proposed to be first erected to provide not less than 300; the plans were to show the completed building, defining the part to be first built, and the means proposed to enclose the uncompleted sides. Another clause desired that a part of the site, which was triangular, should be reserved for a Sunday-school or Mission Room. The church was to be seated with open benches, partly movable, heating, lighting, and ventilation were to be shown and included in the estimate. A correspondence of a rather interesting and instructive kind followed in our pages, to one of which letters copies were appended of several communications received in answer to the advertisement from applicants actuated by "love for the cause" and other lofty motives. Our readers may refresh their memories by turning to the letter signed "W. H. P." in our issue of August 15th last. One of the applications was written by a member of the Institute, in which the writer promised if successful to "*return* half the commission as a donation to the funds," while another applicant described himself as a Gold Medallist of the Royal Academy of Arts. We need not stay to remark now upon the character of this kind of application, as we shall presently have something to say about a proposition in connection with competitions generally, which appears on another page, from a Fellow of the Institute itself. What we desire chiefly to do here is to call attention yet once again to the manner in which competitors are treated, and to ask if such treatment has not tended to bring about the evil that our correspondent and ourselves have deplored. The illicit practices of architects and other professional men are largely due to the laxity of moral principle of those who invite, and the unscrupulous way in which committees and boards have dealt with competitors. But we return to the immediate facts of the case we are citing. In a letter which followed the one we have referred to, "Observer" pointed out the somewhat unusual invitation issued by the Vicar, which had given rise to such discreditable applications, and mentions another fact that the Vicar of St. Paul's was the father of a clever architect—Mr. W. H. Powell, of Mecklenburgh-square. We were glad to admit a subsequent letter into our pages written by the last-named gentleman, disclaiming the idea that Mr. Powell was one of the competitors, and to hear that he had strongly advised the Committee to call in an architect unconnected in every way way with the church to decide the competition. If Mr. Powell's advice had been duly acted upon, the abortive labours of six gentlemen chosen by the Committee to send in designs would have been saved. We are now informed by several of the competitors that the Vicar simply thanks each competitor for the inspection of the plans he has submitted, regretting at the same time that the plans were "too expensive for a mission church and beyond the means at their disposal." Six competitors, or rather five, for one gentleman, Mr. Barber, through press of business, did not send in, have thus been put to an unnecessary amount of labour and expense, the actual value of which it would be difficult to estimate. The names of the gentlemen who have submitted plans are Mr. J. E. K. Cutts, of Southampton-street; Mr. J. Ladds, of Chapel-street, Bedford-row; Mr. W. Penstone and Mr. J. F. Leigh, of Great James-street, Bedford-row; and Mr. Aston Webb, of Duke-street, Adelphi. A careful reading of the "Instructions" to architects has failed to suggest to us any just ground for such a summary dismissal of the designs by the Committee except that the Committee invited architects without a sufficient knowledge of the requirements of a building of the kind they wanted. The first instruction plainly requires a permanent structure built in accordance with the rules of the Incorporated Church Building Society. It these rules had been studied at all by the framers of the instructions, they should have known that it was impossible to design a church in accordance with them for a very low sum. Again, there was no condition as to cost, the only intimation being that the cubical contents of building was to be given, and that the strictest economy had to be observed. If the committee were limited in their means, it would only have been reasonable that they should have said so, or at least fixed a figure as the maximum limit; but nothing of the kind appears in the instructions. It is true one clause, No. 10, states that the Building Committee do not undertake to carry the work into execution, or to order the preparation of the working drawings; but it does not explicitly say, as it might have done, that the committee did not pledge themselves to accept any of the designs; in fact the wording of the clause implies that one design will be accepted, as the clause runs, "No payment will be made to those architects whose plans are not accepted." Some of the competitors complain to us of the want of fairness of the committee in extending the time at the last moment when the bulk of the work was done, and after many of the competitors had worked late at night for some time to get the drawings finished by the period fixed. Mr. Cutts, on receipt of the letter extending the time from the 30th of September to the 14th of October, wrote to point out the injustice of the proceeding, as the extension of time could be of no service to him and others in redrawing or in further elaborating the design at that moment. We should be sorry to say anything to impugn the good faith of those who asked for designs; at the same time we feel that justice has not been done, and that the committee have put five gentlemen of acknowledged ability and experience to an amount of trouble and expense without so much as offering an honorarium to them. With the object of examining for ourselves the grounds upon which the committee have excused themselves from accepting any of the designs submitted, we have taken the trouble to personally inspect some of the designs sent in. Of the four designs we have thus examined there is not one that can be pronounced extravagant in style or treatment, while in two instances they are extremely simple, showing nothing more than a plain roofed structure of the barest description. We cannot conceive what plainer or more inexpensive buildings the committee could have expected than those submitted by Messrs. Ladds and Penstone for instance, while the more finished designs of Mr. J. E. K. Cutts and Mr. Aston Webb are fairly within any reasonable meaning of the "instructions to architects." Taking the design sent in by Mr. J. E. K. Cutts, we have a very simple and effective structure of red brick, the interior walls being faced with the same material. The church on the west side forms the boundary towards Lowden-road, or the longest side of the triangular plot; it is placed with the chancel at the north, while the parochial hall is proposed on the east side, filling up the large angle. The plan shows a nave 72ft. 6in. by 23ft. 10in. in the clear, a chancel 29ft. 3in. long by 23ft., and aisles, the one on the east side being simply a passage way. There is a porch at the entrance end with a font in line with the centre passage, an organ chamber is placed on one side of chancel, and the clergy and choir vestries are planned round the apse, partly filling up the space at the south angle. The nave seats 292, the aisle 92, and the choir and clergy make a total of 412. The parochial hall adjoins the church on the east side of site, and is 50ft. 6in. by 18ft., with the angles canted off and roofed with a high-pitched roof and hipped ends. The author has worked out his design in a thoroughly economical manner, and obtains effect chiefly by a dignified and lofty nave, lighted chiefly by clerestory lancet windows of extreme simplicity. The roof of nave and chancel are on the same level, broken only by a plain slated bell-turret at the separation; the chancel is not too large, and has a convenient passageway left behind the choir seats; and the vestries are conveniently grouped round the chancel. In the construction and internal design nothing can be simpler: the windows are all plain lancets of brick well splayed internally, and the nave arches of five bays each side are also proposed to be executed in plain moulded bricks resting on stone pillars. The roof is framed and open, with tie and collar beam principals, plastered between. We observe that the author proposes to build in a temporary manner the south aisle, the cost of the first portion of the church being estimated at £3,200, and the completion of the aisle £250. Everything is intended in the author's description to be of the plainest possible kind; the stone will be limited to the pillars, and the heating will be by hot air arranged below the west porch.

Mr. Aston Webb has disposed his buildings in the most economical manner upon the site; the church on one side forms the boundary and is placed very nearly east and west. By this arrangement the author obtains the accommodation required without sacrifice of space. The church has a nave of three arches or bays and side aisles of wide span; the latter are canted at the ends to suit the shape of ground, and the proportions give a rather wider plan than usual. The nave is 52ft. by 24ft., by 38ft. high to ridge, with a narthex at the west end and a shallow apsidal-ended chancel. At the west end a flat bell-gable is carried up, forming a simple and inexpensive but effective feature. The clerestory is lighted by dormers, and the author has introduced the plainest kind of windows, without tracery. There is a triplet at the west end, and the whole of the walls are proposed to be faced with red bricks relieved by stone. The cost to complete the design is estimated at £2,900, and the sum to carry out the first portion £2,200—figures that we are sure have not been over-rated. The school or mission-room has been placed at the north angle of the ground.

Mr. Ladds's design is cruciform in plan, and is so arranged that its axis somewhat bisects the acute angle on the north side of the triangular plot, the transepts being made to fit within the two sides. Mr. Ladds dispenses with aisles, and roofs his nave in one span; the transepts are each divided by two arches and are double-gabled externally; the chancel has an apsidal termination, and has a vestry on one side and an organ-chamber on the other side of it. The nave is seated with two rows of seats, and has a centre passageway. At the west end is a narthex and baptistry. The total number of sittings provided by Mr. Ladds's plan is 430, of which number 314 is obtained in the nave without the transepts, which are proposed to be built afterwards. Brick, relieved by stone in the window dressings, &c., is the material intended for the walls which have buttresses, and the windows are all single lights. The author has estimated the cost of his design, when completed with transepts, at £3,450, and without transepts at £2,800. From our inspection of the drawings and the internal construction, we decidedly think the author has over-estimated his design, and we believe the nave and chancel might be well executed at from £1,500 to £1,800 with the materials contemplated, which would be at the rate of nearly £6 per sitting, a very ample price if we take similarly-designed buildings into consideration. Our opinion upon this point is confirmed in looking at the author's very inexpensive features; a shingle turret and spirelet rises from the nave roof. The school-room is placed in one of the acute angles of the plot on the east side.

Mr. Penstone's design is another very effective one, marked by extreme simplicity in its treatment. The church is placed lengthwise along the main side of triangle. There is one aisle on the obtuse-angle side of plot, opening by four bays with segmental-shaped arches into the nave. Both are kept low, and the internal walls are finished in the plainest manner consistent with structural effectiveness. At the end is an apse, which closely fits into the acute angle of the ground, with children's seats and organ-chamber on either side of chancel. Externally, a Late phase of Gothic, verging in the features on Late French, is adopted; the windows are square-headed, relieved by cut brick heads and jambs, with label mouldings of flat ogee form over the aisle windows; the materials are brick with stone, and the nave is relieved by a small but suitable bell-turret, and the whole structure is certainly of a type characteristic of a mission church. The estimate given is £2,352.

From an economical point of view the designs submitted are all within the expectations we formed of them, and we are at a loss to conceive on what plea the labours of these gentlemen have been set aside. If a temporary structure of timber or iron had been contemplated, the committee should have hinted their intention, and not put architects to the cost of competing for a church of a permanent character, and which has cost each of the competitors, at a very moderate calculation, at least £40 to £50. After all, the question raised by the circumstances of the Herne Hill Mission Church is one of considerable concern to the profession, namely, whether architects are to be put to unnecessary labour for the instruction and benefit of any individual or committee who may think themselves justified in advertising for professional information and skill? We are led in connection with this question to discuss a proposal made by Mr. Thomas Porter, F.R.I.B.A., on competitions, whose letter, printed on another page, will, we hope, be read and carefully weighed by all members of the profession. Theoretically we must fairly admit all the evils ascribed to the open competition system Mr. Porter mentions. In the first place, it must be allowed that the profession is not what it used to be before that system was introduced, and that the art has sunk in reputation ever since. Architecture is now far more than it was, a commercial industry, and competition has done much to place the products of the architect's skill on a level with other commodities. The consequences have been fruitful of mischief. The art has been brought to the level of a manufacture; architectural design has passed virtually into the hands of a few experts whose only object is to turn out drawings of exteriors without the slightest regard to structural and architectural principles; feats of draughtsmanship are mistaken for architecture; while the standard of professional morality has been considerably lowered by the practice of competing architects sending in designs far in excess of the real cost. But there is another aspect of the question, and one which concerns the younger and less fortunate members of the profession. It may be urged with justice against Mr. Porter's proposal to discountenance competition, How are the less fortunate of the profession to attain the position and the emoluments of the more successful if open competition be done away with? It is now their only chance of winning a position and a name in the profession. Here we have unquestionably the greatest difficulty to solve. We are quite ready to agree to Mr. Porter's suggestion that "Fellows" of the Institute, by some dignified act, should refrain from engaging in competition; we think it would be an opportune and dignified thing for them to do, and would be setting a good example. But unless some corresponding advantages be offered to the profession outside the pale of the Institute, it is unreasonable to think they will forego the chances of competition distinction, simply because the "Fellows" of the Institute bound themselves not to compete. The Institute, at present, Mr. Porter must remember, is by no means a representative body, and until it becomes so it cannot suppose that its action will lead to the discontinuance of competition. That competitions, particularly small ones, are a serious loss to the profession, must be readily granted, as the instance we have cited, the Addiscombe-road Church competition, and the Shrewsbury Corporation Building Site competition, another startling example of impudence, may prove. That the total abolition of competition would accomplish the three things mentioned by Mr. Porter we do not doubt; but the abolition to be effective must be complete, and, as we have said, some inducement must be held out to the profession to make them relinquish it as a source of profit. We believe, therefore, the Institute would wisely restrict themselves to the first suggestion of Mr. Porter, and to the rectification of abuses that already exist. To endeavour to abolish the system at present would be abortive, and the only means, in our opinion, by which the Institute can hope to abolish competition would be to institute a test for professional competency.

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NEW BUILDINGS IN THE CITY.

THE old houses in Cheapside are, one by one, giving place to larger and more architectural buildings, and, during the last few months, several blocks of houses and shops have been pulled down, and their sites are occupied by large and pretentious chambers and offices. Some months ago we drew attention to a few examples of this gradual rebuilding of the leading City thoroughfare, and we now take another opportunity of referring to what has been done since. Considerable progress has, we find, been made with the new Mercers'-hall building in Cheapside, between Ironmonger-lane and the Old Jewry, the commencement of which we recorded some time ago. The front is entirely of stone, we believe Portland stone, and the leading features of interest in the elevation are the three-light windows enriched by engaged jamb, shafts of polished granite, with Ionic carved capitals, and the two flat canted bays, which break the straightness of the front. These are recessed, so that the frontage is kept within the main line, which has been considerably set back from the houses in the Poultry. The window bays are separated by rusticated piers. The building is now arrived at the second story, and from the details and flatly-treated horizontal mouldings—a very necessary precaution in narrow, ill-lighted streets—it promises to be a success. The old hall which stood on the site has been partly removed, but those who saunter behind the new building by entering the quadrangle from Ironmonger-lane, will be gratified to find many interesting remnants of old architectural carvings and mouldings. The remaining portion of entrance hall is enriched by Roman Doric columns, and the stairs and woodwork to be seen in this apartment will be found well deserving attention. The new façade will be a formidable competitor, in point of architectural pretensions, with Mr. Cole's Gresham Offices, which we have already illustrated, and, near by, the old church of St. Olave, with its square tower and pinnacles, adds contrast and additional interest to the improvements. Mr. I'Anson, architect, has been engaged in an extensive addition to Merchant Taylors' Hall on a site between the old hall in Threadneedle-street and Cornhill. The new building is Gothic in style and has two main frontages, with an entrance in Cornhill. Portland stone has been used, and the north façade is relieved by traceried windows and a wide bay in the centre. The plan of this new block contains a waiting-room, court, and committee-room, the former 37ft. by 24ft., the library and assembly room will be in connection with the banqueting-hall and garden. Mr. G. Shaw, of Earl-street, Westminster, is the contractor, and the cost is about £22,000. Continuing our survey, but proceeding westward, up Cheapside, we find Mr. W. Wimble, architect, of Queen Victoria-street, has just completed a neat, narrow stone-fronted building to be let for shops and offices. There is a basement and four stories besides the ground-floor. The chief points about the façade are the slight breaking back of the front at the sides, the carved, panelled pilasters between the windows, and the carved ornament to the frieze of upper story. The windows, of which there are three in width, are simply square-headed, with rounded corners, the centre window of the second story being emphasised by a flat pediment with carving. The double pilasters at ends fluted in part, the consoles and cornice over, and the treatment of the attic story appear to be in keeping, though the carved work is, perhaps, overdone, and will soon suffer from the usual discolouration. On the south side a little higher up the large block of shops and offices lately referred to by us, has thrown off its temporary mask of hoarding and placards, and the upper portion of the façade is now exposed to view. As an experimental effort to architecturalise a row of plain warehouses in which plate glass must be the chief element, we are inclined to think the work, so far as we see it, successful. The Manchester style is certainly improved upon by a little variety in the treatment of the plain piers—we cannot call it wall—that divide the successive rows of windows. The divisional piers have polished granite pilasters of the Corinthian order supporting a flat entablature, the windows in the subdivisions have narrow stone pilasters, and dark marble panels are introduced under the upper tier, which have the effect of contrasting at present with the stonework; but as the latter becomes begrimed that will not long be the case. The carving under the window-sills is a little *outré*, but the general details and dormers are effective. The second story is diversified by breaking forward the windows in the centre, these are crowned by attics and sculpture.

In Ludgate-hill we notice with satisfaction the completion of a block of offices and shops casually referred to by us, which has been built in front of the new Ludgate-square from the designs of Messrs. Joseph and Pearson. When its features were but latently developed, we thought we saw something better than the ordinary hackneyed type of façade; we can now fairly say that the front is one of the best we have seen of late. The architects have given us something fresher, purer, and more masterly in the way of street Classic; they have chosen a decidedly French treatment, the details and feeling are at least essentially so, avoiding the frigid classicism of the Greek, and the florid tendencies of the Anglo-Italian. The flat pilasters, relieved by plain flutings a part of their height, and by carved bands which divide the windows, the sculptured keystones to the upper windows, and the manner the entablatures are designed over them have a quietness and chasteness about them, without the fritter of mouldings and unnecessary carved ornament, the latter being confined simply to those parts which call for such relief. The mouldings and consoles are kept plain and flat, and are thoroughly Greek in feeling, while the incised Vitruvian scroll below the imposts of upper windows, and the flat pediments and capitals to pilasters thoroughly carry out the spirit of the style. All the window heads are square, but a pleasing break in the design is obtained by the more Venetian style of the ends. The attic story, broken by pedimented dormer windows and the introduction of a well-designed iron balcony railing over the mezzanine, carried by a slight projection of cornice supported on trusses, are pleasing features. The ground story is devoted to shops; these are separated by pilasters of polished granite with iron stanchion supports. The floors throughout are of concrete on the Dennett system, and a plain bold archway of granite leads to the square behind.

In Fleet-street, we observe fresh signs of improvemant. The grotesque front of the Plate Glass Company's premises, well known to most frequenters of this thoroughfare for its rococo and meaningless ornament, is being pulled down for rebuilding, and let us hope the day for such architectural travesties has passed away with the mania for building Chinese pagados and Egyptian palaces in our streets. Anderton's Hotel, since our last notice of this building, has been completed by the addition of another wing, and the effect of the design of Messrs. Ford and Hesketh may now be more fairly judged. The red-brick façade forms a lofty and striking object in the street, and the ornamental coped gables produce a rather severe contrast with the plain brick and stucco fronts on each side of it. The carved brick panels below the windows, and the general detail are not without a certain effectiveness, which might have been more thorough if the centre bay treatment had been modified, together with some of the details of the ground-story, notably the arch, with its rather feeble enrichment, and the end trusses underneath the balcony balustrade. In the mixture of the red brick and stonework, a judicious breadth has been maintained, and there is not that disagreeable spotty effect we have had occasion to remark sometimes when these materials are employed together. The stone arched window heads, with carved panels, are varied by the red brick panels, and the eye is not distracted by superfluous change. The entrance, of polished granite, leads by a wide corridor of considerable length, to the coffee-room, 26ft. by 20ft., and dining-room, 60ft. by 40ft. In the basement is a crypt or banqueting-room, 51ft. by 37ft., and 20ft. high, intended for Masonic purposes. It has a parquet-floor, and is lighted by a skylight. Another large banqueting-room is obtained in the mezzanine behind, and a considerable part of the hotel has heen specially planned to meet the requirements of Masons. The main staircase is of stone, and is square on plan, leading from the basement to the upper floor. It has a glass domical lantern. The kitchen is on the third floor, and is 40ft. by 26ft., and is fitted with apparatus by Messrs. Jones and Dray, of Leicester-square. Messrs. Bunnett have also supplied a steam lift. Apartments provided for ladies are on the first floor, and there are 110 bedrooms in all. Messrs. Brown and Robinson are the contractors, and we believe the cost of the building has been about £40,000.

PICTURES AND ETCHINGS.

SEVERAL oil and water-colour exhibitions are now open, and connoisseurs and others may find plenty to gratify their tastes in various branches. The pictures of British and Foreign Artists, now to be seen at the French gallery, 120, Pall Mall, scarcely come up to expectations, but there are several cleverly-painted subjects. Mr. T. F. Dicksee's "Madeline" is a picture worthy of the artist's reputation. The subject is suggested from Keats' poem, "The Eve of St. Agnes." The painter has seized the idea conveyed in the lines of the poet—

> "Her rich attire creeps rustling to her knees;
> Half hidden, like a mermaid in seaweed,
> Pensive awhile she dreams awake, and sees,
> In fancy, fair St. Agnes in her bed,
> But dares not look behind, or all the charm is fled."

Madeline is throwing off her garments before the toilet-table. The greenish silk sheen pervading the general tone of the picture, the beam of light, and the fair countenance, make a fanciful and dreamy subject that has been well conceived by the painter. M. Herwegen's "Interior" (14), A. Schreyer's "Arab Horsemen" (21), Garcia Y. Ramos' "Blow! Blow! ye Wintry Winds" (18), are clever pictures. We are struck chiefly by the high lights and bold handling of the "Arab Horsemen." Mr. Dicksee has, in the same key as in "Madeline," portrayed "Juliet," (34). She is shown in the balcony, and addresses Romeo. The greenish shade, the delicately-painted features of Juliet, her radiant eyes, are even more bewitching than those of the former picture. The architectural details of the balcony are not perfect, but the figure is clever. The "Village Politicians" (47), by C. Schloesser, is skilful in the attitude and expression of the disputants, and the execution is spirited. L. Munthe's "Road to the Village" is a pleasing wintry piece; the reflection of the sunset on the frozen pathway is cleverly painted; we must also note No. 61, "Literary Researches," by Mr. G. Kuhl. As a painter of landscape foliage Mr. B. W. Leader has few to surpass him. The sunny, half-lighted effect of "A Summer's Day on a Welsh River" (65), is charmingly truthful. The same artist also exhibits "A Rippling Stream, North Wales" (87), another very sweetly-painted piece of scenery, the birch-trees on the banks are very telling, and the artist has the power of painting with breadth, and yet not missing detail. Mr. Hayes' "Squally Day" (95), M. Kauffmann's "Tranquil Enjoyment," and K. Heffner's "Rhenish Lowlands" are all masterly pieces. "Still Life" (No. 77), by E. Murston, is a large picture, and represents a group of *objets de virtu*. The blue and white vase is well painted, and forms the central object; the other articles are various, and promiscuously thrown together, but the drawing and composition are clever and the colouring subdued.

Professor L. C. Muller's "Mecca Pilgrims," (78) is wonderfully truthful; the dark skin and features of the pilgrims and the details are all faithfully portrayed. T. Weber has given us a boldly-painted piece of sea, in No. 98, "Launching the Lifeboat;" Louise Jopling, a pleasing fancy bit in No. 103, and Aug. S. Lumley, a skilful composition in No. 105. "Southwark Bridge," (123), by Clara Montalba, resembles more a stone than an iron structure; the water and craft are broadly painted. One of the most noticeable pictures in the gallery is No. 136, "Cattle: Early Morning on the Meuse," by J. H. L. De Haas. The cattle are admirably drawn, the chiaroscuro and the long shadows cast by the early sun and the grey sky show that the artist is a keen observer of Nature. "Off Erith," 145, by Clara Montalba, is an effective bit of river scenery, in a low key of colour; so is "Rustic Flowers" (161), by Carle Bauerle, a particularly telling study of children's faces and red poppies; the blue vase makes an admirable setting to the picture. M. Goodman, in "A Wonderful Story," is sadly at fault in the girl seated on edge of fountain. The head and face are disproportioned to the lower limbs, which are far too cramped to be truthful. The great picture of the gallery is No. 180, "Le Bourget," by A. de Neuville, probably well known by this time to our readers, from the engravings. The incident recorded is the surrender of Le Bourget, which was shattered by shell by the Prussian guard, in the Franco-German War in 1870. A few French officers and men belonging to the Mobiles and Franc-tireurs defend themselves in a church to the last extremity; the artillery have stormed their improvised citadel, and they are at last obliged to surrender. The picture is both powerful and pathetic. The shattered condition of the edifice, the shelling of the houses, and the expression of the soldiers who are standing before the entrance, witnessing the bringing out of the remnant of the brave defenders, are thrilling, and the artist has seized, in a marvellous manner, the expression on the faces of the men We note also "Grandfather's Darling," (1[illegible]2) "Official Instructions," (178), and a few other pictures of every-day life well worth notice, but there are no classical or great compositions.

The Annual Exhibition of Water-Colour Drawings, by British and Foreign Artists, at T. M'Lean's Gallery, Haymarket, deserves a visit, for a few exquisitely-drawn subjects. Mrs. Helen Angell heads the list by some charmingly-drawn flower pieces. We particularly note the "Peonies," "White Roses and Columbines," "Roses," "Magnolias in blue pot," "Azaleas," and "Pale pink Roses in Turquoise Pot" (1 to 17). For delicacy of outline and contrast of colour, we have rarely seen any studies to equal these. Landscape is well represented by Mr. George Fripp in "Loch Lomond" (23), an aërial piece of effect in Mr. Earnest Waterlow's "Village Lane" (27), a broad and vigorous bit of handling; a wild torrent scene (54), by Mr. E. M. Wimperis; by Mr. Duncan's View near Godalming (79), a masterly drawing in the foliage and depth of colouring; and by a few other subjects by David Law, T. B. Hardy, and others. Of genre subjects there are many striking pictures. Mr. Geo. Clausen in his "Reidheim, an Alsatian Proprietor" (36), shows a vigorously drawn figure of a blooming lass, clad in peasant's costume. A similar study is No. 45, both excellent renderings of rural life in Alsace. We particularly remark a fine interior drawing of "Trèves Cathedral," by Mr. Wyke Bayliss (48), representing the crossing of that fine Romanesque example. The choir screen and pedimented piers, the sculpture and arcading are very effectively and broadly coloured, and the detail is worthy Mr. Bayliss's skill as an architectural colourist. "A Spanish Lady," by Guido Bach (52), is a clever contrast of complexion. M. Aug. Bouvier contributes a few poetically-conceived subjects of much merit; we may mention, for example, his "Pompeian Lady" (67), a highly decorative treatment with blue background; the arm is certainly rather faulty in drawing. The "Wreath" (129), is a young girl in a dancing attitude not without grace; the figure is fragile and pretty, and the drapery and accessories quite classical. Another emblematic study study is "The Tambourine," also represented by a dark girl with red cloak. The same artist's "Dancing Girl" (170), and "Lesbia's Pet" (181), are equally classical in conception, though the drawing is not always faultless.

We must notice a few admirable landscapes by Mr. D. Law. No. 106 is a fine study of cloud and mountain, and the same artist's "Lake Vennachir" (146) must also be noticed. Mr. J. D. Linton sends a Romantic incident from Sir W. Scott's "Peveril of the Peak" displaying dramatic power; the old couch and wall hangings are skilfully introduced. His scene from "Gil Blas" (111) is equally characteristic of this artist's pencil; "Dressing for School" (No. 16), by Artz; Mr. Hardy's "Grand Canal, Venice," Mr. Seymour Lucas's "Tailor" (178), Mr. T. Lloyd's (190), and Mr. G. Tofano's "The Novel" (209), are all cleverly drawn subjects, evincing considerable power in composition and excellence in drawing and colour.

Passing from paintings to etchings, we may draw attention to a few choice etchings of Ch. Méryon in Messrs. Dowdeswell's gallery in Chancery-lane. This great artist on copper, who died in 1868 mad from sheer want and neglect, has left some unique examples of his original artistic ability. Mr. Seymour Haden and Hamerton have both declared Méryon to have been one of the greatest artists, worthy to be associated with Dürer and Rembrandt. Méryon lived by himself, a castaway in the squalid streets of Paris, and the etchings we refer to are suggested by objects in that city, and represent many localities and buildings of architectural and antiquarian interest. For original power and imaginative qualities, these etchings possess considerable value. In Messrs. Dowdeswell's gallery we observe many very fine works, as for example "La Pompe, Notre-Dame," in four states; the etchings of "Tourelle, Rue de la Tixeranderie," lent by J. Knowles, Esq., and J. C. Day, Esq., are conspicuous for the freedom of execution and the intense feeling. In the latter the corner turret shows a correctness of detail that is surprising. The Apse of Notre-Dame is shown in three different states; in one we find the houses re-etched, and in the last the title and monogram added. The detail is drawn with considerable knowledge. Etchings of Paris during the close of the 17th century, in three states, are interesting for the glimpses of half-timbering; the College of Henry IV. is wonderfully truthful in the detail. "San Francisco" is a long etching full of conscientious work; the chevet of St. Martin-sur-Renelle is feelingly drawn in outline, though a little faulty in drawing. "Le Petit-Pont" is very fine, showing the towers of Notre-Dame in two states. Le Pont Neuf in four states of etching is remarkable for the vigour of light and shadow, and the same remark applies to the picturesque view, "Tourelle dite de Marat." The octagon turret is extremely picturesque. St. Etienne-du-Mont, shown in five different states, is another very clever etching of that fine Renaissance church; the pediments to front are drawn with consummate feeling and accuracy. So the charming bit, "Rue des Chantres," with the houses in shadow on both sides, and the elegant *flèche* or spirelet in the distance. Other etchings claim notice not only for the picturesque groupings and quaint bits of architecture, but for the inimitable truth, intense feeling, and careful detail they display. The least perfect part of his views are the trees, but even these are artistically executed. We may mention that many of the etchings are for sale.

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A VISIT TO LINGFIELD, SURREY.

NO pleasanter trip could be made by a lover of our ecclesiastical antiquities, than to the secluded village bearing the above name, and for a searcher after picturesque beauty and thoroughly rural scenery there is probably no spot replete with more to interest him than the one proposed to be inspected.

Taking it for granted that the tourist "hails from the great metropolis," let him take a ticket on the main Brighton line for East Grinstead, and proceed by it to Three Bridges, at which place he must alight and enter a train waiting on the left-hand side. Three Bridges has no point of interest in itself, but within a mile from it is the venerable church of Worth, an edifice retaining its original ground-plan of Saxon date, and with traces of Early work throughout the building. It ends in a circular apse, of much simple dignity, from the loftiness which so frequently characterises the erections of the 11th century being here seen in all the walls. A lych-gate and one or two other later details are of some interest.

A single line of rail from Three Bridges passes two small stations, each more or less in a wood, and with hardly a house to be seen near them, and soon East Grinstead is reached. Here, the College, the Anglican Convent of St. Margaret, and the picturesque, half-timbered houses, are well worthy of inspection and a more detailed description than can here be given, as Lingfield is the spot intended to be noticed. Suffice it that the parish church was erected when Gothic was but little thought of, and that it possesses a noble tower—a landmark for miles around. Of the College, it will be noted that it is a picturesque stone building, retaining many traces of the customs of our forefathers, and a spot replete with interest to every admirer of great minds from its connection with the lamented Dr. J. Mason Neale.

To reach Lingfield from here, a road must be taken leaving the town on the right, on quitting East Grinstead Station—a road tolerably rough, as the town has just undergone "a system of thorough drainage," at the hands of the irrepressible "eminent engineer" of the day.

Conspicuous on our right hand, at a little distance off, rise the picturesquely combined buildings of St. Margaret's Convent; the site is lovely, from the ranges of pale blue hills in the distance and the rich woods in the middle foreground. And here be it observed that all about Grinstead the prospects are as charming as could be imagined, especially, as is often the case, when combined with magnificent oak and beech trees forming a leafy frame to the picture.

Getting clear of the last cottage and the half-built "four-and-sixpenny houses," which, alas! appear an inevitable accompaniment to the vicinity of every place possessing "a station," the route proceeds by a sharp descent girded with oak and beech (and the Sussex oak is the noblest tree and finest wood in England); then a noble park is passed, and after four miles the village of Lingfield appears on the brow of a pleasant knoll. The place derived whatever little importance it ever had from the foundation of a college here, although an unsuccessful attempt was made to convert it into a rival of Tunbridge Wells, on the discovery of some medicinal water of similar properties. In the village, at the junction of three roads, is a peculiar stone erection about 20ft. high, and ending in an ogee shaped capping, and probably replacing a cross. At present it combines inelegantly with a tumble-down shed, 'yclept the cage.

A street, if such a term can be applied to some ten or twelve houses, leads to the church gate, and highly picturesque is this little thoroughfare. On the right a quaint erection of the Georgian period, with wood eaves, long narrow windows having cross-framed casements filled with lead lights, and whose flat arched heads are the perfection of ugliness, and of weak construction. Opposite is a half-timber house with moulded bargeboard, equally "piquant" in style, and far more graceful; the framing shows a filling-in of red brickwork, the bricks being placed in that diagonal fashion so dear to some modern architects. All round the churchyard cluster these comfortable half-timbered, weather-tiled abodes, with the most hearty contempt for sanitary science. To the north are houses with overhanging upper stories carried on massive timber knees at the angles, and at the west of the church an old mansion of 17th century date. Before entering the church, the village inn demands a few words. It is a quaint, comfortable-looking building, with a snuggery approached by an external flight of steps. It is called "The Star," doubtless in honour of the Cobhams, the lords of Starborough and founders of the college, their arms being *gules*, a chevron *or*. on which are three blazing stars *sable*, their coat being differenced by stars in place of black lions rampant on the arms of the Cobhams of Kent. This is an example of the interest attaching to old inn signs.

The church appears to have been almost rebuilt and greatly enlarged on the foundation of the college in 1431, but the tower and short shingled spire, with a few fragments, are plain Second Pointed. The belfry has only very small lancet openings, like many churches in the vicinity. The plan is very peculiar: a nave of four bays, tower placed on south of nave one bay from the west end of it, so as to form a porch; to the east of this a south aisle of two bays, a north aisle of four, chancel, and north chapel of three divisions, with a sacristy to the east of it, fitting in the third bay. The north chapel and chancel are raised over a crypt, which, from the situation of its small lancet windows, suggests that two altars may have existed in it. The nave and aisles have separate gables, and the roofs are continuous from west to east, as are the nave roofs of some large Sussex churches—*ex. gra.*, Horsham, Trotton, and West Hoathley. The effect of the long, straight lines of the north side, broken only by an octagonally-roofed rood-turret, is more peculiar than pleasing.

On entering the church the odd arrangement of the plan is strikingly apparent, the massive tower only opening into the nave by a doorway on the north side of perfectly plain walls. The chancel and other arches are of a poor and thin Third Pointed, suggestive of a lack of funds for the proper carrying out of so large a structure; this poverty of appearance is further heightened by the absence of all colour, except in some indifferent modern stained-glass. The roofs appear to be recent reproductions of the original ones, and the whole of the chapel screens remain, but none across the chancel arches, though the returned *miserere* stalls are *in situ*. The screen-work is plain, and rather poor, but the stalls are massive, and the *misereres* themselves carved with bold heads of bishops, shields of the Cobham arms, and foliage. The south side has at the easternmost end a large and lofty *poupet*, rising up against the screen, and is further noticeable from a slit cut across it, at the height which the ear of the occupant of the last stall would reach; its appearance and size are exactly like that of the aperture of a letter-box. That this feature was used for a confessional seems extremely probable, especially as it would be of ready access from the priest's door in the south chapel. None of the adjuncts of the altars remain, or traces of sedilia, or piscinæ, and the font is but poor-panelled Third Pointed work, though it had a good ogee-shaped canopied cover prettily crocketed, which now, strange to say, has been discarded for a vulgar flat affair ornamented with a coarse brass cross, the old cover being relegated to the rear of the organ, where it forms part of a heap of lumber, including, among other things, a helmet and crest from one of the monuments.

The Cobhams of both Kent and Sussex appear to have had a great liking for sumptuous memorials, the church of the college founded by the former at Cobham, Kent, and that erected by the Sussex branch of the family at Lingfield, being both remarkable in this respect. Here, in the centre of the lofty chancel, is the magnificent tomb of the founder, Reginald, Lord Cobham, and his wife; both the effigies are of white marble, and the tomb of stone. The male figure has his head bare, resting on a helm, whose crest is a turbanned Moor's head; he is in complete plate, and at his left hand is a gauntlet lying by his side; the feet rest on a dog (or leopard?). The lady is enveloped in a mantle, her head carried by angels, and the feet resting on a wivern or two-legged dragon, which, for vigour of design, would rejoice the heart of Mr. Ruskin himself. The sides of the tomb have large and small panels alternately: the former with coats of arms, the latter with smaller shields with the leopard and wivern alternated; a brass rim round the cornice bears the inscription, which, with some parts of the effigies and the colouring of the shields, are restorations. This fine work seems to call for an iron screen to inclose it, similar to the one at Arundel. Inside the north chapel, close to the parclose, is the tomb of another member of the family; it carries the effigy of a knight in armour, of Edward III. date; the whole has been highly coloured recently, let us hope only reproducing the old tinctures. The figure has a gilt helmet, whilst round the neck is mail armour painted black. It shows a jupon charged with the Cobham arms; the head rests on a helm crested as Lord Cobham's effigy, and the feet are placed upon a droll figure of a Moor in correct (?) Eastern apparel—turban, mantle, and black strap shoes; two more high tombs are in this chapel, but without sculptured figures; but one one bears a remarkably fine brass of Sir Reginald de Cobham de Sterburgh. He is in full plate-armour except the gorget or neckpiece; his feet are on a greyhound, who holds his head upturned looking at his master. The crest, coats of arms, and part of the inscription are new. On the floor of the same chapel are two beautiful brasses of ladies of the same family: one, *circa* 1380, is very fine, the other to Eleanor Cobham, 1420, is also a good example. Unfortunately for the antiquary, they have been much restored, doubtless with the best of motives, and in excellent taste; but anyone rubbing these as records of antiquity, should write down the parts which are new, and these are *at present* easily to be known by the lighter colour of the metal; in the course of time both will be undistinguishable. There are several stones here from which the brasses have been stolen; these have been simply refitted with plain brass plates, cut to the shape of the matrices—by far the best form of restoration, and one which would have been much more satisfactory had it been applied to the Cobham figures. A little demi-figure of a female in mantle, a tight-fitting "dress," with mitten sleeves beneath, date *circa* 1420, and with the laconic legend

Orate pro aīa Katerine Stroket.

A simple memorial this, but how suggestive to the moralist! Dr. Neale, in his "Hierologus" takes notice of the simplicity of the inscription. To the west of these brasses is another in memory of John Hardres, who died on the feast of SS. Simon and Jude, 1417. He is in full plate armour, and the figure is a good example of the military dress of the period. Brasses, still more brasses—one a pretty little figure of a lady with hair long and flowing, and head bound round by a jewelled circlet; a graceful "gown," as it was called in the writer's younger days, envelopes the person, whilst a little dog, with collar of bells, lies at the lady's feet. Near this are three brass effigies of priests: one a full length, is an excellent specimen, commemorating John Swetecok, 1467; the others are half-figures, one very small, to James Velson, 1458, the second to the memory of John Wyche, 1445. All these are in eucharistic vestments.

Behind the organ, on the floor, are two examples of a singular species of memorial, namely, two full-length figures, each cut on the surface of three broad tiles, and in a very rude and inartistic manner; the date evidently very late, probably that of Queen Mary's time, or Elizabeth's; but such a form of monument, if not absolutely unique, is very rare.

It should be mentioned that a plain Third Pointed double lectern stands in the chancel (it has been engraved in Mr. Parker's "Glossary," Vol. I.), to this are chained two folio volumes, a black letter James I. Bible, and a Jewel's "Apology."

The college was dedicated to St. Peter, as one of the inscriptions testifies, and the church, according to the "Oxford Manual of Brasses," to SS. Peter and Paul. Allen's "History of Surrey" is vague as to the nature of this foundation. He states the college to have been built "at the west end of the churchyard, for a provost, a master, and six chaplains, besides clerks, of the Carthusian order" (Vol. II. p. 87). At the Dissolution it was valued at about £80 per annum. An interesting inventory of goods at the church and house in 1524, forms a paper in this year's "Collections" of the Surrey Archæological Society. In Aubrey's time there was in the college hall windows the following, probably the motto of the house:—

Auxilium mihi semper a Domino,

and with this pious sentence this notice of Lingfield, Surrey, is brought to a close.

J. Lewis André.

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EFFECTIVE VENTILATION.*

By H. C. Stephens.

A HOUSE dwelling should afford us shelter from wind and rain, and while enabling us to obtain a comfortable temperature, should not deprive us of pure air for breathing. The ordinary house dwelling certainly provides us with shelter, but the requisite temperature and the pure air are obtained wastefully and with life-lowering insufficiency. The warming and ventilation of buildings is an intrinsically difficult subject, requiring unusual thoroughness and comprehensiveness in experiment. An illustration of the danger proceeding from the neglect of strict experimental investigation was afforded by the very general misconception with regard to the work performed by cowls in ventilation, which prevailed, until the president of this section (Captain Douglas Galton), with his colleagues, upon the Ventilation Committee, published the results of their experiments at Kew. It is to be hoped that the very great public benefit conferred by that investigation will not be limited to the dispersion of the unfounded pretensions of the cowl supporters, but that it will inspire an attitude of sceptical inquiry towards ventilating appliances in general. Perhaps, also, a lack of precision in language has contributed to obstruct our progress. I may mention the word "draught" as an instance of this. In the popular sense of the word, a draught means a stream of air of highly uncomfortable and dangerous quality, and generally we find the effect of movement in the air and the impression derived from its quality are confounded one with the other! Air perfectly at rest—stagnant air—though its quality may be good, is not agreeable to us, and perhaps not healthy. Mere movement in good air is agreeable and stimulating; fanning is so. Thus, in ventilation, a current or draught is distinctly an object to be attained, but of course the draught must consist of pure air, agreeble in temperature and in its other qualities. I will define the ventilation of houses as the maintenance of the atmosphere of a dwelling in that condition of purity, temperature, movement, and moisture which is found to be most agreeable to its inhabitants, and most conducive to their health and vigour. I think this definition is sound, although it goes beyond the limited sense in which the word is usually employed. The many modes of ventilating at present practised may be classified as belonging to three fairly distinct principles. 1st. We have ventilation by the natural or spontaneous method, or, as I prefer to call it, ventilation by the *exterior wind agency*. 2nd. We have ventilation by the operation of gravity obtained in ventilation by *heat agency*. 3rd. We have ventilation by mechanical appliances, as blowers, fans, or pumps, which may be described as *mechanical agency*.

Ventilation, dependent upon the *exterior wind agency* principle, is the form commonly employed for the introduction of fresh air into house dwellings in this country. The appliances for it are various in character. Among them are very numerous contrivances applied to holes in walls of buildings. To this principle also belongs the introduction of fresh air by tubes which convey it into the interior of dwellings in a manner to cause the least annoyance and discomfort. Tubes for extracting air open at the top, or surmounted by a cowl, whether used in conjunction with some mode for admitting exterior air or not, must also be placed in this class. In many of these contrivances the action claimed for them as proceeding by their operation, from difference in temperature between interior and exterior air, does take effect to some extent, but such action is altogether inconsiderable when compared with the influence exerted by the exterior wind currents to which the tubes are exposed. I would ask your earnest consideration as to the value and expediency of relying at all upon the force of natural wind currents for a supply of air for breathing purposes, and it would be a great step in advance to acquire clear views upon the merit of this form of ventilation. A leading cowl manufacturer in his prospectus says that the wind has an average velocity of ten miles an hour in this country—it is easy to calculate an average, but to be of use for ventilation that average speed should have a reasonably enduring continuance, it should represent a normal condition of the wind force—the wind in this country actually varies from about 1 to 30 miles per hour, however seldom such extremes may be touched. I live in the midst of trees and note the play of their foliage. I have ventilators based upon this exterior wind agency principle in some of my rooms, and I have carefully watched their action; both the foliage of the trees and the action of the ventilators attest the incessant and wide variation of the force exerted on them; further than this these appliances only deliver air when the wind is blowing on their side of the house, then those on the windward side deliver air rapidly, while from those on the leeward side no current is perceptible. It is true that when a fire is burning air will enter through them to compensate for that driven out by the fire currents; but the quantity and force will depend mainly upon the exterior wind currents. At one time air enters sufficient to replace that driven out by the fire currents; at another, irrespective of the action of the fire, the wind rushes in in an unwelcome torrent. In summer when there is in the temperature of the interior and the exterior of our dwellings but little difference, ventilation by appliances, really dependent upon "exterior wind agency," are often quite inoperative. The air is then frequently so still that a candle flame will suffer hardly any apparent deflection, even when passed through an open window, and at such times no current can be detected from tubes or other openings communicating with the external air. It is, however, precisely at such times that the need for the introduction of fresh air at a reliable rate is most felt. On the other hand, when the wind is driven through every chink and cranny of our houses, the air-tubes on this principle deliver a superfluous and unbearable addition to it. For the ventilation of sewers, cellars, and for what I can best describe as *air-cleansing work*, the fitful, but from time to time powerful and thorough sweeping obtained from the full force of an exterior wind current, is most valuable; but our respiratory process is regular and uniform, and something like a corresponding uniformity in the quantity and quality of the air supplied to our dwellings is required by us. If this be conceded, I submit that the admission of the force of wind currents is pernicious, and must frustrate the attainment of reliable and uniform ventilation.

Ventilation on the second principle, by *Heat Agency*, is a great improvement on that obtained by exterior wind agency; but if applied to extracting air by chimney draughts, the admission of air is usually allowed to depend upon appliances largely controlled by external wind currents. In summer the plan of propelling air by heat ventilation cannot well be carried out, and the stoves devised for it usually operate at that season of the year upon the external wind agency principle with its inaction during the hot calms of summer, and excessive action when the natural leakage of our houses introduces air enough.

It is by the employment of the third principle, that of *Mechanical Agency*, that we can alone become masters of the situation—able to introduce air at any required rate, and, at the same time, do very much towards raising its life-sustaining value. By the use of fans, blowers, or pumps, the quantity of air admitted is placed under easy and immediate control, and its condition can be modified so as to bring it to a near approximation with any desired standard. To furnish power for blowing or pumping air into large buildings is simple enough; but its application to the needs of private dwellings in a manner sufficiently simple, automatic, and inexpensive, is surrounded with considerable difficulty. The ordinary means for the application of power appeared incapable of furnishing a flow of energy in a form sufficiently attenuated for a machine required to do work as undeviating, and as constant as the process of respiration within ourselves. The descent of heavy weights, governed by clockwork movement, affords an arrangement by which a considerable amount of energy can be stored and liberated with uniformity at any desired rate.

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* A paper contributed to Section II. of the Sanitary Congress at Croydon.

A descending weight of one ton might run in a shaft by the side of a house from the top to the bottom, or from the basement downwards in a tube to any convenient depth, or by combining the two, a vertical fall of many feet would be obtained. The weight could be raised by multiplying pullies by hand power, or by any form of engine, steam, wind, hot-air or gas, but by using gas or hot-air engines, it would probably not be difficult to contrive some continuous automatic arrangement for starting the engine to wind up the weight. I have made trials in ventilation by using the fall of a weight (2 cwt.) descending 30ft. in connection with a small fan blower for the ventilation of a room, and I have also tried by means of the same machine the ventilation of a number of inclosed spaces representing in number and arrangement the rooms of a house. Another mode would be that of employing two cylinders of capacity sufficient to give the required force, running over pulleys, made to fill automatically with water at the highest cistern of the house, and to empty themselves into a lower cistern. The two cylinders would rise and fall alternately, so as to offer a continuous exertion of power. My results so far have been encouraging, but they are not sufficiently matured to lay before you. There is a plan patented by Messrs. Verity and Co., by which power is obtained from a very small stream of water from a cistern at the top of a dwelling-house, or direct from the water company's mains. Wherever water is available, and the amount of ventilation required is small, this plan is exceedingly convenient and inexpensive. Hot air-engines and gas-engines are now manufactured for machinists of a power low enough to enable them to be employed to give direct motion to a fan or blower without the aid of any intermediary. By using hot-air engines heated by gas a considerable, down to a very small, exertion of power can be obtained, which, with some precautions, may be expected to act with the permanent and regular motion absolutely necessary in any arrangement for ventilation.

After giving a good deal of consideration to the subject, and working at it in various ways by experiment, I came to the conclusion that we should not shrink from endeavouring to grasp, for an application to domestic buildings, the teaching afforded by the results of the best examples of ventilation in this country, such as the Houses of Parliament for instance. In short, that opportunities presented by a thorough and completely controllable system of air circulation should be utilised to the utmost, aiming at more than a mere replacement of breathed by unbreathed air. Pure air united to the climatic conditions most agreeable and desirable for us is what is wanted. One process should enable us in winter time to secure a summer-like condition of air, as well as to maintain a high standard of purity in it throughout the whole of our dwellings.

Nothing but long habit could reconcile us to the extraordinary barbarism of our present arrangements, a small patch of heat and a large space of cold in each room, by which the arrangement of the dinner-table and how to sit at work in one's study become problems it is impossible to solve; but such riddles are mere trifles and quite harmless compared with the important household question as to what condition or period of life, or what infirmity in health, constitutes a valid claim for the indulgence of a fire in the bed-room. The air of half our rooms is that of a cross between the atmosphere of a marsh and a glacier, and many of us leave a warm drawing-room to undress and sleep and dress in the morning during winter under circumstances of pain and peril. Our houses surely cost us money enough to build or to rent; why should we not keep the whole of them in a habitable condition? The labour, much of it of a very heavy and disagreeable kind, necessary for the average number of fires required in a large house is probably equal in the aggregate to the time and care which would suffice to produce with the proper appliances, any desired climatic condition throughout an entire house; and though the amount of attention required to carry out warming and ventilation in the form I contemplate may be too considerable for application separately to small houses, why could not such houses, if built in rows, or very near together, be supplied with pure air of summer climate from one source, taking precautions to prevent the loss of heat by the employment of non-conducting coats to the main pipes. The important item of saving effected by the avoidance of the destruction caused by stoves and open fires to the furniture, carpets, and hangings, must not be left out of consideration. In point of original cost it is probable that the numerous stoves, with all their attendant paraphernalia of mantel-piece, fenders, hearths, &c., in a house of twenty rooms, would cost as much in the first instance as the machinery for heating and ventilating, while in planning new buildings the arrangements for such a form of ventilation would not add materially to their cost.

I intend to apply these views to some buildings of different requirements I am about to erect. My endeavour will be firstly directed towards means by which the air used for circulation shall be endowed with qualities which will make those buildings comfortable and healthy at all seasons, and in all temperatures. The air will enter freely into a large chamber in which the whole of the appliances for heating the air, moistening it to obtain an agreeable dew point, filtering it from dirt and blacks, and finally despatching it, by means of a blower or other mode, at any desired speed, will be carried on. The details of arrangement for the circulation of air are, in some respects, those already well known, but in others they are of a special character. Great precaution is necessary to avoid any risk of injury to the quality or agreeableness of the air from the mode of heating it; but a chief cause of the difference experienced in the quality of air heated in various ways will commonly be found to be attributable to a neglect of its dew-point.

In conclusion, I submit that in experiment in ventilation we should keep in view, as desirable of attainment, the following:—

1. That the force of the current, the rate of supply, and quantity of air supplied for the purposes of ventilation of dwellings must be entirely under control.

2. That the quality of all the air supplied for ventilation of dwellings should be capable of easy approximation to any condition of temperature and moisture deemed desirable at any season of the year.

3. That greater influence should be exerted upon the circulation of air in dwellings by the apparatus for inflow than by the means for outflow of air.

PUBLIC WAYS IN THE CITY OF LONDON.

THE last time the area of the public ways of the City of London was ascertained was in 1843. Since then great changes have taken place in the City: Queen Victoria-street, Cannon-street, the Holborn Viaduct and its approaches have been formed; the Poultry, Newgate-street, Liverpool-street, part of Queen-street, Fenchurch-street, Great Tower-street, Little Tower-street, Fleet-street, and other important thoroughfares have been widened, and improvements of minor importance effected in nearly four hundred of the streets and places within the City.

Owing to those alterations, many courts and public ways have been inclosed and built over, others have been thrown into, and now form part either of the widened or of the new thoroughfares, and many more have been appropriated for the construction of the various railways now existing in the City. In 1877 the Inspectors of Pavements were directed to measure the public ways within their respective districts, which work they completed last year. Since the results have been tabulated and laid before the City Sewers Commission by their engineer, Mr. W. Haywood.

The total area of carriage-ways is in main streets, 272,360 superficial yards; in second-class streets, 58,313; in third-class streets, 100,956; in courts and passages, not having thoroughfares, 11,515; the Victoria Embankment, from Blackfriar's-bridge westward to the City boundary, 11,925; London, Southwark, and Blackfriars-bridges, with part of their southern approaches, 13,881; total area of carriage-way, 468,950.

The total area of foot-ways is in main streets, 133,671 superficial yards; in second-class streets, 40,520; in third-class streets, 72,633; in courts having carriage-ways, but not being thoroughfares, 7,306; in courts having foot-ways only, and being thoroughfares, 38,361; in courts having foot-ways only, and not being thoroughfares, 20,269; the foot-ways of Leadenhall Market and the entrance to Farringdon Market, 733; the Victoria Embankment, 6,506; the bridges, &c., 8,609; total area of foot-way, 328,608 superficial yards; total of carriage-ways and foot-ways, 797,558 superficial yards.

The length of the public ways of the City of London under the control of the Commissioners of City Sewers, at Christmas, 1878, were: Main streets, 13 miles 380 yards; second-class streets, 6 miles 721 yards; third-class streets, 14 miles 408 yards; courts with carriage-ways, but not being thoroughfares, 2 miles 350 yards; courts with foot-ways only, and being thoroughfares, 6 miles 1,114 yards; courts with foot-ways only, and not being thoroughfares, 3 miles 590 yards; Leadenhall Market and entrance to Farringdon Market, 187 yards; the Victoria Embankment, 528 yards; London, Southwark, and Blackfriars-bridges, with part of their southern approaches, 1 mile 1,646 yards; total, 48 miles 664 yards.

Of the main streets, being omnibus lines and including the bridges, the length is 6 miles 1,523 yards.

The number of public ways of the City of London under the control of the Commissioners of City Sewers, at Christmas, 1878, was as follows:—Number of main streets, 74; second-class streets, 74; third-class streets, 266; courts having carriageways and not being thoroughfares, 75: courts having footways only and being thoroughfares, 189; courts having footways only and not being thoroughfares, 151; public ways in approaches to markets, 2; London, Southwark, and Blackfriars-bridge, 3; The Victoria Embankment, 1: total, 835.

THE HUDSON RIVER TUNNEL.

THE Hudson tunnel was begun in November, 1874, after extensive borings which had been begun a year before in the bottom of the Hudson river. A circular working shaft 30ft. in diameter, walled with 4ft. of brick, was begun 100ft. inland, it being intended to make it 65ft. deep, at which point the tunnel was to be constructed. Five years' litigation has delayed the project; but the engineer, Colonel Haskin, now expects to get well under the river before winter sets in. It is estimated that the tunnel will cost £250,000. It will be 12,000ft. long, including the river approaches, and the greatest depth under water will be over 60ft. The site of the New York terminus has not been fixed upon, but Washington-square has been suggested. It is now proposed, to gain time, to work at once on each side of the river, as many men to be employed as possible at one time in gangs, which are to be relieved every eight hours. The company claims that by the aid of compressed air, as applied in the patent obtained by Colonel Haskin, it will be able to complete the work at much less expense than any similar work has ever been constructed for. The plan of construction contemplates no coffer-dam, caissons, or Brunel shields, the compressed air introduced into the face of the tunnel being expected to exert sufficient pressure to hold in place and prevent any irruption of silt, clay, or water. The air pressure is also expected to carry back to the working-shaft through pipes, all sand, mud, or water that may accumulate in the heading during the course of the excavation. It is believed that the tunnel can be advanced 5ft. a day, and that the whole work can be completed in two years. All this, of course, is contingent upon the success of Colonel Haskin's method of tunnelling. That it will succeed without radical modifications is questionable, indeed altogether impossible, since the air in the tunnel would have to be maintained at a density at least equal to that of the semi-fluid materials to be supported. The tunnel is to be circular in form, 26ft. wide and 24ft. high.

MODERN TRAMWAY CONSTRUCTION.

AT a meeting of the Society of Engineers, held on Monday evening, a paper was read by Mr. Wilkinson Jones on "Modern Tramway Construction." In introducing the subject, the author explained that the object of his paper was more to describe the various systems now in use than to suggest any modifications or improvements. He then proceeded to state that the first modern tramway was laid in New York, as far back as 1832, with a rail somewhat similar in section to that now in use, although considerably heavier, its weight having been as much as 98lb. per yard. The introduction of the tramway into England, by George Francis Train, in 1860, was then referred to, and the development of the tramway system and the merits of the various rails employed from time to time briefly considered. The author considered that the failure of the Train system gave a check to the progress of tramways in this country, as it was not until 1868, when the Liverpool Tramways Act was passed, that tramways began to make much headway. He then proceeded to describe the present mode of constructing tramways with rails and wooden sleepers, and referred to the method designed by Mr. Robinson Souttar, which appeared to have much to recommend it, and especially alluded to the Liverpool tramways laid on Deacon's system. The various systems of metal ways were then described, and their respective merits pointed out. Among these were mentioned Livesey's and Cockburn Muir's systems as laid in South America; Ransome and Rapier's and other cast-iron harbour tramways; Kincaid's system of rails with intermittent bearings; Barker's system of continuous sleeper as laid in Manchester; and Aldred and Speilman's system of reversible rail with cast-iron chairs. Some results of the tests made with various rail sections were given, and the author concluded his paper by a few remarks upon the nature of bearings, foundations, and fastenings, and pointing out the essentials of an ideal modern tramway.

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BIRMINGHAM MASTER BUILDERS' ASSOCIATION.

THE annual meeting of the members of this association was held on Monday; Mr. J. Garlick, president for the past year, presiding *pro tem.* There was a very large attendance. After the transaction of some formal business, Mr. W. H. Parton was elected president for the year, and Mr. C. W. Barker was appointed vice-president.—The Committee, in their report for 1879, regretted that they were unable to congratulate the members upon any appreciable revival of the building trade, but trusted that by a reduction of wages and moderate prices of materials, to obtain a return of that briskness of trade which they enjoyed some years back; and having this object well in view they had arrived at the determination that it was absolutely necessary, as well for their own interests as those of the general public, that a reduction of wages should take place in the town, with such a modification of the existing working rules as would tend to remove many of the difficulties the trade had hitherto to contend against. The association now numbered 72 members, 7 new ones having joined during the year. The total receipts for the year were £142 17s. 7d., which, added to the balance from last account of £120 12s. 3d., made a total of £263 9s. 10d.; and the various disbursements, including secretary's salary, to £133 13s. 8d., leaving a sum of £129 16s. 2d. to the credit of the association. At five o'clock the members dined together at the hotel, under the presidency of Mr. W. H. Parton. The President proposed the toast of the evening, "Success to the Birmingham Builders' Association." He had lately read many speeches about the depression in trade, and all the speakers had given different solutions as to how the depression had been brought about and how it was to be removed. The members of that trade knew that some eight or nine years ago, when the Franco-German war broke out, it gave a very great impulse to trade in England, from the fact that foreign securities became insecure and capitalists rushed into bricks and mortar. Very many tradesmen laid aside their legitimate trade and entered upon the building trade, under the impression they were going to get rich all at once. As time went on those speculative builders had to be supplied with men, and having been supplied the building trade proper had to succumb year after year to the advances made upon them by the men. Hence it was that wages went on increasing to what they might term an unnatural height. The speculative portion of the trade had now gone out. The association had just given notice to the operatives of a reduction in their wages. The reductions were to be that of 1d. an hour in all branches of the trade, and 1½d. to the labourers. In proposing this decrease the association was of opinion that materials would also be reduced, and there would be a great stimulus in trade in the spring of next year.

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SILICATE PAINTS AND NON-POISONOUS COLOURS.

WE have many times drawn attention to the silicate paints manufactured by the Silicate Paint Company, of Charlton. The company, which has lately been reorganised and which has now fully established itself in its new premises at Charlton, have effected such important improvements in many of the pigments manufactured by their predecessors, and so altered and extended the lists of colours in the development of the principle of *Non-Poisonous Paints for all purposes*, that to prevent confusion it has been deemed advisable to withdraw the price lists and pattern cards of the late firm from circulation, and at once replace them by a new and complete catalogue of the improved manufactures. This step became all the more necessary when it was determined so to reduce prices as to place the specialities of the new firm in still more favourable comparison with the ordinary lead paints, varnishes, &c. It is due to the late firm to explain that the demand for their manufactures, which had received favourable notice from learned societies and the technical press generally, had latterly been so great as to far exceed their ordinary powers of production. The difficulties, however, which beset them no longer exist to affect the new concern. The works at Charlton are adequate for a most extensive output, and arrangements have been made speedily to duplicate the plant so soon as occasion shall render such a step necessary.

In addition to the well-known specialities of the old firm, the "Charlton White," the "Silicate" and "Enamel Paints," and the "Petrifying Liquid," the new firm have undertaken the supply of "Charlton anti-fouling paint" for ships' bottoms, non-poisonous "marine paints" for ships' sides, holds, &c., "tinting colours" (in oil and water) for staining silicate paints and tinting washable distemper, painting brushes specially designed for use with the company's paints, varnishes, wood stains, sheet and plate glass, and "Charlton Lakes and Pulp Colours" for paper-staining and other purposes.

This last mentioned speciality is a novelty worth attention. The company's chemist, Mr. J. B. Orr, having long studied the production of inoffensive lakes in both vegetable and mineral colours, has succeeded in furnishing a complete series without employing in their manufacture any poisonous ingredients whatever. Formerly lead, arsenic, copper, and antimony salts afforded but too ready a mode of giving brilliancy to many colours, and the demand for "bloom" encouraged manufacturers to continue and even increase the evil. The evils, however, occasioned by the use of such pernicious compounds have at last aroused public attention, and at no very distant date we trust the Legislature will put a stop to their use altogether. In the mean time buyers of lake colours for all purposes will do well to exclude every poisonous preparation from their list, as the necessity for retaining them no longer exists. The "Charlton" lake colours are quite as economical in working as their deadly rivals; and if in some few instances they are slightly less lustrous, this is more than compensated for by superior solidity and inoffensiveness.

It will be seen that in the extensions contemplated in the business of the Silicate Paint Company, the leading principle of the old firm—the abolition of the use of all poisonous or deleterious ingredients—has been steadily kept in view. The importance of this principle from a sanitary point of view cannot be too strongly insisted upon, and its constant recognition cannot fail to secure the support of all who care for health. It is as well to remind our readers that the company has adopted a new trade mark in addition to the old one, on which the belt bearing the name of the company encircles the initial letters of the names of the three proprietors, divided by two crossed oars, together with the word "Charlton" on a separate riband below. All preparations will in future bear both the old and new trade marks.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

ST. PAUL'S ECCLESIOLOGICAL SOCIETY.—The session for 1879-80 of this society will be opened on Wednesday evening in next week by a *conversazione* of members at the Chapter House, St. Paul's Churchyard, E.C. Loan collections of ecclesiastical art objects will be on view. For the ensuing session the following papers have been promised:—"Old St. Paul's," by Mr. Edmund B. Ferrey, F.R.I.B.A.; "The Christian Altar, Architecturally Considered," by Major Alfred Heales, F.S.A., M.R.S.L.; "Christian Iconography," by Mr. G. H. Birch, A.R.I.B.A., and one, of which the subject has not yet been named, by Dr. Stainer.

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ARCHÆOLOGICAL.

FRASERBURGH—DISCOVERY OF A ROMAN RELIC.—The other day, while some labourers were engaged in excavating for the purpose of drainage in the vicinity of Philorth House, Fraserburgh, they discovered, at a depth of about 9ft. from the surface, a large urn, similar to the ancient Samian ware. Deposited in the bowl of the urn were a dozen or so of Roman silver coins and an iron spear-head. The urn is in a very good state of preservation, and on one side of it the following inscriptions are perfectly legible in Tuscan:—"Iti sapis potandis ab igoni;" in Latin, "In hoc signe spes mea in situ."

PERGAMOS.—The site of ancient Pergamos has unexpectedly proved a perfect treasure-house of Greek statuary and art. A German engineer, M. Humann, employed by the Turkish Government just before the war to construct a road in that part of the country, had his attention called to the fact that monuments of various kinds had come to light from time to time among the ruins of Pergamos. He mentioned the fact to the German Government, which lost no time in taking advantage of it. A firman was obtained from the Porte, and about six months ago M. Humann commenced excavations on the spot. He first dug in the lower town, where he found some remains of considerable interest, but soon transferred his operations to the site of the Acropolis. Here his success has been complete. About 200 statues and sculptured pedestals, belonging for the most part to the best period of Greek art, have been discovered. Among them are a figure of Eros, a group of two nude female figures, sleeping, with the arms thrown round each other; a colossal figure of Laocoön struggling with the serpent; and a nude warrior, armed with shield and sword, in the act of trampling on the face of a fallen enemy and of attacking another. The statues of several Roman ladies have also been found, besides a richly-ornamented vase which once supported a colossal image of Zeus. It is adorned with symbolic representations of the various elements and their presiding deities, the words, "Earth," "Heaven," and the like, being added to make the intention of the artist more evident. Near the same spot statues of satyrs and tritons have also been uncovered, besides a highly-elaborated altar. Most of the statues come from a temple dedicated to Athena, which is itself a very fine example of Hellenic architecture. A portion of the richly-ornamented frieze belonging to it has been sent to Berlin. Along with this splendid collection of ancient art, the Berlin Museum has further secured two colossal figures, one male and the other female, recently found on the site of Cuma, and purchased by the Prussian Government for £1,100.

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At the meeting of the London School Board on Wednesday, Mr. A. Young's appointment as assistant surveyor was confirmed for one year, he being allowed to take a share in a surveyor's private practice. It was reported that the following schools, all in Chelsea district, are nearly completed, and will shortly be opened: Star-lane. Fulham, Albion-road, East, Latimer-road, and Middle-row, the last being an enlargement.

At a meeting of the West Bromwich Improvement Commissioners, on Wednesday, it was reported that at the theatre in that town, deviations had been made in the plans which rendered the building unsafe and liable to fire. It was resolved that the responsible parties in connection with the theatre, as well as a number of builders who had infringed the by-laws, should be summoned before the magistrates.

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OUR LITHOGRAPHIC ILLUSTRATIONS.

THE GRANGE, RAMSGATE.

The houses built by architects for their own occupation have always been of exceeding interest—more especially when they have been men of moderate means—in which cases it is to be imagined we should find the whole skill of the architect deveveloped to produce the best results at a given cost. It is much to be regretted no one has taken up the subject and illustrated it. If any record, for instance, could be found of John Thorpe's house, with what interest should we compare the treatment of his own modest dwelling with that of the great mansions he built for the Tudor statesmen and merchant princes. Of modern architects, few appear to have erected houses for themselves which call for particular notice—it is, therefore, gratifying to be able to publish an illustration of the residence designed, built, and occupied by Augustus Welby Pugin—and which at a small cost presents inside and outside the embodiment of picturesqueness and comfort. When leaving Salisbury his first thought was a healthy and cheerful site—he chose the West Cliff, Ramsgate, which presented physically the necessary conditions of dryness and shelter, at the same time a view, perhaps, unequalled in Britain. The soil is chalk, sloping gradually to the sea. The top of the cliff, on which the house is built, is about 60ft. above the sea-level. The view gives at once an expanse of sea and land that are not attainable elsewhere in Kent: Cape Grisnez and the Downs are to the south-west, and on the west is the beautiful country lying between Deal and Sandwich, the ancient spires of which last town may be seen from the Grange. On the north the rising ground of the Isle of Thanet protects the site from the winds. Local yellow stocks and Bath stone are the materials used externally. There are three entrances, the principal one being the carriage-way from the road. A quad is formed inside the gates of the house, stables, and presbytry. The entrance is protected by a covered way, the hall rises to the roof, with the stairs and landings forming a balcony round. On the right of the hall is the withdrawing-room, communicating with the library and conservatory, all having southerly and westerly aspects. The dining-room has a southerly aspect and sea view, and is arranged with serving buffet and passage so as to exclude all the dining arrangements from the rest of the house, although proximate to the hall and withdrawing-room. The offices have been placed north and east, so as to give warm aspects with sea and land views from each window. The fireplaces are what they should be—the bases of chimneys—with low grates and stone kerbs. Pitch-pine has been used for all the joinery, and after thirty years' wear has assumed a rich colour. Considerable additions have been made from time to time by the sons of Pugin. The garden, which terminated on the edge of the cliff, has been honeycombed with caves, which have been excavated by Cuthbert Welby Pugin, in several tiers, communicating by steps. The face of the cliff has been scarped, and the brick piers built to carry the town promenade have been utilised to form graperies, bed and dining-rooms, kitchen, smokeries, and all the accessories of a summer residence. Taken as a whole, the Grange may compare favourably with any house of its size in the kingdom, and a visit to it by students of domestic architecture will be well repaid. The church adjoining the house was designed and built at the cost of Pugin, while the monastery was designed by the late Edward Pugin. Here we have within a few acres, which forty years ago was a barren field a house, church, and conventual building, the sight of which would have gladdened the eyes of the tourist of the middle ages.

SIGNS OF THE ZODIAC AT CARCASSONNE.

In most French cathedrals of the 12th and 13th centuries, the signs of the Zodiac are to be found carved over one of the porches. Sometimes, as at Vezelay, they accompany the figures of the Twelve Apostles, but more frequently they form a series of separate panels placed in some conspicuous position. In restoring the fortified church of St. Mazaire, in the City of Carcassonne, the late M. Viollet-le-Duc took advantage of this custom to insert under a sundial or clock, I forget which, which existed over the main doorway, a series of panels representing the Zodiac. To the best of my recollection, there were no traces of any such work having previously existed; but M. Viollet-le-Duc found, in what was an almost universal custom elsewhere, an excuse for giving interest and beauty to a wall otherwise somewhat blank and naked. Our illustration is taken from a tracing of M. Viollet-le-Duc's original sketches given to the workmen, and now in the possession of M. Cals, Inspecteur des travaux à Carcassonne.

It was M. Viollet-le-Duc's invariable custom to give rough pencil-sketches tinted in sepia or Indian-ink for all the ornamental details of the works on which he was employed. His wonderful facility of execution and thorough knowledge of Mediæval architecture enabled him to give half a dozen of such sketches in the time in which most men would have been laboriously concocting one; and as he had the true gift of genius, that of bringing others into sympathy with his ideas, he seldom failed to get them carried out as he wished, even from the slightest sketch. Having owed so much to him, I may, I hope, be pardoned if I here express my deep sorrow at his sad and sudden death—sorrow, not so much for the incomparable artist and man of learning, though that loss is irreparable, as for the man himself, the kind friend who was ever ready to help and encourage even those who, like myself, had no sort of claim upon him beyond a love for their common art.

> " Ce qu'il nous faut pleurer sur sa tombe hâtive,
> Ce n'est pas l'art divin, ni les savants secrets:
> Quelque autre etudier a cet art qu'il a creé;
> C'est luimême, son âme, et sa grandeur naïve,
> C'est cette voix du cœur qui seule au cœur arrive,
> Que nul autre, après lui, ne nous rendra jamais."

G. Hubert West.

Ascham School, Bournemouth.

ST. MARY'S CHURCH, STONE, AND FAIRFAX HOUSE, PUTNEY.

During the past summer season some sketching trips on Saturday afternoons have been made by members of the Sketching Club in connection with the Royal Architectural Museum at Westminster. The drawings published to-day are from the sketch-book of Mr. Maurice B. Adams, and are simply sketches made on two of the above occasions. The first bears the date of June 14th, and represents the interesting and beautiful church of St. Mary, at Stone, in Kent, from the north-east, as restored by Mr. George Edmund Street, R.A., a few years since; and the second, made on Saturday, August 2nd, illustrates Fairfax House, Putney, which is one of the most perfect and genuine examples of so-called "Queen Anne" street residences to be found in the country. The material is red brick with moulded cornices, these, however, are of the most simple character, though exceedingly effective. The woodwork is painted white throughout, excepting the front door, which is of a quiet green. The upper windows in the gables are chiefly of quarry glazing, and cut brick cills are to all the windows. The big shell coved porch is an unusually fine specimen, and it is constructed entirely of wood. The roofs are covered with tiles, and the central structure of wood over the main roof is comparatively of modern date. Miss Gurthie in her work on the "Old Houses of Putney" gives some interesting details of the ancient mansions at "Putenhie," as the village was called in the "Doomsday Book," Fairfax House and Chatfield House, both situate in the High-street, being the most important of these old residences which now remain. Queen Elizabeth is said to have dined at Fairfax House on one occasion, and Miss Gurthie believes it to have been erected by a gentleman bearing the name of Fairfax during Elizabeth's reign, but the style of the present house would certainly suggest that "Good Queen Bess" could hardly have dined in the present building at any rate, as it seems to be of much later date. At the back of the house is a spacious lawn, where Bishop Juxon is recorded to have planted the existing trees. Chatfield house is of interest as a plain example of brickwork, of the same date as the building which we illustrate, and, moreover, Leigh Hunt died here while on a visit to Putney, thus adding an interest to the building. "The Palace" no longer remains, and its site is occupied by River-street and River-terrace, where originally the mansion of the Wellbecks stood; their monument in the Parish Church bears the date of 1477. The "Palace" was erected at the end of the sixteenth century by John Lacy, clothworker, of London, and it is recorded by Nichols in his "Progresses of Queen Elizabeth" that she honoured Lacy with her company more than any of her subjects, frequently remaining here for three days at a time. Stone Church was described in our pages on the Friday following the date of the sketch.

TWO HOUSES AT STONEYGATE, LEICESTER.

We this week illustrate a perspective view of these houses, taken from a drawing exhibited in the Royal Academy this year, designed by Mr. Isaac Barradale, F.R.I.B A., Leicester, for John Whitmore, Esq. Objectionable buildings on the south, and a northern aspect have necessitated various-shaped windows in order to obtain sunshine, and the extensive views to the east and west. Red Whitwick bricks have been used for facing on all fronts of the buildings, and red Dumfries stone for the window dressings. The roofs are covered with strawberry-coloured Broseley tiles, with red Maidenhead ridges, and the cove to the eaves is formed with plaster. The timber framing is red deal, carefully selected and coloured with Stockholm tar. Including granite walling and gates, the cost will be about £5,400. The works have been very creditably carried out by Mr. Nicholas Elliott, builder, Leicester.

MEMORIAL IN ST. PANCRAS GARDENS.

See description on page 561.

CHIPS.

Two stained-glass windows have just been placed in the north aisle of the chancel at Louth parish church. They are of three lights each, and the subjects are, "Christ's Entry into Jerusalem," and "Christ Walking on the Sea." The windows are from the studios of Messrs. Heaton, Butler, and Bayne, Garrick-street, Covent-garden.

The Primitive Methodist Chapel, Darlaston, was reopened on Tuesday week, after having been altered at a cost of £1,300, and the erection of a new organ by Messrs. Nicholson and Lord, of Walsall, at a further cost of £500.

At the annual meeting of the supporters of the Free Library and Reading-room, Upper Kennington-lane, S.E., held on Wednesday week, it was announced that the City Guilds Institute had determined to extend their operations to the south side of the Thames, and that two houses had been taken in the Kennington-road to be used in connection with the Lambeth School of Art. The whole expenditure of the library since it was opened in October, 1878, and including the cost of the fine arts exhibition, visited by 4,000 persons, had been about £350. Mr. J. Wyke Bayliss delivered during the evening a lecture on the characteristics of Greek and Gothic architecture.

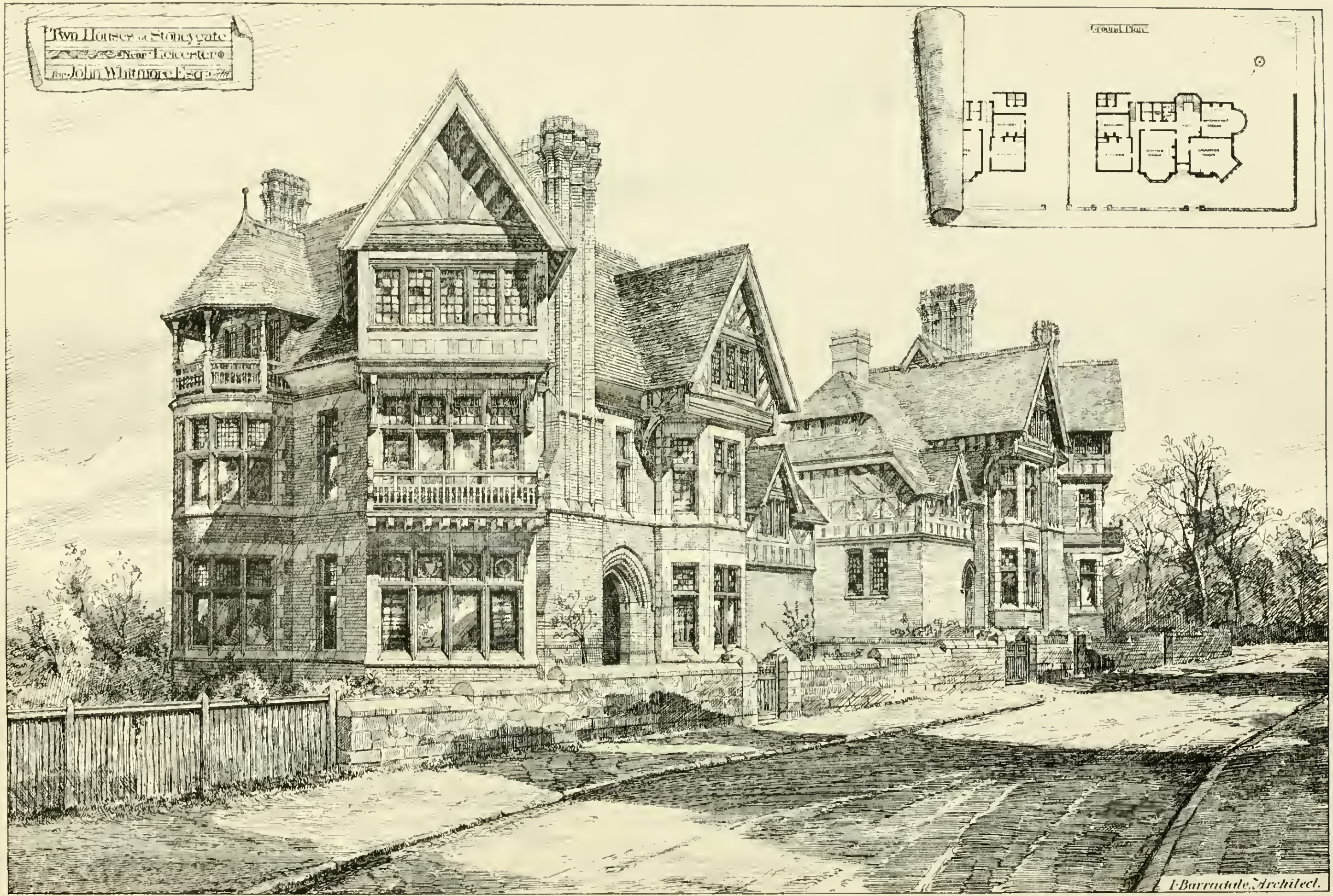


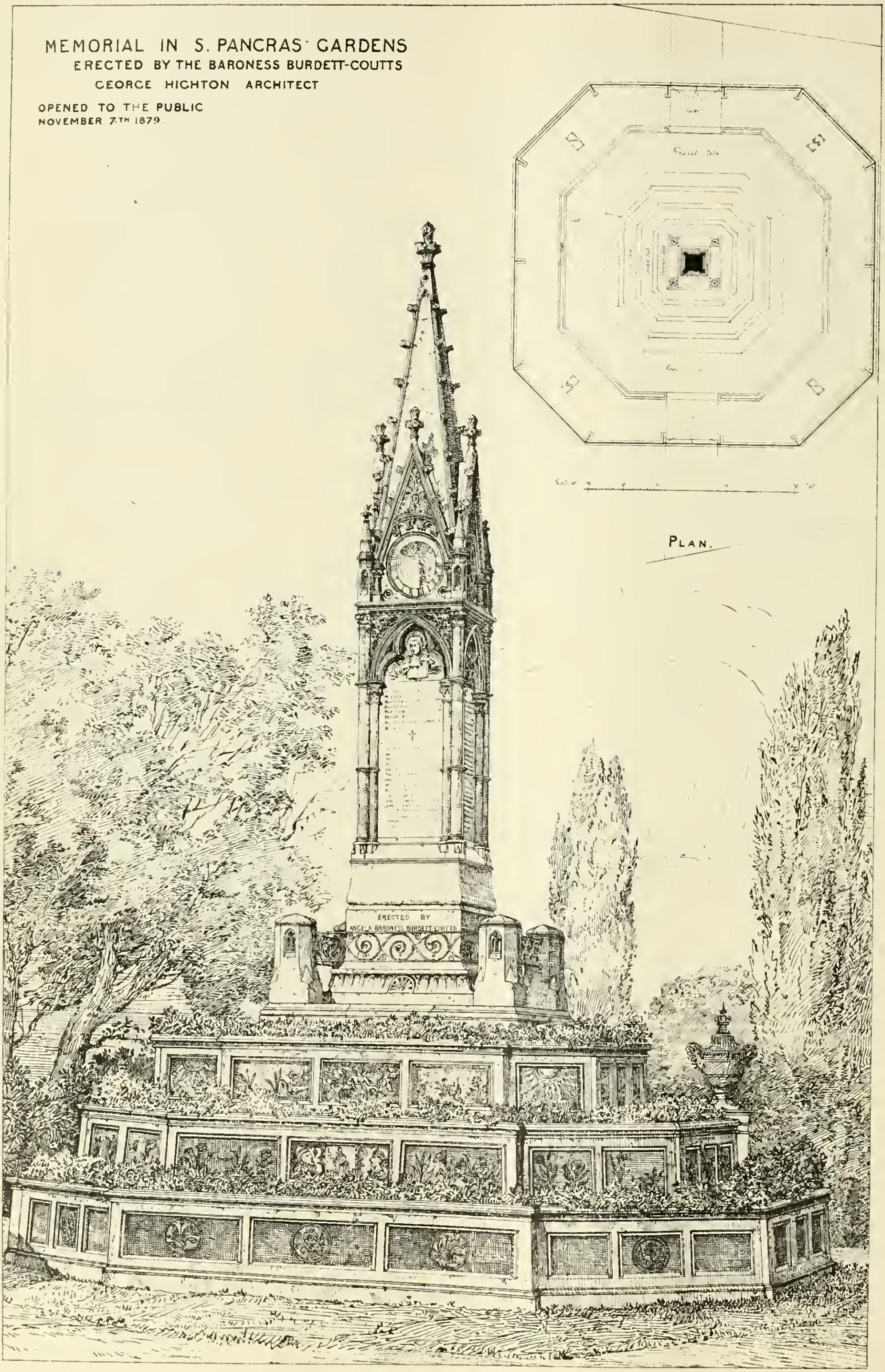
Photo Lithographed & Printed by James Akerman, 6, Queen Square W C

MEMORIAL IN S. PANCRAS GARDENS

ERECTED BY THE BARONESS BURDETT-COUTTS

GEORGE HIGHTON ARCHITECT

OPENED TO THE PUBLIC
NOVEMBER 7TH 1879



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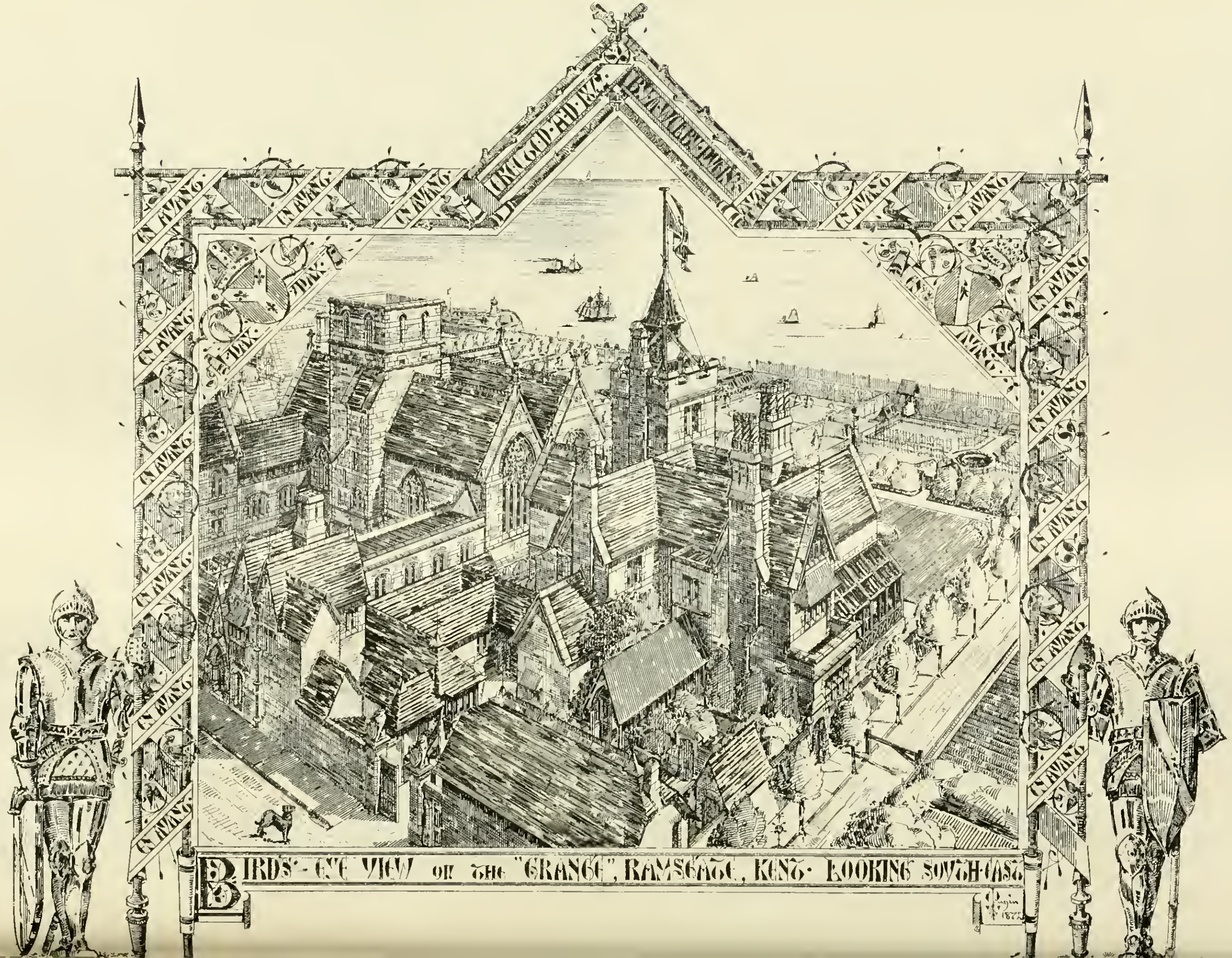
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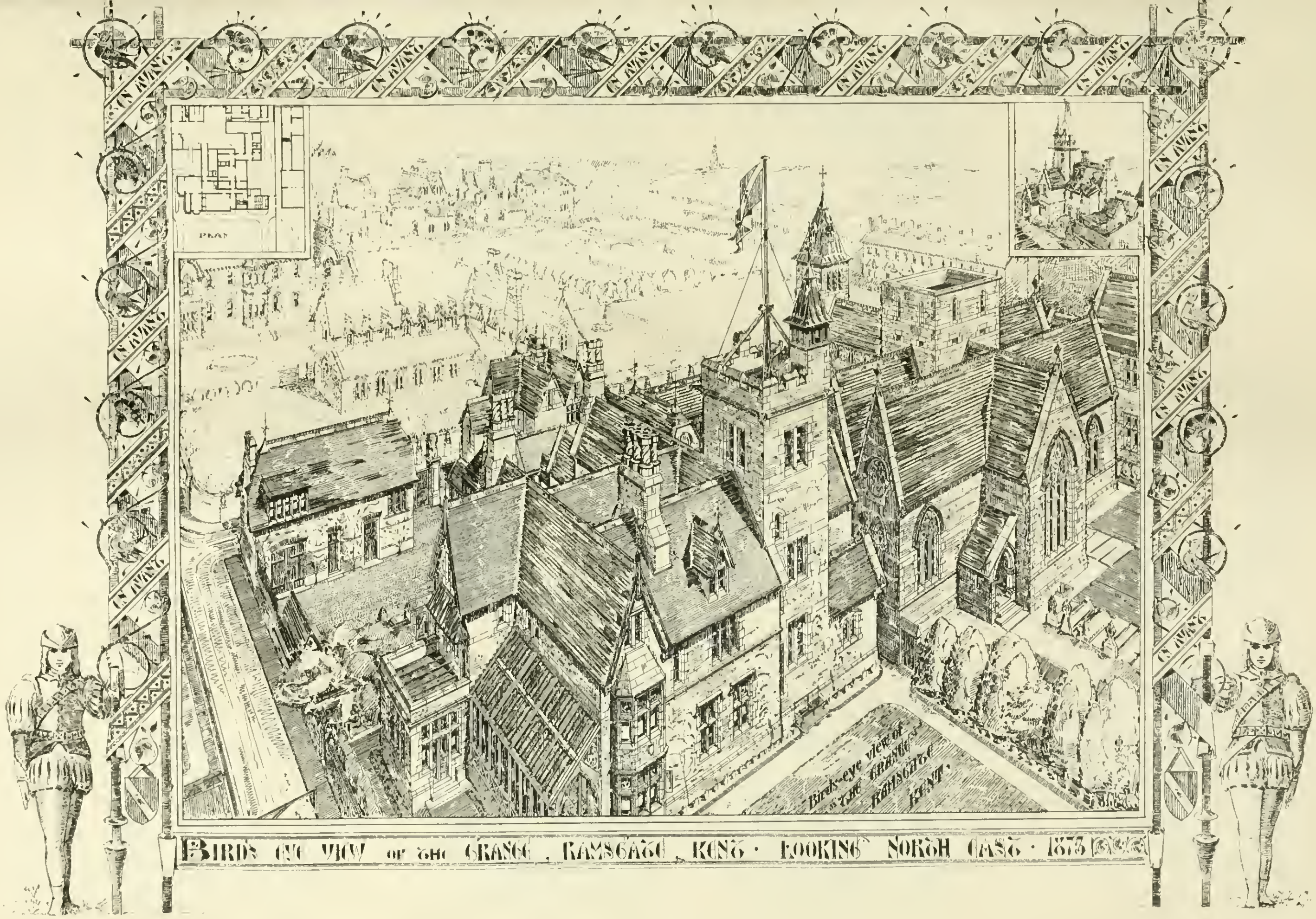
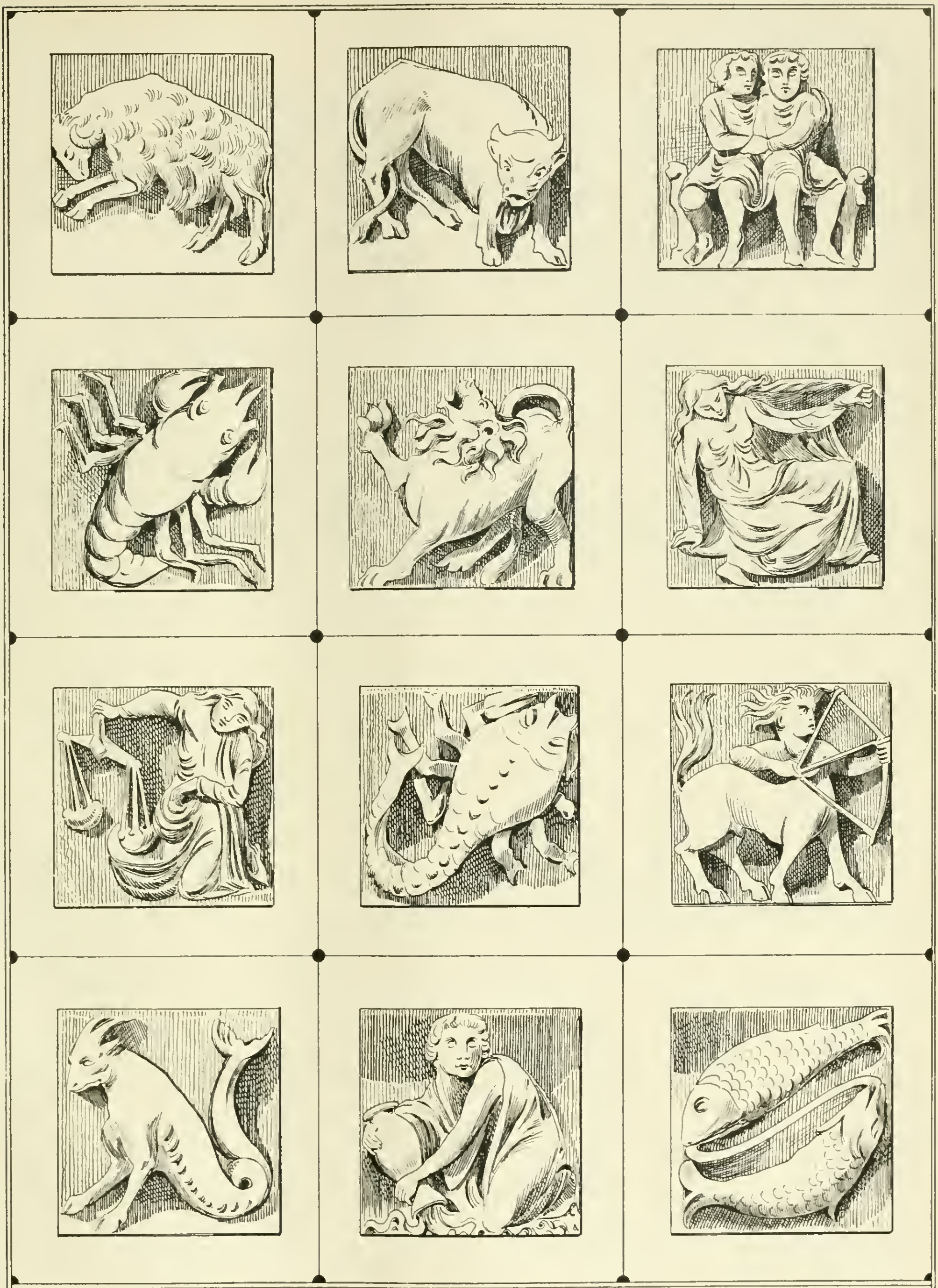
BIRDS'-EYE VIEW OF THE "GRANGE", RAMSGATE, KENT. LOOKING SOUTH-EAST
Pugin 1872


PLAN
Birds-eye view of the Grange Ramsgate Kent.

BIRDS EYE VIEW OF THE GRANGE, RAMSGATE, KENT · LOOKING NORTH EAST · 1873

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



Signs of the Zodiac Cathedral of Carcassonne.
M. Viollet-le-Duc Architect.

Maurice B Adams Delt

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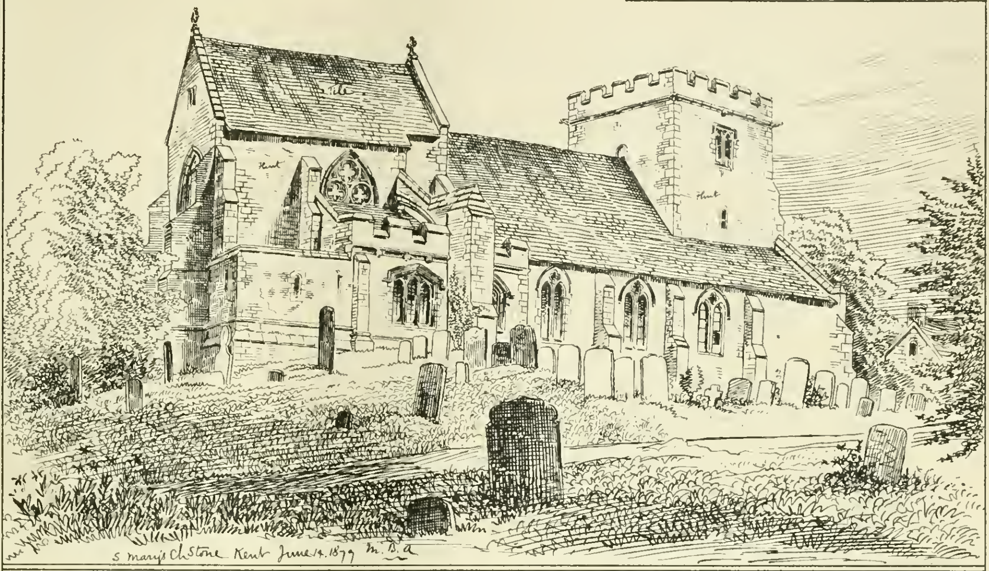

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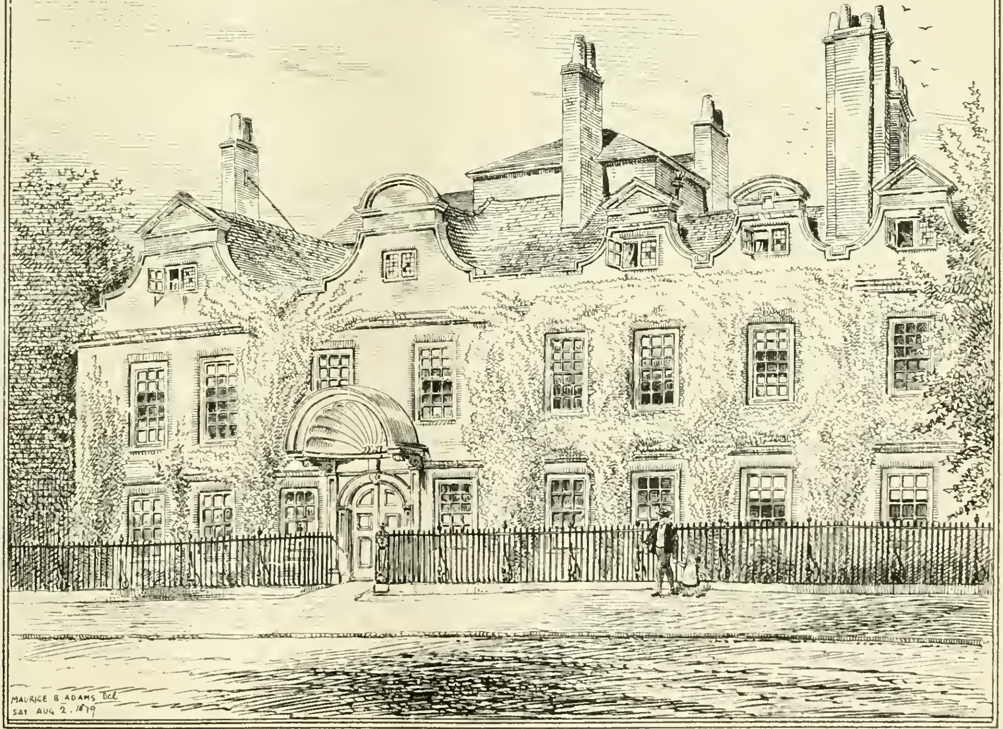
Royal · Architectural · Museum · Sketching · Club · Excursion · Trips ·

FAIRFAX HOUSE High St·
PUTNEY



MAURICE B ADAMS Del
SAT AUG 2. 1879

Lithographed & [illegible] Akerman, 6 Queen Square W.C

MEMORIAL IN ST. PANCRAS GARDENS.

THE memorial which we illustrate in our present number has been erected by the Baroness Burdett-Coutts. Many of our readers will know the site, and remember the dilapidated condition the burial grounds of St. Pancras and St. Giles were in a few years since, and the difficulties of preserving, with due respect, the ground which had afforded for centuries a resting-place for some of the most illustrious personages of their age—English, French, Spanish, and Italian. The last interment took place in 1853, and from that time to 1875 the burial grounds remained in a neglected state from want of funds wherewith to lay them out and preserve them in proper order. The Vestry of St. Pancras had an excellent object in view when they proposed the conversion of what was, particularly in the midst of a populous district, an unsightly spectacle, into the present memorial gardens. The movement was warmly approved by the ratepayers and the public generally, and also by her Ladyship and His Grace the Duke of Norfolk, who joined heartily in successfully opposing the Midland Railway Company in 1875 in their endeavour to pass a Bill in Parliament to acquire the residue of these grounds for railway purposes. The sympathies of the baroness with the project for utilising the grounds for the recreation of the public, especially of the poor in the neighbourhood, and for the preservation of the names of those eminent persons whose remains have been buried therein, have been practically evinced by the erection of a memorial to fittingly record the names of some of those celebrities whose memory should be handed down to posterity. The gardens were opened on the 28th June, 1877, by Sir James McGarel-Hogg, M.P., Chairman of the Metropolitan Board of Works, and on the same day the baroness laid the foundation-stone of the memorial, now completed and depicted by us. The superstructure, which is in the Early Decorated style, consists mainly of Portland stone with four marble tablets, and clustered granite columns at the angles. The tablets are surmounted with reliefs representing St. Pancras and St. Giles, also Night and Morning, by Signor Fucigna. On the tablet under the dial are inscribed the Beatitudes and the following lines:—

> "Here in Christ's acre where this dial stands,
> With pious care and borne by reverent hands,
> Lone wanderers garnered in from east and west
> Among the home-loved lie in solemn rest;
> Severed in life by lineage, race, faith, clime,
> They bide alike the last soft stroke of time;
> And when God's sun, which shone upon their birth,
> Ends his bright course and vigil o'er the earth,
> When o'er this disc that day's last shadows flee,
> And 'death no more divides, as doth the sea,'
> The dead shall rise—retake the life God gave,
> Creation's Saviour bless earth's opening grave,
> Thy word hath writ the blest—no conscience clear
> In thought and word, all must Thy judgment fear—
> Only our own wild words, which fashioned prayer
> When life was parting, still move the ambient air,
> Pleading that God, who made, will grant that we
> May with the pure in heart the Godhead see."

On the reverse side the tablet is thus headed:—

> "These grounds, formed out of the burying-ground of S. Giles and the churchyard of S. Pancras, are assigned for ever to the loving care and use of the parishioners.
>
> "Hereon are inscribed some names, English and foreign, which have an interest for all time.
>
> "This dial is, however, especially dedicated to the memory of those whose graves are now unseen, or the record of whose names may have become obliterated."

The remaining portion, and the other two tablets, record names of eminence, alphabetically arranged, including those of Sir John Soane, John Flaxman, John Walker, author of the "Pronouncing Dictionary," Peter Pasqualino, Thomas Mazzinghi, Father O'Leary, several members of the Norfolk family, Sidky Effendi, Turkish Ambassador to this country, Count D'Hervilly, Charles Louis Victor De Broglie, and Archbishop Dillon. The terraces, which are constructed to form flower-beds, are mainly of red Mansfield stone, worked at the quarries. The panels of the two upper terrace tiers contain flowers—with butterflies as the emblem of immortality—in mosaics; the top one has panels in relief, representing the four seasons, by Messrs. Wills, of Euston-road. The bottom tier panels are also in mosaics. The whole of the mosaics have been executed by Messrs. Simpson and Sons, of St. Martin's-lane. The whole is inclosed by kerb and iron railing with gates; the latter by the St. Pancras Iron Works Company. The contract has been carried out by Messrs. H. Daniel and Co., of Highgate, under the direction of Mr. George Highton, of 79, Elm Park, Brixton, architect, and has cost upwards of £2,000.

RUGBY CHURCH.

THE reconsecration of the parish church of St. Andrew, Rugby, took place on Wednesday week.

Originally, St. Andrew's was but the church of a little village; and consisted merely of a nave of four bays with aisles, a chancel, and a western tower. It was of the plainest and most inornate Perpendicular. In 1814, with a view to meet a pressing demand for more accommodation, the nave was lengthened eastward by two bays, to which was added a tiny brick chancel. In 1831 the south aisle was pulled down, and rebuilt on a larger scale. This addition was not without interest, as being one of the earlist efforts of Mr. Rickman. It was in what the *Guardian* calls "Starved Early English," and its not inelegant arches rose from slim cast-iron columns. For the rest, the church appears to have been a fine specimen of arrangement as it was before the days of the Cambridge Camden Society. It was filled with pews, and there were galleries around the west, the north, and the east sides, crossing thus the chancel arch, and leaving only Mr. Rickman's aisle free. Rugby was not, however, wholly given up to architectural barbarism, for in 1852 Trinity Church, a spacious and handsome cruciform structure, with a central lantern, was built as a chapel-of-ease to St. Andrew's. It is of the Geometrical period of Decorated, and is the first conspicuous object that meets the eye of the traveller whom business or curiosity induces to break his journey at "Mugby Junction." The late rector, the poet John Moultrie, made an effort to rebuild St. Andrew's, and Mr. Butterfield was actually appointed architect; but the town was not then ripe for the scheme, and it was dropped.

Mr. Butterfield's connection with Rugby did not come to an end, for he made a series of important additions to the school, of which they now constitute the chief feature. After the appointment of Mr. Moultrie's successor, the Rev. John Murray, in 1874, the project of rebuilding the parish church was revived, and was prosecuted by the new rector with extraordinary vigour and success. Indeed, no less a sum than £19,000 has been raised without the smallest assistance from any society; but though this large sum has been spent on the fabric there still remains a great deal to be done. The tower and spire have yet to be completed; a vestry is still needed; there is only an apology for an organ; and there is no stained glass with the exception of a single-light window at the end of the south aisle. The works were begun in March, 1877, when Bishop Temple, a former Head Master, laid the first stone. The old nave, which is in future to be known as "the Moultrie aisle," in commemoration of the late rector's incumbency of half a century, forms the nucleus of the whole design; but there is, after all, scarcely anything left of it. The two eastern arches on the north side, which were built in 1814, and were much loftier than the rest, have been pulled down and replaced by others uniform with the old ones. On the arcade thus rectified has been constructed a clerestory, with a three-light window in each bay. The four western arches, the nave ceiling, and the tower are thus all that remains of the old church. The north aisle has been entirely rebuilt. In place of Mr. Rickman's aisle Mr. Butterfield has constructed a new nave of four bays, and to the north of that an aisle. The Moultrie aisle leads to a transept, at the end of which is to be a new tower and spire. This last will rise to the altitude of 190ft.: and it is expected that it will group very picturesquely with the old tower. At present, however, the new one is temporarily roofed in at the height of the transept. The opposite transept is intended to serve as an organ-chamber. The choir-stalls are placed in the crossing, and beyond them is the sanctuary. The new nave and chancel are under one roof, the former 76ft. and the latter 44ft. in length. Their width is 24ft. 6in. The entrance is by north and south porches and a west door. The style is that of the 14th Century. Entering by the west door the *coup d'œil* is very striking on account, not only of the fine proportions of the building, but of the boldness and success with which Mr. Butterfield has made use of constructional polychromy. The roof of the nave and chancel is 60ft. in height. It follows as nearly as possible the line of the slates, and the principals are of very unobtrusive design; but it is richly coloured from end to end. The ceiling of the Moultrie aisle is perfectly flat, and divided into square panels, which are also painted. The masonry is of red and white stone, and the aisle walls are, as it were, wainscotted to the window sills with coloured tiles. The glass is slightly tinted with green, but with a margin of white round each light and compartment of the tracery. The choir is inclosed by low screens and gates of walnut and oak, with iron crests painted and gilt. Between the nave and chancel there is a lofty stone arch carrying a carved and battlemented wall, ending at the level of the wall-plate. From the centre rises a large, slightly floriated stone cross. The piers which support this arch, instead of being round, like the rest, are oblong, with semicircular responds, and are pierced with diagonal squints. The altar stands at an elevation of seven steps. Behind it there is a reredos of alabaster and Devonshire and other marbles. It consists of a centre gable-piece rising into the east window, and enshrining a large cross of statuary marble, coped and slightly floriated. There are also side-pieces, composed of shafts, arches, and tracery. Portions of the north and south walls of the sanctuary are left in rough brickwork, to enable the design to be carried quite round the sanctuary.

The pulpit, which is of elaborately carved oak on a marble pedestal, is placed against the east pier, between the two naves. The church is filled with low wooden benches, and, according to the sentence of consecration, it should seat 800 persons, but on an emergency it could easily accommodate 1,000.

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ST. MARY'S CATHEDRAL, EDINBURGH.

THIS new cathedral church was opened with much ceremony on Thursday last. As carried out from the designs of the late Sir G. Gilbert Scott, the plan consists of a choir of two great, sub-divided by groining into four minor bays, with north and south aisles, transepts projecting one bay, with east and west aisles, nave of six bays, north and south aisles, a spire at the intersection of transepts, and two western towers; to the north of the north chancel aisle is the library, and from the east bay of this aisle a vaulted passage will lead to the chapter-house, hereafter to be added. The choir is 60ft. 9in. long by 29ft. broad, with aisles 16ft. wide, and from the floor to key of stone vaulting the height is 58ft. The transepts are 35ft. 4in. long, and 30ft. 9in. broad, with aisles 13ft. 7½in. wide, and the nave is 146ft. 10in. long, and 33ft. 9in. wide, with aisles 13ft. 7½in. wide. The vaulting in nave and transepts is of oak, 71ft. above floor, while at the centre crossing, the height is 66ft. The central tower rises in a square mass through the roofs to a height of 142ft. from the foundations, where it breaks to the octagonal form with pinnacled turrets at the angles, and ends in a cap and iron cross at a further height of 133ft. The western towers will reach, with their spires, the height of 209ft. 9in., but at present are carried to the commencement of belfry stage, 80ft. from the pavement. The style adopted is an early phase of the Early Pointed, strictly treated, to the exclusion of the round arch and other Transitional features. The principal materials are freestones; the facing material, both without and within, is rubble of white Hailes stone set in very narrow courses averaging 4½in. high. The dressings are of Polmaise sandstone, chisel dressed, warm grey in tone. The spandrels of the large arches are in polished ashlar of Bath stone, and the principal shafts are of red granite from the Shap quarries. The roofing is of slates of a greenish tint from Craiglea quarry, Perthshire. The reredos and chancel screen are of richly-veined alabaster, and will be executed by Messrs. Farmer and Brindley, London; the pulpit is of a dull red sandstone from Annan. The altar rail, and that separating choir from aisles, have been worked in wrought iron by Mr. Skidmore, of Coventry. The floors are paved with tiles by Messrs. Godwin of Lugwardine, Hereford. The west window is to be filled with stained glass, in course of preparation by Messrs. Clayton and Bell, of London. The other stained windows are all by Mr. Kemp, and include some in the north and south aisle of nave forming part of a scheme portraying Our Lord's Life, with His parables and miracles, and others in the baptistry, appropriate to its purpose, as Noah and the Ark, St.

John the Baptist, Moses and the Red Sea, and Philip the Deacon. The east window of the north aisle of chancel has been given by the workmen, in memory of Sir Gilbert Scott. The organ is in the north transept, and has been constructed by Mr. Willis, of London. In the tower is a peal of ten bells, of which the largest weighs 42 cwt., cast by Messrs. Taylor, of Loughborough. The contractor was Mr. Booth, who took the work at £87,830, but the rise in wages, unexpected difficulties in foundations, the organ and other additional fittings have raised the total expenditure on the building, without western spires and chapter house at present to be left over, to about £110,000. Mr. Morgan has acted as chief clerk of works.

The whole scheme has been worked out during the past eight and a half years. Miss Mary Walker, the survivor of two maiden sisters, died in March, 1871, leaving, it will be remembered, their real and personal estate for the benefit of the Episcopal Church of Scotland, including the erection of a cathedral church on the Coates estate, in Edinburgh, the plans for which were to be invited from four to six architects. Three English and three Scotch architects were selected for the competition—Sir G. G. Scott, Mr. G. E. Street, Mr. W. Burges; and Mr. A. Ross, Mr. Lessels, and Messrs. Peddie and Kinnear; and that of Sir G. Scott was finally selected. The foundation-stone was laid on May 21st, 1874, and the nave was opened for worship on Jan. 27th last. The spire was capped on June 6th.

We have frequently described the progress of the building in detail, and refer our readers to the first volume for 1873 (Vol. XXIV.), for details of the competition and the controversies it excited, and to "Notes from Edinburgh," in our issues for July 5, Nov. 8, and Dec. 20, 1878, and Sept. 19 last. Numerous illustrations of the competition designs were published in Vol. XXIV. just alluded to. We may particularise that Sir Gilbert Scott's original design was illustrated on Jan. 31 by a north elevation which, it will be seen, has not the last bay of nave and western towers, subsequently added by request of the Walker trustees. In the following issue (Feb. 7) we published elevations of two bays of nave, and two bays of choir, and Sir Gilbert Scott's plan, and in a week later (Feb. 14) a perspective from south with the western addition, and also an interior perspective. Mr. G. E. Street's design in the same competition was illustrated on Jan. 10 (general perspective and two bays of choir), and 17 (north elevation and plan); Mr. W. Burges's design, Feb. 14 (west elevation), and 21 (transverse sections, bay of nave); March 14 (north elevation and longitudinal section), and Mr. A. Ross's design. Jan. 24 (south elevation), Feb. 14 (west elevation), March 21 (east elevation).

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EARLY SCOTTISH CHRISTIAN ARCHITECTURE.

On Thursday week, in the Freemasons' Hall, Edinburgh, Mr. Joseph Anderson, as Rhind Lecturer, delivered the sixth and last of his course of lectures on "Scotland in Early Christian Times."

Mr. Anderson, continuing his account of existing relics of the early Celtic Church, began with an account of the crozier of St. Fillan. He described its external appearance in considerable detail, and went on to remark that on being taken to pieces it was found that the outer case had been constructed to contain the original crook. On examination of the venerable object which had been deemed worthy of such enshrinement, it was found that the filigree plaques, now the chief ornaments of the outer case, had been first the ornaments of the copper crozier inclosed within it. Before this was stripped of those plaques it must have been a work of art of no common order. Its form differed from the crozier of European type, just as the bells which had been described differed from those now in use. He had shown that the four-sided bells were the bells of the Celtic Church; he had now to show that this peculiarly curved form of crozier, with pendant portion at the end of the curve, was the crozier of the early Celtic Church. The object was found represented of this peculiar form on sculptured stones, and on the side of the doorway of the round tower at Brechin; and representations of similarly formed croziers occurred in Irish MS. and elsewhere. It was thus demonstrated that this type of crozier belonged to the early Celtic Church as certainly as the peculiar type of books and bells that had been described; and that it belonged to the Celtic Church exclusively might be safely assumed till an example not Celtic in its derivation had been produced. The history of the St. Fillan crozier was divisible into two periods, in the later of which it appeared as an enshrined relic in possession of hereditary keepers, while in the former it was the staff of office in the monastery of Glendochart. Mr. Anderson referred at some length to some other Scottish relics, and in conclusion said here they paused for a time, and were in a position to realise the general nature of the investigation on which they had entered. They had traced the types of the early churches back to a type truly primitive in form and construction; they had seen that the dwellings of the founders were beehive cells or wattled huts, as mean in character and rude in construction as could be imagined; yet that their occupants were men exhibiting a quality of culture and form of civilisation which it might be difficult for the present generation to estimate at their true value in relation to their own, but which could not be spoken of in terms of disparagement. The relics of that culture still extant exhibited a feeling for decorative art, a faculty of design and skill in the technical processes of art workmanship, which had seldom been surpassed; and in all the productions which had come under notice, whether rude or refined, they had marked the presence of features and characteristics peculiar to this special area, because they were the expression of the individuality of the Celtic character. Throughout the course of lectures just closed, the features and characteristics which marked that individuality of character had been for the most part common to Scotland and Ireland. In his next course of lectures it would be his duty to deal with objects and classes of objects which exhibited, in a still more distinctive manner, features and characteristics which were the expression of an individuality of character developed on the soil of Scotland itself.

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LEEDS ARCHITECTURAL ASSOCIATION.

The first ordinary meeting of the winter session in connection with this association was held last week at the Mechanics' Institution, when the committee's report was read. The result of the competition for the prizes is as follows:—The best set of measured drawings—The silver medal of the association to Mr. G. Beaumont. For sets of sketches produced at the class meetings—First prize to Mr. W. Riley; second prize to Mr. H. Brown. Figure drawing from the cast—Prize to W. Riley. Designs for Mechanics' Institution for a small town—Mr. W. Riley's and Mr. J. Jackson's designs were judged equal in merit, and they were awarded the first and second prizes, to be divided between them. For drawing of antique oak cabinet—Prize to Mr. W. Riley.

In the absence from town of Mr. Crawford, the President, Mr. George Corson, Vice-president, occupied the chair, and delivered the opening address. Dealing chiefly with the subject of "Competition," he remarked that the principle of competition was good, although its working out was often very bad. Like Byron's Corsair, it had "one virtue linked with a thousand crimes." There was no confidence to be placed in a fair adjudication by the promoters, as he would call them, unless they first employed an architect of some standing to draw up the instructions and conditions, and bound themselves to submit all the designs to him, and to abide by his decision. In important competitions, it might be better to refer the plans to three architects. If that method was not followed out, and the promoters adjudicated, a door was left open for all sorts of blunders, and worse. They were taken captive by a pretty drawing, let the plan be what it might; or an architect had friends in court whose sharp eyes pierced through mottoes, and knew the best design at a glance. Sometimes, even, it was whispered that the architect was fixed beforehand, and that the competition was a mere sham to blind outsiders. And, perhaps, at the last moment, the promoters grew faint-hearted, and declined to build at all. In illustration, he referred to a case in which he was himself concerned—the Roundhay Park competition, in which the first prize of 200 guineas was awarded to him. The greater part of that sum was expended in the preparation of drawings, for the premium was not the object of the competitors, their hope being to obtain the commission for the work. What was the result? Very little had been done, and that little had been done under the management of the Borough Engineer and his assistants. Plainly, the result of that competition was not only to deceive the competitors, but to throw away the £450 awarded in premiums. The system of unlimited competition was bad, because it involved such an immense loss in the aggregate to the competitors. It was no unusual thing to have from 20 to 40 architects competing, when only one, of course, could obtain the commission. Two prizes might be awarded, but these would barely pay expenses out of pocket, and it was not always that a second or third prize was given. Sometimes all but the one man must be left losers by the sum expended on their drawings. If their profession was a close one, with admission only by passing an examination, and were the members bound by certain rules, the breaking of which would involve expulsion from the ranks, competition might be made an unmixed benefit instead of an extremely doubtful one. Mr. Corson proceeded to sketch the rules which he would suggest for limited competitions. The motto system was bad, for in most cases the motto was only a transparent veil beneath which the author could be seen plainly by those conversant with his style. The system was liable to many abuses, and competitors were not always free from the imputation of having divulged their motto to persons concerned in the adjudication.

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AMERICAN ARCHITECTURAL THIEVES.

We mentioned, on page 489, the trouble of Mr. Glendell, an architect and builder of Philadelphia, who, having built himself a porch in which he took pleasure, found that a fellow-builder had surreptitiously made drawings of it, and was copying it in one of his own houses; and who, therefore, had appealed for an injunction against his imitator. The injunction has been refused by the court, the judge ruling, in his opinion, that the essential point in the case was the question whether the plaintiff, who had taken out no copyright, had actually published his design, in which case he was entitled to no protection. Upon this question the court said: "To publish is to divulge, to utter, to make known to the public, that which was before private or unknown. To say that placing or erecting a design or work upon the highway, with an unrestricted view, without notice of any privacy for a period of three years, was not a publishing of it, would be a singular and unwarrantable denial of the legal meaning of such a term. Any free exhibition of a work of art has been determined a publication, as well as the printing and circulating of a book. A dedication by the author to public use is not required to make the design public. Any way by which the novelty or design is communicated or made known is a publication." The decision was, of course, a foregone conclusion. The *American Architect and Building News* thinks "There is no question that architects, if they were called upon to choose between keeping their work out of sight and receiving the advantages of publicity with the risk to which they are exposed of being defrauded by copying, would choose the publicity. These appear, in the present condition of jurisprudence, to be the only alternatives open to them, and it is not likely that any other will be provided—except so far as they may avail themselves of the copyright, which they are not likely ever to do to any great extent. The only other defence to which they can look is in public opinion, and the growth of a common delicacy about appropriating the fruits of other men's labour, which we cannot expect to see advance very rapidly, if it comes at all. There is, besides, for the cleverer men, the consolation, so far as it goes, of knowing that the better worth copying their work is, the more difficult it is to copy, and the more flattering will be the difference between the copy and the original."

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The City Lands Committee of the Court of Common Council propose to erect a new hall and library for the use of the Fellows of Sion College, on a portion of the vacant land at the Blackfriars end of the Victoria Embankment, and adjoining the new City of London School, to be built from Messrs. Davis and Emmanuel's designs.

PICTURES AND THEIR CRITICS.

On Wednesday evening, Mr. J. Thackray Bunce delivered the second of his series of lectures on "Pictures and their Critics," before the Birmingham Royal Society of Artists. The lecturer commenced his lecture by remarking that the dictionaries defined a critic as one who was able to discern, to distinguish, to decide, to judge. The critic was a useful person—as useful as a dose of nauseous physic—but men did not like him any more than they liked the drugs they were obliged to swallow. Unless, indeed, the critic was himself endowed with the creative faculty—and this occurred only in instances extremely rare—those who were subjected to his operations regarded him rather as a detractor or a puffing machine—as he condemned or praised them—than as the teacher and guide he professed to be; while those who respected his opinions at second-hand, and who but for him would know nothing, were pleased to believe that he had merely served to put into rough shape reflections which they could have made without him, and could have expressed more happily. If this were true of critics of literature, it applied with still greater force to critics of art. In England art criticism was a plant of recent and not too vigorous growth. It was scarcely more than a century ago since it began. Before Horace Walpole's "Anecdotes of Painting" we had no criticism of any serious or settled kind; and even Walpole was much more of a biographer than a critic, though here and there in his notices of artists he dropped in observations which still had value in the estimation of the works he described. The fugitive pamphlets of the close of last century aimed chiefly at the Royal Academy and its members, and never in any single instance rose to the dignity of criticism. The passing notices in the journals, until fairly within our own time, were rather complimentary paragraphs than serious critiques of the works exhibited. The discourses of the Academicians, indeed, lifted the art of criticism to a higher level; but these dealt either with the principles of art, with technical rules, or with the works of the Italian masters. Northcote's "Conversations," recorded by Hazlitt, were the earliest essays in free and intelligent criticism; and to these might be added some of Hazlitt's own essays. But it was not until the appearance of the first volume of Mr. Ruskin's "Modern Painters"—little more than thirty years ago—that we had a serious and adequate endeavour to raise the criticism of art to its true level: and even now, despite a host of followers and a crowd of "modern painters," it stood unsurpassed, unapproached, alone. Since Mr. Ruskin led the way we had plenty of writers who made criticism their trade. Speaking of the different kinds of critics, the lecturer described several classes, including the journalists, Of these he remarked that their means and their range were limited. As a rule, they did not know much of art; and the conditions under which they worked were scarcely calculated to bring out what they did know. An exhibition opened; the critic was turned loose into it just a day before the public; he took a rapid run round the rooms, made a few hasty notes—which sometimes he found he could not read—and then away he went to give his account of it—one column, two, three, four, or five, as the case might be. What could he do but furnish a sort of running catalogue?—thin and poor, no doubt; foolishly "smart" very often; usually full of blunders, of crude judgment, of unwise praise, or unmerited blame; yet, it must be added, generally honest according to his lights, and seldom, very seldom, touched by conscious malice. The worst of this kind of critic was that he would try his hand at fine writing, and sometimes he got punished for it by a sharp wound to his own self-love. The lecturer then alluded to those critics who wrote books on art, the professors of what was called the Higher Criticism, and whose doctrine was—first, that pure art was pure sensuousness, and as consequence of this, that any admixture of moral, spiritual, or intellectual meaning signified a lower form; secondly, that this pure sensuousness was admirable and desirable in itself, apart from any use we might put it to; and thirdly, that cultivation of the imagination and intellect did the best it could for us when it left our souls, like the leaves of the sensitive plant, ready to give a droop at every passing breath of emotion. —Mr. Bunce then proceeded to speak of what a critic ought to be. He must be clear in his views, and plain and intelligible in expression, and above all he must be honest, without prejudice, artistic or personal, truthful in heart and word, and prepared too—and this was perhaps the highest form of critical honesty—to risk misconstruction alike as to motive and as to opinion.

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RAIN WATER AND DOMESTIC WATER SUPPLY.

The following table* showing the daily yield of water from roots of various sizes with varying rainfall may be useful at times to many readers:—

Area of House 10ft. × 20ft. or 200 sq. ft.

Mean rainfall.	Loss from evaporation, &c., per cent.	Requisite capacity of tank.	Mean daily yield of water.	Mean daily yield of water in wettest year.	Mean daily yield of water in dryest year.
in.		cubic feet.	gallons.	gallons.	gallons
20	25	100	4·3	6·7	3·2
25	20	135	5·7	7·5	3·9
30	20	145	6·8	9·4	4·5
35	20	155	7·9	11·0	5·0
40	15	165	9·7	13·1	7·2
45	15	170	10·9	14·2	8·8
Area of House 15ft. × 20ft. or 300 sq. ft.					
20	25	150	6·4	9·9	4·8
25	20	200	8·6	11·3	5·6
30	20	225	10·3	14·2	6·9
35	20	235	12·0	16·7	7·7
40	15	245	14·5	19·6	10·8
45	15	250	16·4	21·4	13·1
Area of House 20ft. × 25ft. or 500 sq. ft.					
20	25	250	10·7	16·6	8·0
25	20	335	14·3	18·7	9·7
30	20	375	17·1	23·6	11·4
35	20	390	19·9	27·7	12·7
40	15	405	21·2	32 8	18·0
45	15	415	27·3	35·7	21·8
Area of House 20ft. × 50ft. or 1,000 sq. ft.					
20	20	500	22·8	30·1	15·5
25	15	665	30·3	40·0	20·6
30	15	740	36·4	50·3	24·4
35	15	785	42·4	59·0	27·0
40	15	815	45·6	62·0	34·1
45	15	835	48·5	63·6	39·1
Area of House 25ft. × 80ft. or 2,000 sq. ft.					
20	20	1010	45·6	60·2	31·0
25	15	1330	60·6	80·0	41·2
30	15	1480	72·7	100·5	48·7
35	15	1570	84·8	118·0	54·0
40	15	1630	91·1	123·0	67·9
45	15	1700	96·9	126·6	78·2

Particulars of Tank or Well.

Capacity.		Dimensions.			
Cubic feet.	gallons	Square length of side.	Circular diameter.	depth.	Approximate cost.
		ft. in.	ft. in.	ft. in.	£ s.
100	624	4 0	4 6	6 6	5 0
125	780	4 0	4 6	8 0	6 5
150	936	4 6	5 0	7 6	7 10
175	1092	5 0	5 9	7 0	8 15
200	1248	5 0	5 9	8 0	10 0
225	1401	4 0 4 0	4 6 4 6	7 0 7 0	11 5
250	1560	4 0 4 0	4 6 4 6	8 0 8 0	12 10

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* Prepared by H. Sowerby Wallis, F.M.S., and contributed to the Sanitary Congress at Croydon, as an appendix to a paper read 24th October, 1879. (See p. 518, in last week's issue of the Building News.)

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Special services have been held in the Congregational chapel, Billericay, Essex, to mark the erection of a new pulpit, Communion dais, and organ. The architect is Mr. Chas. Pertwee, of Chelmsford.

COMPETITIONS.

Cardiff.—On New Year's Day, designs will be received by the Town Council of Cardiff for a new Free Library Museum and School of Art which it is inteded to erect in Trinity-street on a site adjoining St. John's Churchyard, with a rear frontage to Working-street. It will thus be seen that the unusual advantage is at once obtained of a north light all along one main frontage, which is about 110ft. long, so that no difficulty should be found in effectively lighting the class and museum rooms of the proposed building in the most effective manner. The frontage to Trinity-street and Working-street are 55ft. and 52ft. respectively, Looking through the conditions, we learn that only the very small sum of £8,000 is intended for the entire cost of the buildings, which are limited to 50ft, from street level to top of cornice. As a separate clause is devoted to the binding condition about cost, wherein all competitors are distinctly given to understand that a guarantee must be given by every competitor that his design can be completed to the satisfaction of the Town Council for the sum specified, we certainly trust that the council will consider themselves bound to this in selecting their design. Indeed unless this be clearly held by the awarding body, those competitors who endeavour to give a building which may be built for £8,000 will stand no chance against those who supply designs of a more showy and costly character, as was done in the case of the late Ipswich Post Office competition, which we only quote as a recent instance of a hundred similar cases. The premiums offered are £100 for the best and £50 for the second best designs. The drawings are to be to an eighth scale.

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SCHOOLS OF ART.

Gateshead.—Last week the prizes gained in the Science and Art Classes in Gateshead were distributed. The report showed that the following numbers of students had passed in the classes:—Machine construction, 32; building construction, 5; applied mechanics, 21; steam, 22. The average nightly attendance had been 33. The total number of Queen's prizes gained was 28; local prizes, 14; certificates, 80. The total number of individual students examined was 48. The percentages who passed were:—Machine construction, advanced, 100 (10 students were examined, 9 of whom passed 1st class, and 1, 2nd class); machine construction, elementary, 80·8; building construction, elementary, 71·5; applied mechanics, advanced, 62·5; do. elementary, 58·62; steam, advanced, 50; do. elementary, 66.

High Wycombe.—The annual meeting in connection with these science and art classes was held on Wednesday week. The report spoke of an increasing number of students in drawing, chemistry, and electricity, but stated that the results of the May examinations had not been so favourable as in former years, owing to the raising of the standard. In drawing, ten certificates and one prize were obtained.

Huntingdon.—The annual distribution of prizes and certificates in connection with the Science and Art Classes at Huntingdon took place in the Town Hall on Tuesday evening. Mr. A. W. Marshall (Mayor, presided, and in the course of his address on the value of Science and Art night classes for young men, said, at the risk of expressing an opinion which he believed was unpopular, that he was strongly in favour of opening Museums and Picture Galleries on Sunday afternoons. He believed it would have an elevating and refining influence on those who visited them. Mr. Buckmaster delivered an address, and the Mayor distributed the prizes and certificates.

Nottingham.—The annual meeting of the friends and students of the Nottingham School of Art took place on Friday last. Mr. J. S. Rawle, the able head-master of the school presented, as usual, a very gratifying report. He said: "The zeal with which our students have attended to their studies has been unabated, as is shown by the fact that 4,689 works, consisting of drawings, paintings, designs, models, &c., were executed by them during the past twelve months, giving an increase of 1,658 works over the number submitted for examination last year. There were 84 frames of our advanced works selected by the examiners for exhibition in London, being about one-twelfth of the entire number exhibited from all the schools in the kingdom—the highest proportion ever yet selected for this honourable distinction from any one school The previous year 67 of our works were selected, or a proportion of one-sixteenth of the whole number exhibited. The Nottingham School obtained one of the 10 gold medals, 6 of the 45 silver medals, 7 of the 77 bronze medals, and 9 of the 168 Queen's prizes, making a total of 23 awards, or one more than last year. Our awards this year are much higher in value, the number of medals being 14, against 8 last year; or two more medals than have ever yet been obtained by any school in the kingdom, excepting South Kensington. We have this year obtained nearly one-ninth of the entire number of medals, and about one-eighteenth of the Queen's prizes. Four students obtained 'Free Art Studentships,' being ten less than last year. This diminution in the number is inexplicable, as we have, in every grade of examination, exceeded the results of last year. It must be that the Science and Art Department has decided to grant fewer of these studentships, which is much to be regretted, as they proved a great incentive to students. There were 83 works by 59 students marked by the examiners as worthy of third-grade prizes; 23 of these works having afterwards obtained national competition awards. Last year 45 students obtained 58 third-grade prizes. In the advanced third-grade examinations, held last May and June, we were exceptionally successful, especially in painting still life, &c., from Nature. Total awards, seven excellents, six goods, and twenty-one passes—altogether thirty-four successes. Last year there were two excellents, seven goods, and thirteen passes—total, twenty-two successes. Each student who obtains an 'excellent' is entitled to a 'Queen's prize,' in addition to those gained in the international competition. These examinations are of a high standard, and the various works have to be executed in a given time. In the second-grade examinations, in freehand drawing, practical geometry, perspective and model drawing, 110 candidates were successful in 147 papers, and 35 papers were marked 'excellent.' Last year 90 candidates were successful in 119 papers, with 28 excellents."

CHIPS.

The burgesses of Liverpool, voting under the provisions of the Borough Funds Act, have endorsed the Vyrnwy water scheme. There were 21,974 votes for the scheme and 19,314 against it, giving a majority of 2,660. The project was strenuously opposed by a local association of house-owners,

The Ipswich Joint Museum and School of Art Committee met on Wednesday afternoon to open tenders for the new buildings about to be erected on vacant ground on the west side of High-street, in the town. Ten tenders were received, ranging from that of an Ipswich firm of builders, £6,990, to one from Lambeth, £8,167. We illustrated the selected design, which is by Mr. Horace Cheston, of 1, Winchester-buildings, E.C., on August 29th last.

The session of 1879-80 of the Institution of Surveyors will be opened on Monday evening next, at 8 p.m., by an address by the president, Mr. William Sturge.

Mr. Wm. Smart, president of the Ruskin Society of Glasgow, delivered an inaugural address on "John Ruskin, his Life and Work" in the Accountants' Hall, Glasgow, on Tuesday week. The Society has been in existence several months, and has at present three branches—in Manchester, Liverpool, and Glasgow. The objects are—first, to promote the study and circulation of Mr. Ruskin's writings; second, to form a centre of union for his friends; and third, to promote such life and learning as can fitly and usefully abide in this country. Membership is divided into two classes, members and associates.

Manchester and Salford District Provident Society, finding its offices as formerly arranged inadequate, has had them rearranged, and an entirely-new boardroom erected. The society has also lately extended the Convalescent Home, Lord-street West, Southport. The Manchester builders were Messrs. Elms and Evans, Greenheys. The builders of works at Southport were Messrs. Wishart and Irving, Southport. The society's architects, Messrs. Smith and Heathcote, 88, Mosley-street, Manchester, carried out both works.

Extensive business premises have just been completed in Henry-street, Dublin, for Messrs. W. Brunton and Co., from the designs and under the superintendence of Mr. Geo. Beator, of the same city.

Building Intelligence.

Bridgwater. — The Albert-street Schools, Bridgwater, were opened on the 4th. They are intended to accommodate 400 infants, 150 boys, and 150 girls. The buildings are lofty, well-lighted and ventilated. The offices are provided with Mould's earth-closets, and there are the usual conveniences. The style adopted is a simple treatment of Gothic. The walls are of local rubble, with Coombe-Down dressing, the interior being pressed bricks in bands and patterns 4ft. 6in. high, above that portion being plaster, with cornice at springing of roof. The cost, including site, fittings, and desks complete, is £3,674, being £5 4s. 11d. per head. The work has been carried out by Messrs. Chedzoy and Son, of Bridgwater, to the plans and under the superintendence of the board's architect, Mr. J. Parker, the borough surveyor.

Burnley.—On Saturday, Nov. 1st, the Church of St. Matthew the Apostle, Habergham Eaves, Burnley, was consecrated by the bishop of the diocese. The church, as at present erected, consists of nave (80ft. long), south aisle and chancel (40ft. long), and temporary vestry; the addition of north aisle, octagonal vestry, and tower over crossing being left until some future time. The church has been built substantially in local stone in the style of the 13th century, the interior of the chancel being lined with stone. The whole of the roofs are in pitch pine unstained, and are boarded and felted. The choir screens and stalls are in Dantzic oak. The parapet at the entrance to the chancel is in alabaster, and is continued in circular form as a base to the pulpit, which is in polished iron and brass. The floor spaces are covered with Godwin's tiles. The font is of Caen stone and alabaster. The church will seat 530 adults and has been erected at a cost of about £8,000, from the designs of Messrs. Wm. Waddington and Son, 5, Grimshawe-street, Burnley. It is expected that the Church of St. John the Baptist, situate about a mile from the above building, which is being erected from designs by the same architects, at a cost of £8,000, will be consecrated early next spring.

Castle Fields, Shrewsbury. — The new Church of All Saints was consecrated on Nov. 1st. It consists of a wide and lofty nave, with clerestory, north and south aisles, chancel with large north aisle, which is used as a choir and general vestry: also south chancel-aisle or organ-chamber. The porch is at the west end of the north nave-aisle, and there is another entrance on the south side. Eastward of the organ-chamber will stand the tower, the first stage only of which is built; this room, originally intended as a second vestry, is used at present as a chapel for the week-day services. The internal dimensions of the nave are—width, 30ft. in the clear between walls; length. about 77ft.; height, 58ft. to the ridge and 35ft. to the wall plate; width across nave and aisles, 58ft. The chancel is 40ft. long internally by 25ft. wide; and the chancel-arch is 40ft. high and the width of the chancel. The north aisle is separated from the nave by an arcade of four bays; the south by five bays. A low stone screen separates the chancel from the nave. There is an ascent of three steps at the chancel-arch; the altar is raised nine steps above the nave. The church, including the chancel, will accommodate 750 persons. The walls are built of Red Hill stone pointed internally, Shelvoke and Grinshill being used for the dressings, and blue Pennant (Bristol) for the columns in nave and chancel, and the shafts of the chancel-arch. The encaustic tiles in chancel floors were from Messrs. Maw and Co.'s works. Messrs. Bowdler and Darlington were the contractors for the nave and aisles, or portion first carried out; Mr. W. Bowdler took the contract for the rest of the work. Mr. W. Done executed the glazing, &c. The architect was Mr. Haycock. The total cost of the work has been about £6,000, exclusive of the gifts.

Colaton Raleigh, Devon.—The old vicarage house having been recently destroyed by fire, a new vicarage house is being built on an elevated spot to the rear of the old house, the latter lying low in the valley. The walls are of brick built hollow, and bonded with Jennings's bonding bricks, and the roof covered with red tiles. Hamhill stone is used for the ground-floor windows, plinth, string-courses, &c. The house will contain four sitting-rooms, four bedrooms, two dressing-rooms, bathroom, and three attics. The contractor is Mr. E. Carnell, of Ottery St. Mary, and the architect, Mr. R. Medley Fulford, A.R.I.B.A., of Exeter.

Ely Cathedral.—Miss Merivale, the daughter of the Dean, has just placed, in the presence of a large congregation assembled on the top of the Octagon, the last stone of the new pinnacles, the completion of the work begun by Alan de Walsingham. A new lectern has been placed in the cathedral under somewhat remarkable circumstances. In 1850 Professor Goertz, of Louvain, designed new stalls for the choir of Antwerp Cathedral. In 1851 Mr. John Sutton, fellow commoner and organist of Jesus College, Cambridge (afterwards Sir John Sutton), visited Goertz at Louvain, and inspected the stall work in the studio and cathedral; he was so struck with one of the stall-ends that he asked Goertz to make him a facsimile. Goertz took a saw, cut it off, and presented it to Mr. Sutton, saying he would have a copy made for the cathedral. Mr. Sutton brought the figure to Cambridge, but subsequently went to reside at Bruges, where he died. Before leaving he presented the figure to Mr. R. R. Rowe, who has now given it as a nave lectern to Ely. The figure represents a king placing his crown and money-bags under his feet and giving himself to a life of contemplation.

Frinton.—The parish church of St. Mary, Frinton, near Walton-on-the-Naze, one of the many edifices for which the claim has been advanced of being the smallest church in England, has just undergone restoration and enlargement. A partial restoration took place in 1868, when the nave was rebenched. The addition now completed consists of a new chancel, built on the lines of one blown down by the great storm of November 26th, 1703. It measures internally 13ft. by 11ft., is faced with rubble masonry and Bath stone dressings, and has an open timber roof, covered with plain tiles, stone copings and cross to east gable. The floor is paved with Minton tiles, and the east window is filled with stained glass, the subjects being the "Birth, Resurrection, and Ascension of Our Lord." The works in the nave include the removal of the old dilapidated roof, with its flat plastered ceiling, and substituting an open timbered roof stained and varnished, and covered with plain tiles, stone coping, and cross. The east end has for several generations been closed in by timbers and weather boarding, coated with tar, and containing a mean window. All this has of course been cleared away, the walls have been extended 2ft., and a moulded stone arch divides nave from chancel. The fittings have been re-arranged, and a south window opened, the porch rebuilt, and stained glass, depicting "The Presentation of Christ in the Temple," placed in the west window. Mr. Henry Stone, of John-street, Bedford-row, was the architect, and Mr. Joseph Grimes, of Colchester, the builder; the cost has been about £600.

Hugglescote.—On Monday week last the completed portion of the new Church of St. John the Baptist, at Hugglescote, was consecrated. The part of the church already built will accommodate a congregation of about 450, the greater portion being in the nave, which, for the general size of the church, is very large, having an internal length of 78ft., and a width of 31ft. The aisles on each side are less than 8ft. wide, the baptistry 10ft. square, and the south transept about 14ft. by 10ft. The general style of the building is Gothic, of the Early Decorated period, but with a slight French treatment of details. The walls of the church are built of greenstone from Gordon Hill, with dressings of Doulting and Ancaster stone. Internally, the walle are lined with red brick, relieved by bands and mouldings of Corsham Down stone, and also by moulded bricks and red terra-cotta. The bases and caps to the nave arcade are in Pillough stone, the arches being Corsham Down and Red Mansfield. The main columns are polished Shap granite, the smaller columns Red Mansfield and Green Moor stone. The aisle floors are of tiles. The roofs, of open timber work in red deal and pitch pine, are plastered between the rafters, and covered with Swithland slates, capped by red ridge tiles. The total cost is nearly £5,300. The contractor (after the death of the original contractor, Mr. King Vann), has been Mr. Thomas Stirk, of Leicester. The whole of the work has executed from the designs of the architect, Mr.

J. B. Everard, of Leicester, who has been represented by the clerk of the works, Mr. A. Taylor.

Hanley.—The new mission-hall in Union-street, in connection with the Tabernacle Congregational Church (Rev. T. H. Higgs, M.A., Pastor), was opened on the 3rd inst. The building stands in a densely-populated cottage quarter, and to be somewhat akin to its surroundings, the style adopted by the architect is a plain Jacobean, relying for some picturesqueness on a varied outline. The present accommodation is for about 300 hearers, but provision has been made by which the north wall may in the future be converted into a nave arcade (by simply removing the windows and walling between the piers) and a north aisle erected with nearly a hundred additional sittings, and with a second vestry or class-room beyond. The building is faced outside with the best local red pressed bricks and covered with red tiles, local red stone being used, internally it is lined with white brick, with red brick dado and strings. Mr. Sugden, of Leek, is the architect, and the works have been satisfactorily executed by Mr. G. Ellis, builder, of Hanley.

Leamington.—Important improvements have just been carried out at the parish church. A new organ has been supplied, a stone reredos, carved by Bouton, of Cheltenham, and a new stone pulpit have been erected. Brass altar rails and hangings have also been supplied by a lady; while another lady, member of the congregation, has presented an altar cloth. In addition to this carved oak steps have been supplied to the lectern, and a new stained glass window given. A new vestry and organ chamber have also been built by Mr. J. Fell, from designs by Mr. J. Cundall.

Metropolitan Board of Works.—At the meeting of this board held on Friday, a deputation, headed by Sir T. Chambers, M.P., attended to present a memorial, asking the board to secure certain building land, adjoining Sutherland-gardens, and between Harrow and Edgware roads, as a public park for Paddington. The matter was referred to the works committee. It was resolved that the remaining unoccupied land on the Albert Embankment be appropriated as an "open space." The board decided not to apply to Parliament next session for the construction of a bridge across the Thames below London Bridge, nor for an amendment of the 60th section of the Building Act as to dangerous structures. Messrs. Kellett and Bentley's tender was accepted for the extension of a sewer in Wood-lane. A letter was received from the Wandsworth district board, stating that a builder in the Wandsworth district, on being required to set back the line of frontage of some proposed houses in an old street 20ft. from the centre of such street, objected to do so on the ground that the 6th section of the Metropolis and Building Acts Amendment Act, 1878, does not apply to "streets existing, formed or laid out for building at the time of the passing of the Act," and another from Mr. T. E. Knightley, district surveyor for Hammersmith, stating that a builder had refused him admission into a house required in the exercise of his duty; both were referred to the Building Act Committee.

Reading.—On Monday there was a grand masonic celebration at Reading, Berks, on the memorial-stone of the new town-hall, free library, reading-rooms, museum, and schools for science and art being laid by the Earl of Carnarvon. The buildings, which promise to be a conspicuous ornament to the town and a fitting complement to its educational institutions, may be said to have originated in 1877. Plans were advertised for, and, after an abortive competition, that of Mr. Lainson, of Brighton, was accepted. The estimated expense of carrying it out was £38,640. The lowest tender, however, for the works amounted to £59,987, while the subscriptions promised were less than £22,000. The building committee considered, in consultation with the architect and the surveyors, what modifications could be made so as to reduce the cost and yet provide adequate accommodation for the various objects proposed. Mr. Lainson's plans being thus modified, and the Council having, with the approval of a large majority of the burgesses, contributed £10,000 out of the borough funds, contracts were entered into for the erection of the buildings.

Shaugh Prior, Devon.—On Thursday, the 30th, the memorial stone of a new vicarage house was laid by Sir Massey Lopes, Bart. M.P., who has also given the site. In the building, standing as it will on the edge of Dartmoor, and exposed to all the storms of that neighbourhood, great care has been taken to render the house dry and warm, and the walls are built in two thicknesses, the outside being of local stone, and the inside of brick, with the 3in. space between filled in with Portland cement concrete, and the two walls bonded with iron ties. The windows, string-course, &c., are of Ham Hill stone, granite being used in bands, and for relieving arches. The style of the house is Elizabethan. The works are being carried out by Mr. Thos. Hosking, contractor, of King Tamerton, from the designs and under the superintendence of the architect, Mr. R. Medley Fulford, A.R.I.B.A., of Exeter.

Society for Promoting Christian Knowledge.—The new buildings of this society on Northumberland-avenue were on Monday formally opened by the Archbishop of Canterbury. The new house, which we recently described at length, is on the west side of the avenue, and at the corner of a short curved street giving access to the avenue from Scotland-yard. The site was purchased for £40,500. The Board of Works made it a condition of the sale of the site that the building to be erected should have a handsome Classical front of stone, marble, or granite; and the architect succeeded in designing a building which satisfied the requirements of the Board, and which, including some expensive but necessary works of superstructure, cost less than £42,000. The total cost of site and buildings, including architect's commission, has fallen by some £11,000 below the limit fixed at a general meeting of the society. The work has been done from the designs and under the direction of Mr. John Gibson, of Westminster, by Messrs. W. Cubitt and Co.

St. Bartholomew's Hospital.—An important addition to St. Bartholomew's Hospital was opened on Monday. The buildings already finished have been about two years in erection, and stand upon the site of some houses which fronted Smithfield. The new stone front is visible from Smithfield, but the approach is through the old gate from the quadrangle built by Gibbs in 1730. The façade is nearly 100ft. in length, and is 75ft. in height from the pavement to the top of the balustrade. There is a bold rusticated granite plinth about 8ft. 6in. high, and above that the whole of the front is composed of Portland stone and terminated with a balustrade. It is in the Italian style and in harmony with the wing buildings of the hospital. The façade next the quadrangle of the hospital is of simple architectural character, of brick and and Portland stone dressings. Within the building the basement contains lavatories, a students' meeting room, and class-rooms. The walls are partly of glazed bricks, for the sake of light. In the upper parts of the building the walls are distempered in a light colour, with a chocolate dado. On the ground floor is the library. On the first floor is a large room capable of being divided in two by a sliding door. Above this floor is a lofty, well-lighted museum, somewhat larger than the library below, containing two galleries. There is a lantern roof of glass and iron. The buildings have been designed by the architect to the hospital, Mr. Edward I'Anson. The builder was Mr. Brass, and the clerk of the works Mr. Streeter.

Thornhill.—On Saturday last the Parish Church of Thornhill was opened for divine service, after restoration by Mr. George Edmund Street, R.A., the eminent architect, the work having occupied about four years. It is about four years since Mr. Street's plan of restoration was accepted and the work commenced. The whole contract was left to Mr. George Mallinson, of Saville Town, and the nave and clergy-vestry commenced by him and much work done, but at his death the Restoration Committee took the matter in hand, and the edifice has been completed under their superintendence. The chancel and the seating for the nave were re-let to Messrs. Joseph Firth and Sons, of Dewsbury. In re-building the nave the Decorated style has been adopted, but the clergy-vestry is in conformity with the architecture of the chancel, which has not been taken down, but has had all its decayed portions removed, and been thoroughly restored. The south aisle is 6ft. wider than the old one, and both aisles have a uniform width each, of rather more than 5½yds. The nave has a gradual slope towards the chancel of one foot, and from the other end there is an ascent to the west doorway through the base of the tower, gained by eight steps. This is a very remarkable feature in the edifice—the steps from the west door to the nave—but it evidently existed in the original building, and has been necessitated by the rapid slope of the ground to the east. At the foot of these steps is the font. Viewed from any part of the church its interior is indeed grand, but it is best seen from the steps we have mentioned; both nave and chancel, the latter seen through a wide, lofty, and well-proportioned arch, show to great advantage. The total length of the edifice internally is 110ft. 6in., and the width across the nave and aisles 59ft. 3in., the height being 38ft. The chancel, including the aisles, is 53ft. wide, and from the roof to the floor the depth is 33ft. 6in. Externally the appearance of the body of the building is very fine, but the tower is unaltered. The south porch is of stone groined. The stone used in rebuilding and restoring the church is, inside and outside, dressed ashlar. The windows, doors, plinths, string courses, arcade arches, and buttress weatherings are of Huddersfield stone, from Netherton quarries. All the stone carving in and outside the church has been executed by Mr. Thomas Earp, of London. The woodwork has been executed by Messrs Joseph Firth, of Dewsbury. The floors in the passages to the seats are laid with Maw and Co.'s tiles. The cost of the restoration amounts to upwards of £12,000.

West Kensington.—A new Wesleyan Methodist chapel was opened on the 30th October at the junction of the Netherwood and Brook Green-roads, West Kensington Park. The structure is Early English in style, the material being Kentish Rag Stone, with Bath stone dressings. At the north-west corner is a gable and crocketted spire, surmounted by an iron cross, which does much to emphasize the most important angle of the chapel. The interior of the chapel consists of nave and aisles. Constructed with iron columns and finished with arcades above the galleries. In the basement is a lofty schoolroom flanked with large class-rooms capable of accommodating upwards of 400 children. The chapel and galleries will seat 1,000 persons. Mr, Charles Bell, of Union-court, Old Broad-street, is the architect, and Messrs. Lucas and Son, of Kensington-square, were the contractors. The immediate supervision of the building was in the sole charge of the contractors' foreman, Mr. Doody. The contract price was £6,860.

Wribbenhall.—The new church of All Saints, at Wribbenhall, near Bewdley, was consecrated last week. The total cost is £6,000, nearly all of which is now raised. The church is of the Geometrical Decorated style, and the whole of the exterior is of red Alveley stone, with a complement of ruddy Broseley tiles for the roof. The church consists of a nave, south aisle, and chancel, with a south transept, and there is a small tower and bell turret on the north side. It is built to admit of future enlargement, when necessary, and at present will seat about 450 persons. The church has been built by Messrs. Horsman, Wolverhampton, from the designs of Mr. Blomfield, of London.

CHIPS.

The vestry of St. Marylebone have referred to a committee the consideration of the question whether it is not advisable that the works of breeze collection, slopping, and watering should be carried out by the vestry instead of by contract. A step in the right direction.

Mr. Samuel Knight Pollard, architect and builder, of Taunton, died on Thursday in last week at the age of 71. For more than half a century Mr. Pollard has been a prominent public man in Taunton; he was a member of the late board of health and of the market trust, and in other capacities took a leading part in measures for the benefit of the town.

At the Petty Sessions for the East and West Flegg Divisions, on Tuesday, Mr. Brereton, C.E., the county road surveyor for Norfolk, lodged an indictment against the surveyors of the parishes of Rollesby, Great Ormesby, and Little Ormesby, for gross and continued neglect of their highway duties. The roads demonstrating the alleged neglect are the Burgh and Martham, and the Rollesby and Yarmouth.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J, PASSMORE EDWARDS.

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The charge for advertisements is 6d. per line of eight words (the first line counting as two). No advertisement inserted for less than half-a-crown. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

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Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

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"BUILDING NEWS" DESIGNING CLUB.

PEDRO. (The 18ft. and 22ft. is intended to be for the area of ground; the entrance may be taken out of either frontage. (3.) A marginal line is optional. (4.) Write again.)—WALTER H. BRIERLEY AND QUIZ. (The second list of subjects appeared a week too soon, so 28 days from the present date will be given. Lights may be introduced on the rear side for back offices. All drawings on rollers will be returned on rollers.

DRAWINGS RECEIVED.—F. in circle, Ormond, Rusticus, B. in 3 circles, Honey Dew, James in circle, A. U. C. in triangle, Yes or No, J. H. S., Quiz, Greyhound, Binny, Mente Manuque, Edwin, Anteverta, Intersecting circles, Ora et Labora, Franc-tireur, B. in circle, Rosebud, Heart and Arrow, Tee-square, P. in quatrefoil, Attempt, Peter, Timeo, Clansman, Fidessa, Pupil, J. Lancaster, Our Praises are our Wages, Nineteenth Century, Resurgam, Ad Aliquid, Ogmore, Medi-o-cria Firma, Beltshazzar, A. in circle, Vanity Fair, Burswell, No. 90, Sub Judice, Fleur-de-lis, Try Again, T.

Correspondence.

COMPETITIONS AND THE INSTITUTE.

To the Editor of the BUILDING NEWS.

SIR,—The inclosed circular has been sent to all the "Fellows" (and in a day or two will be sent to all the "Associates") of the Institute of British Architects.

If you think it a step in the right direction, will you kindly insert a copy of it in your next issue of the BUILDING NEWS, and give the thousand members of the Institute the benefit of your valuable suggestions on the subject of the Competition system?

I think you will most probably sympathise with the view that at any rate it is time the "Fellows" of the Institute refrained from sending in designs in open competition, though you may not perhaps think the time has yet come when open competitions should be discouraged by the whole of the members of the profession.

I should heartily rejoice myself to see the open competition system entirely abandoned, but I hardly hope for such good things to be attained for some years.—I am, &c.,

THOMAS PORTER.

"COMPETITIONS" AND THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

DEAR SIR,—As the season is approaching when our Institute will again meet for its Sessional deliberations, I intend at an opportune moment (if I can rely upon the support of the "Fellows" generally) to call the attention of the Council to the subject of "Competitions," with a view to some practical steps being taken to minimise the evils arising from the Competition system as at present practised.

Believing that the Institute is the only body that can with any hope of success deal with this subject, I venture to hope that the time may have arrived when the "Fellows" (about 350 in number), as the elders of the Institute, will by some dignified act take the initiative, and determine from some given date to refrain from engaging in any open Competition (or in any limited Competition where a substantial honorarium is not offered to each competitor), and will make it incumbent on every "Fellow" hereafter elected to sign a declaration that he will not engage in any open competition.

It is not too much to hope that such a course of action would ultimately lead to the discontinuance altogether of the "Competition system," as Committees would hesitate before advertising for designs, if they felt sure that not a single "Fellow" of the Institute would respond to such an appeal, and it is not unlikely that a large proportion of the Associates and the Members of other Architectural Societies would cheerfully follow the example set by the "Fellows."

One of the arguments (and it is a powerful one) at present used by those who engage in Competitions, to justify their action, is that the "Fellows" of the Institute have not hitherto discouraged the system, but rather on the contrary, some of the most distinguished men are still found ready to engage in any Competition of importance.

Open Competition *must* be a serious loss to the Profession as a body, as it may be taken for granted that few buildings of any importance are now erected without some architect being professionally employed, and consequently the whole expense of Competition drawings and the time expended upon them is so much money absolutely thrown away, less the premiums (which are generally small) that may be paid to the successful Competitors, and while it is difficult to estimate with any degree of accuracy the cost of Competition drawings, it can he no exaggeration to say that very serious sums must have been lost in the several large Competitions that have recently engaged the attention of the Profession.

Small competitions are even more prejudicial to the well-being of the Profession, because the number of Competitors is often very numerous and the premiums small, and not unfrequently the payment of the premiums is the end of the matter. I may, as an instance of this, mention the Addiscombe-road Church Competition, when 75 Competitors responded to the invitation, and the work was never carried out, the premium of 50 guineas being the only remuneration paid.

Assuming the modest sum of £10 as the average cost of each set of designs (and it would probably be three times that amount in many cases), the loss to the profession on this Competition alone amounted to £700, and such instances are not uncommon, especially in Church Competitions. It is clear, therefore, that the amount annually lost by the Profession through the Competition system must be very large.

The total abolition of Competitions would I believe do at least three things for the profession:

1st. Increase its dignity.

2nd. Materially improve the financial resources of its members.

3rd. Materially benefit the position and increase the remuneration paid to the architectural assistants in our offices.

I may at some future time place before you some important statistics relating to Competitions; and in the mean time I shall be greatly obliged if you will favour me with any suggestions that may occur to you on the subject to which I have directed your notice, and especially inform me whether, in Competitions where you have been successful in gaining the first premium, the works have been carried into execution with results wholly satisfactory to you, or whether the reverse has been the case.

I should also be glad to know that you sympathise with and would support the movement of the "Fellows" in the action I have indicated, that I may regulate my further action accordingly.—I remain, dear Sir, yours faithfully,

THOMAS PORTER,
Fellow of the Royal Institute of British Architects, and Vice-President of the Society of Engineers.

2, Westminster Chambers, Victoria-street, S.W.,
1st November, 1879.

P.S.—It may be worthy of consideration whether the Institute might not with propriety recognise a Commission of 6 per cent. instead of 5 per cent. as a proper professional charge for "Fellows" to make in future on works carried out by them.

THE INSTITUTE PREMISES.

SIR,—If in the remarks in last week's journal relative to the above, the innuendo as to supposed lack of ability referred to the architect employed, it appears to me most unjust, and I must strongly insist on the need of the gentleman to whom the work has been intrusted being allowed untrammelled to complete the same. He should have *entire* control over the decorations and furnishing. No architect likes to be interfered with in carrying out his design, and it would be very inconsistent for the members of the Institute to treat a fellow-practitioner otherwise than they would wish to be treated themselves. His single mind may, I believe, produce a satisfactory result, whereas interference would result in a hodge-podge, thoroughly bad. I hope what is done will be simple and unpretending. There is a deal of false taste passing current now in the rage for novelty; no longer able to attain the beautiful, pretenders deify Ugliness, and from such defend us!—I am, &c.,

M.

ARCHITECTS AND THEIR CLIENTS.

SIR,—In your Intercommunication Column this week, there are several queries for advice under the circumstance of difficulty having arisen with the client, owing to the estimates coming to more than he had anticipated, and very frequently cases of a similar nature appear in your columns. They are also only too frequent in everybody's experience. Now, most architects will agree that clients are often very extravagant in their expectations, and I am quite ready to suppose that those of your correspondents have been especially unreasonable and exacting.

There still remains, however, the unpleasant fact, that with regard to incidents of this sort a good deal of unpopularity attaches to the profession, which it is worth our while to do all we can to mitigate, if we cannot entirely avoid. I am inclined to think, from all I can see and hear that there is sometimes a want of caution on the part of many architects in the earlier stages of their engagement, upon this head. A client, too, generally comes to them with the expectation of getting fifteen hundred pounds worth of work done for about a thousand. Perhaps he has seen some house done for a friend by a third-rate builder, or which has been run up on some speculative estate, and he thinks with the help of an architect he can get a better article for nearly the same money, which of course to some extent we hope he can, for the architect will, at any rate, see that he is not grossly cheated; but the client generally expects something a little more than this, that he shall have all the good taste and sound building the architect can insure him, and have the benefit of the speculative builder's low prices into the bargain.

Now, the majority of architects are at any rate gentlemen, and I do not for a moment suppose questions of percentage have any conscious effect upon their actions; but, nevertheless, they shrink sometimes, perhaps, from insisting too strongly at first on their client's mistake, for fear of driving him away, or they are influenced by hope that his mind will expand after a few interviews, or they are of a sanguine turn, and trust that by showing a good design at first, he may be tempted on, and if not, there will be time then to cut it down.

The cubing, again, which probably takes place at this stage, is rarely allowed to interfere with the design; and in how many cases does it not happen that we, perhaps unconsciously, make the total we desire the factor of the price per foot, rather than the price per foot the factor of the total sum!

Now I admit that if we rigidly kept our design within the limit of the amount first named in our commission, the result would often be satisfactory neither to the architect or the client, but short of this, is there not often room for a little more explicitness between them on this head? Let the client be thoroughly well warned beforehand, and though disputes and recriminations cannot perhaps in every case be avoided, they will, I doubt not, become much less frequent.

Some clients, there is no doubt, the greatest prudence will not keep one safe with. I know of a case of a wealthy insurance company who, after getting plans made, receiving estimates, and finally building the house, now turn round and repudiate the architect's fees on the ground that the building cost twice as much as the amount named in their instructions. How the worthy secretary and directors who signed the contract justify themselves, I leave to their corporate conscience.—I am, &c.,

F. W. Lockwood.

5, Corn-market, Belfast.

RESTORATION AT ST. ALBAN'S.

Sir,—There is an old saying that one should believe nothing he hears, and not one-half of what he sees. Mr. White, F.S.A., has made the discovery that a *Norman cornice* has been destroyed on the south side of the nave of the abbey. This assertion is a sample of much that has been written during the past twelve months of our doings and misdoings.

The "Norman cornice" was built on a wall raised 5ft. 6in. in the thirteenth century, which was afterwards added to, and in itself was composed of some pieces of Roman tile, inserted for repairs, a course of bricks 9in. by 4¼in. by 2¼in., manufactured within the last fifty years, and the remainder common roofing tiles, and plastered.

This discovery may be ranked with the celebrated one of "Bill Stumps, his mark."—I am, &c.,

John Chapple.

St. Alban's, November 5th.

CHIPS.

Bethel Chapel, Bradford, Yorkshire, having been closed for alteration and renovation, was reopened on Sunday. A new central entrance has been made, from plans prepared by Mr. J. Jackson, architect, Otley-road, and the stonework prepared by Messrs. Tidswell, of Manningham, Messrs. Arundel and Roome carrying out the decorations.

The following are the subjects of papers to be read during the remainder of the present session of the Glasgow Architectural Association:—November meeting, "Brick Building"; December, "Stone as a Building Material"; January, "Iron Construction"; February, "Heating and Ventilation"; and in March the election of office-bearers for session 1880-1 will take place.

The South Molton Burial Board last week instructed Mr. Cock to prepare plans and specifications for a lodge and other buildings to be erected in the new cemetery.

A new Board School in Whitfield-street, Tottenham Court-road, was opened on Saturday week. The contract for erection was taken by Messrs. Wall, Brothers, of Dale-road, Kentish-town, and the schools, which accommodate 600 children in three departments, have been erected from the designs of Mr. Robson, architect to the London School Board. The site is so restricted that the boys' playground is situated on the roof of the building, that for girls and infants is obtained by building on arches.

A meeting was held in the Council Chambers, Edinburgh, on Wednesday, for the purpose of taking steps to carry out the Act authorising the complete restoration of St. Giles's Cathedral. Resolutions were adopted thanking Dr. Chambers for his munificent offer to complete the restoration of the cathedral, and appointing a committee, with powers to procure subscriptions, and to purchase vested interests acquired by West St. Giles's congregation. About £500 was subscribed at the close of the meeting.

A new Established Church at Law, N.B., is nearly completed, from designs by Messrs. Stewart and Menzies, architects, Edinburgh, in the Early Gothic style, and seated for 500 persons.

An international exhibition is to be held at Madrid in May, 1881. M. Colibert, a French architect, has been requested by the Spanish Government to furnish a design for the building to be erected.

New Wesleyan schools, erected at a cost of £1,300, were opened at Kearsley, near Bolton, on Saturday week. The large room seats 400 scholars, and there are also six class-rooms.

The Forncett and Wymondham Junction Railway has been begun. It is to be a double line 6¼ miles in length, connecting the railways of the Great Eastern Railway Co. between London and Norwich, *viâ* Cambridge and *viâ* Ipswich, at a point nine miles from Norwich. The contract has been taken by Mr. Henry Lovatt, who has 350 men at work. Mr. Liddle, C.E., has supervision of the work under Mr. Wallick, resident civil engineer of the G. E. R. The heaviest part of the works are at Wrenningham and Hapton, where there are deep cuttings.

Intercommunication.

QUESTIONS.

[5938.]—**Ventilation of Shop Windows.**—Can any of your numerous readers suggest a remedy for the steaming of shop windows? Considerable difficulty is found both on the inclosed and the uninclosed windows, and the cutting of large size ventilator holes above the windows has no perceptible effect.—C. H. C.

[5939.]—**Ash-Trees as Boundaries.**—In the West of England, and notably in Somersetshire, the ash tree is very frequently used as a boundary or landmark. Is there any superstitious cause for this choice?—Dryasdust.

[5940.]—**Size of Drain.**—Will some experienced reader inform me what the size of a stoneware pipe drain should be to take the drainage of three w.c.'s, 1 lavatory, 1 housemaid's sink; and 1 kitchen sink, all in one house? Will a 4in. pipe be large enough, all surface water excluded? Also for a group of 4 cottages, each containing 1 w.c. and 1 sink, surface water excluded. Will a 4in. pipe be large enough in this case also? How many similar cottages to the last will a 6in. pipe drain? Upon what basis should the calculations for the above be made, on the average daily volume or the greatest possible volume during any period of the day, and if the latter, how can it be arrived at? In Bailey Denton's "Sanitary Engineering" it is recommended that "tarred gaskin and cement" should be used for jointing stoneware drain-pipes. What is "tarred gaskin"?—Student.

[5941.]—**Settlement in Schoolhouse Wall.**—I am anxious to have immediate instruction on the following subject:—A slight settlement made itself apparent four months ago at gable corner of a schoolhouse built some eight years, about some 6ft. away from quoin in side wall. The building is rectangular in plan, with gable at either end, height from ground to apex about 30ft., and from ground to eave of side walls about 13ft. The thread, though slight at first, has so increased that it is now more than an inch wide, and still continues to get worse. The foundation of gable end wall appears to be sinking away from rest of building, and is wrenching away the sill of a three-light side window. Would a heavy buttress worked well into quoin be effectual in arresting progress of settlement, as something must be done at once? I would like the opinion of Henry Ambrose and some other competent advisers.—T. P. F.

REPLIES.

[5903 and 5926.]—**Measuring Slating and Plastering.**—I think that the "Intercommunication" columns of this journal are taken advantage of in a manner surely not originally intended by people who ask questions similar to the above. It was not intended to save the party a guinea for obtaining a surveyor to measure the work correctly, and it is unlikely that anyone would volunteer information of any value in that manner, any more than they would take a pupil and teach him their business for nothing. Would a dyer go and tell you how he obtains his colours when he has spent many years in finding it out for himself? No; if you want that colour you must send your goods to be dyed by him, and in like manner if you want trustworthy information on points of this sort, for goodness' sake pay a guinea and obtain a surveyor to measure it. There can be no one who does not know the address of several by reading the advertisements in this journal.—X. L.

[5914.]—**License for Valuing Dilapidations.**—I beg to differ from J. Shilcoach in his definition of a valuer. Although every appraiser would call himself a valuer, it is not the fact that every valuer need be a licensed appraiser. To value dilapidations or any artificer's work does not require a licence. I have made scores of valuations without, in the capacity of architect and surveyor, although in cases of award a stamp is legally necessary.—G. H. G.

[5916.]—**Levels of Sewer Inverts.**—As I was asked my opinion on this question I may say that the plan I have adopted is to use sight-rails, taking the readings or depths of invert above the datum plus the height of boning-rod to surface of ground. By this means the sight-rail can be read at any point along the line of sewer and the depth of invert obtained therefrom. Instead of using a rod and sight-rail, the invert may be taken at a given point—say it is 15' 3, then supposing a fall of 9in. in 500ft. lower down, the reading on proposed invert would be 16ft. Pegs may then be driven and the levels marked, allowing, of course, for height of peg.—G. H. G.

[5918.]—**Valuations.**—I can refer "Valuation" to Ryde's "Text Book." Wheeler's "Valuer's Handbook," both published by Crosby Lockwood. 2. It gives a valuator a better position to take out a license.—G.

[5920.]—**Road Surveyors.**—A recent work on the subject on which "Road Surveyor" inquires, "The Maintenance of Macadamised Roads," by Thomas Codrington, may be read with advantage. It is published by Messrs. Spon, of Charing-cross.—G. H. G.

[5922.]—**A Family Profession.**—Mr. Wm. G.'s communication is interesting. He notices that in Elmes' "Wren and his Times" the date of Strong's death is fixed at 1681, some 29 years before the cathedral was finished. A couple of days after the recent opening of St. Paul's churchyard a leader occurred in the *Daily Telegraph* upon this cathedral, and the following information was given therein:—"The first stone of St. Paul's was laid the 21st of June, 1675, by Sir Christopher Wren, assisted by his trusty mason, Strong, but without any public ceremony. In 1710, Sir Christopher, then nearly 80 years of age, laid the last stone, accompanied by his son, and still attended by his faithful Strong." Thus Elmes and the *Daily Telegraph* do not seem to agree. The present representative of the family, Mr. William F. Strong, clerk of the works at Mr. Maurice H. Pocock's new church, now erecting at Upper Tooting, S.W., has many a time told me that, according to family record, his ancestor was the master mason right through the St. Paul's Cathedral job, and the leader in the *Telegraph* seems to confirm that tradition. At the same time, as the *Telegraph* makes mistakes sometimes, and may have blundered in this, it would be satisfactory to know its authority. The main point, however, lies not so much in the length of time old Strong had the Cathedral in hand, but in the fact that his descendants have ever since—*i.e.*, for more than 200 years—had a representative in the building trade.—Harry Hems.

[5922.]—**A Family Profession.**—In answer to "W. G.'s" question, Mr. Hems is right, Elmes is wrong. The words in the "Parentalia" are very explicit: "The highest or last stone on the top of the lantern was laid by the hands of the surveyor's son, Christopher Wren, deputed by his father, in the presence of that excellent artificer, Mr. Strong, his son, and the other free and accepted masons chiefly employed in the execution of the work." That was in 1710. The son seems to have been employed soon afterwards at Kensington. I have a long letter of his, dated 1721, addressed to Mr. Henry Joynes, referring to carriage of materials "for above these 14 years."—John J. Cole.

[5923.]—**Shadows.**—W. Griffiths need not be particular about so small a matter as representing a north façade in full sunlight, nor of representing his shadows as coming always in same direction, whether north, south, east, or west. The judges at South Kensington are not likely to be too critical on that point, to judge from the prize designs so often published. W. G. will find scores of north fronts in the illustrations in architectural periodicals almost invariably in full sunlight. Also by parity of custom he will invariably find in "interiors" of churches that the light comes from the north. I have more than once drawn attention to these phenomena in the columns of the Building News without any notice being taken. After all, imagination goes a long way, and it is as great a pity to spoil a pretty drawing by nice questions of accuracy as to mar a good story with malapropos remarks as to fact.—B.

[5924.]—**Painting on China.**—The technical difficulties are not great to an artist in oil or water. Underglazed painting, though more difficult to work and get glazed, is far superior to the over-glazed for decorative effects. Unless the paintings possess some very special merit, their only use is to victimise one's friends, as they have no saleable value. The best book on the subject is "The Amateur Pottery and Glass Painter," by C. E. Hancock, published by Chapman and Hall, which contains every information on the subject.—Alfred Masson.

[5924.]—**Painting on China.**—"F. S." must be a very recent or careless reader, or he would have noticed your review on p. 474 of a work as likely to suit him as any. Amateur work commands little remuneration, and a real artist may easily find more profitable and artistic employment. China, in my opinion, is not a legitimate medium for painting in the proper sense of the word.—G. F. T.

[5925.]—**Roof Flashing.**—Do not insert flashing in walls, but turn up lead gutter and slip with slate in cement in lieu of flashing.—Geo. Smith.

[5925.]—**Roof Flashing.**—If it is a party wall of course you can put your flashings in the wall of your neighbour's house.—G. H. G.

[5927.]—**Architects' Responsibility for Smoky Chimney.**—An architect is no doubt morally and legally responsible for any defective construction in the building of a house, but as smoky chimneys often occur from circumstances over which he cannot always exercise control, I do not think "A. R. I. B. A." can be held amenable in the case mentioned if the chimney has been built in a proper manner and the flue properly turned. Possibly the throating over the fireplace is too large.—G. H. G.

[5928.]—**Land.**—Of course, sloping or hilly ground should be reduced to horizontal measurement as the area on the slope would give a larger quantity than could be practically turned to account. The horizontal distances may be obtained by holding the chain level and placing the arrow vertically under it. This, however, cannot be done accurately on very hilly ground, when the distances must be measured along the slopes and the angles of elevation and depression taken by a quadrant or other instrument for measuring angles. Tables are published showing the number of links to be deducted from every chain length for the angles recorded. A simple instrument with an arc divided into degrees and a small plumb-bob is sometimes used.—G. H. G.

[5928.]—**Land.**—All land is measured horizontally. The sloping measurement would not give proper size of land.—Geo. Smith.

[5928.]—**Land.**—It is the custom generally to measure land horizontally, because plans being wanted, it would be impossible to make a correct general plan, if measured on uneven surface or sloping. It might be done for one piece. Besides, unless the land is very steep it is not worth the extra trouble to prepare separate surveys of every acre. I have surveyed coal-pits, the measures of which are so steep a deduction of from 9 to 15 links per chain is necessary for the plan, a correct one of which could not otherwise be made.—Henry Vickers.

[5929.]—**Ventilation.**—A fire promotes currents by the radiation of its heat, causing inequalities of density, also producing a vacuum in the room, to replace which the cold air rushes through all possible crevices and chinks, causing innumerable draughts. There are several methods of ventilation, though the majority are very imperfect. For inlets, air bricks are inserted about the level of the skirting boards, but they create draughts. To obviate this evil vertical tubes have lately been used, which allow the inlet air to enter the room about two-thirds the height. The cold air, however, falls like a cold shower-bath on the heads of the occupants, besides being rendered partially impure owing to its meeting the impure exhaled air. A system lately adopted aims at preventing the draughts by allowing air to enter by very small conical orifices. Their size, however, render them very liable to be choked with dust. This system now appears before the public as a novelty, but the Moors adopted similar orifices for ventilating their baths at Grenada. The system proposed by Mr. B. H. Thwaite in his "Hygiene applied to Dwellings," is, in my opinion, the ne plus ultra for ventilating small habitations (see

Figs. 1 and 2). The inlet air enters at the grated openings, A, and passes along cavities in walls to chimney, where it encircles the chimney flue, and special battlers, which prevent the air from escaping too quickly; the air thus abstracts the heat and enters the room at a warm temperature by the inlet B, which is covered with wire gauze. The impure exhaled air passes from the room by the outlets C, into the staircase E, which is the grand channel of dilution and escape. The heat atoms generated are thoroughly utilised in warming the staircases, landings, and chambers before passing through the outlet louvre F (which may be rendered an element of external beauty). The bed chambers, therefore, become agreeably warm by the constant passage of heat atoms through them, and additional ventilation similar to day rooms may be adopted for school-rooms. The inlet air should be allowed to enter chests containing hot water coils before being allowed to enter the room.—J. L. Brookes.

FIG. 1

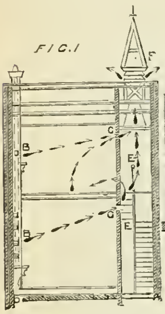
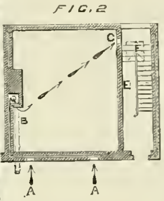
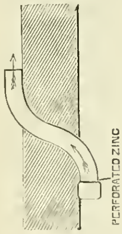


FIG. 2



[5929.]—**Ventilation.**—I have used a great many of Boyle's talc ventilators for the outlet of foul air, and have always found them answer admirably. They should be placed near the ceiling, if possible in the smoke flue, because when there is a fire the foul air is drawn off more rapidly. These ventilators do not get out of order, nor do they require any attention. The talc flaps make a slight noise, which is objectionable in bedrooms. Care should be taken in fixing that no putty gets under the flaps. The plan I have adopted for the admission of fresh air is to build a 4in. iron "swan-neck" rain-water pipe in the wall (see sketch). They can be got to suit any wall of ordinary thickness. A piece of perforated zinc can be fitted into the socket end of pipe. This is the end which should be on the outside of wall. The other end of the pipe in the room should be about 4ft. from floor. In the ordinary way of having a grating outside which is connected with a pipe inside, it is found, when the grating is near the ground that the blacks drive in. With a pipe fixed in the way I have described this is obviated, and all the advantages of an upward current of air obtained. It has the further advantage of hardly being noticeable in the room.—C. F. M.



[5929.]—**Ventilation.**—In reply to "Phiz," who wishes a reply from me, I beg to say (1) that the simplest and therefore the best way of ventilating dwelling rooms of small size is to introduce an Arnott's valve (a noiseless one) into the smoke flue. If the windows and doors are properly placed, with perforations or inlets over the door head with a deflecting plate to direct the current of fresh air upwards, all that is necessary for the supply of fresh air is insured. In most houses, however, there is always a sufficient quantity of cold air entering the room, and therefore the principal object is to prevent draught by providing a proper outlet. The use of a ventilating fire-grate with warm air chambers is the best corrective for a draughty room. (2) In rooms of large size such a method becomes ineffective by reason of the inadequacy of one outlet to perform the function of letting out the vitiated air. A number of outlets and also a distribution of inlets becomes desirable, so that the air should be changed without draught and that the whole room should benefit by a constant change of the air. Several excellent plans have been introduced lately to effect a general displacement of the air of large rooms. Myself, believing in the value of simplicity as a starting principle, I should introduce warmed air either in the skirting or, better still, at the height of 5 or 6ft. through perforations like those of Ellison's conical openings; I should perforate the ceiling or cornice and provide communication between these and the flue of a chimney or *vertical* tube with a deflecting ventilator thereon, so that a constant change of air may be effected. I have great faith in the deflecting ventilator, or that which creates an up-current, by creating a partial vacuum at the top, and believe that by proper openings below any rooms may be efficiently ventilated by it. For school rooms, lecture halls, &c., this method admits of a variety of treatments which it would be impossible to mention here, and I have only sketched the principle that has been found most effective. Unfortunately, the "fads" of inventors and patentees have invested the subject of ventilation, like all other valuable agencies for health, with all sorts of complexities and difficulties, whereas the subject is one of the simplest in the whole range of physical science. The answer to the question, "In what way does a fire in a room tend to purify it?" will be found by a reference to any elementary treatise on pneumatics or ventilation, but I may simply inform "Phiz" that the fire creates a draught up the chimney by the rarefaction of the column of air in the flue, and as the air in the flue is constantly ascending as it is heated, so a fresh supply of cold air takes its place, thus creating a current from the door or window to the fire. In back numbers of the Building News several articles on ventilation will be found.—G. H. G.

[5930.]—**Architect and Client.**—B. can legally charge for work done the amount agreed on—viz., 2 per cent. I wonder that any architect should agree to do work for such a sum, and still more that A. should refuse to pay it unless B. were guilty of negligence.—George Smith, Architect.

[5930.]—**Architect and Client.**—As B bargained to carry the work out for 2 per cent. he cannot charge more nor less to A. The customary charge for plans, specifications, and tenders is 2½ to 3 per cent., but B has waived his right to this by the bargain made.—G. H. G.

[5931.]—**Quantities.**—Unless "D. M." can show a written authority from the proprietor to get the quantities prepared I do not think, under the circumstances, that he can legally be made liable for them, as the quantities are merely undertaken to enable the builders to tender, and may be regarded as means to that end. I may observe, however, custom is in favour of the architect's claim.—G. H. G.

[5934.]—**Testing Portland Cement.**—I presume the usual mechanical testing of the tensile strength is required. This can be most accurately done with Michele's patent cement-testing machine, in which a solid brick of neat cement, of known dimensions, is subjected to a gradually increased tensile strain until fracture takes place; the strain exerted in lb. can be read off a graduated arc along which an index moves. The machine is made by Alex. Wilson and Co., Vauxhall Ironworks, London, who would no doubt send you particulars on application. A specimen machine is, or was, exhibited at the South Kensington Museum.—H. F. R., 1, St. Barnabas Villas, South Lambeth, S.W.

[5934.]—**Testing Portland Cement.**—Portland cement is usually tested by tearing asunder by tensile strain a small block of the cement which has been allowed a certain definite time to set and harden. It is customary to make these blocks 1½in. square; 2¼in. sectional area. The blocks are placed in water as soon as made, and allowed to remain in the water seven days. At the expiration of that period they are placed in a testing machine, which, acting on the principle of the "steelyard," breaks the block of cement and registers the strain necessary to do so. Cement of good quality should break with a strain of not less than 600lb. on the 1½in. square, or about 266lb. per sectional inch. This is the quality of cement employed for engineering works of importance; that used for ordinary builder's work is of considerably less strength. The test blocks of cement are formed with small projections at each end, by which they are held in the testing machine. In the absence of a testing machine, a bucket graduated to contain known weights of water may be suspended to the block of cement to be tested, water being gradually poured into the bucket until the block is broken by its weight added to that of the bucket.—E. D. W.

[5934.]—**Testing Portland Cement.**—Portland cement is usually tested by being submitted to tensile strain, what is called a 7-day test being generally adopted. Briquettes are cast in metal moulds with neat cement. When set these are removed from the moulds and immersed in water until the end of seven days from date of moulding, when they are tested in one of the various machines constructed for the purpose. The briquettes are of various forms, but are so shaped that a portion 1½in. × 1½in., equal to 2¼in. in sectional area is operated upon. A common form is a rectangular one, 3in. wide, 7½in. long, and 1½in. thick, with an incision cast in each side so as to give a neck 1½in. square in the centre of the block. The clips of the machine grip the block on the shoulders of this neck and a strain is applied until fracture is produced. A strength frequently specified is one of not less than 800lb. on a sectional area of 2¼in. at 7 days, but the best Portland cements frequently run up to from 1,000 to 1,200lb., under the same conditions. Tests are frequently made at longer periods of time, greater strength being required; and sometimes with cement gauged with different proportions of sand. The test at 7 days enables an opinion to be formed of the quality without undue delay. Portland cement should be very finely ground, not leaving a residue of more than 10 per cent. when passed through a sieve having 50 meshes to the linear inch, and should weigh not less than 112lb. to the imperial bushel.—Charles Spackman.

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A new building at the corner of George and John-streets, Glasgow, was opened on Monday as a technical laboratory added to Anderson's college. The building is of four stories in height, and at the rear is the lecture-room, in which provision is made for speedily darkening the room; the diagramatic and experimental accessories are very complete, and the table is furnished with a motor. The roof is flat, and is intended to be used for operations too odorous for indoor work. The woodwork of the building is fireproofed by Dr. Angus Smith's process.

Mr. Richard Porter, of the Borough Surveyor's Office, Bradford, has been appointed Borough Surveyor of Wakefield.

STAINED GLASS.

Edensor.—The memorial-window and brass figure to be placed at the west end of Edensor Church, to the memory of the late Mr. J. G. Cottingham, for many years steward to the Duke of Devonshire, will shortly leave the works of Messrs. John Hardman and Co., of Birmingham, to whom the work has been intrusted. The window is of three lights, is treated in a rich style of 14th-century architecture, and all the subjects are taken from Our Lord's allusion to the Good Steward. The centre medallion of the middle light contains a seated figure of our Lord as Master of the Universe, with a text surrounding it. Beneath this medallion, our Lord is represented as delivering the staff of office to a steward, and above the medallion is a steward supplying the household with food. The medallion in the sinister light represents the same officer overlooking the labourers employed in the vineyard, while in the dexter light he is seen paying them their wages at the close of the day. In the four spandrels there are illustrations of the steward overlooking the foresters felling trees, the preparation of the ground for seed, building operations, the gathering in the crops, and the distribution to the poor in winter. Between the medallions are the virtues of Prudence, Justice, Fortitude, and Temperance, and the tracery contains the figures of Joseph, Paul, and Daniel, and above is an angel carrying the crown of reward. Before the window will be a moulded memorial brass figure in kneeling position, and at the base will be an inscription.

WATER SUPPLY AND SANITARY MATTERS.

Leeds.—On Monday last the Corporation of Leeds completed a great scheme of water-supply for that borough, which was set on foot 12 or 14 years ago. In 1867 the consumption of water had exceeded five millions of gallons per day, and further sources of supply had then been explored and tested. In that year the corporation sought for Parliamentary powers to construct the Lindley-wood, the Swinsty, and the Fewston reservoirs, on the river Washburn. The Lindley-wood reservoir was commenced in August, 1869, and finished in November, 1875. It will hold about 720 million gallons, and has cost about £199,000. The Swinsty reservoir was commenced in February, 1871, and finished in January, 1877. It will hold about 960 million gallons, and has cost about £165,000. The Fewston reservoir was commenced in July, 1874, and finished on November 3, 1879. It will hold 870 million gallons, and has cost £150,000 or a little more. The Swinsty reservoir, from which the supply of water is gravitated, is about 16 miles from Leeds, as measured along the conduit-pipes, or about 13 miles as the crow flies. Two 20in. pipes convey the water to a storage-reservoir at Eccup, a short distance from Leeds, which reservoir is undergoing enlargement so as to hold 1,400 millions of gallons, which is more than six months' supply at the present rate of consumption.

LEGAL INTELLIGENCE.

A Borough Surveyor charged with Manslaughter.—A special sitting of the Chesterfield borough magistrates was held on Monday, for the purpose of investigating a charge of manslaughter preferred against William Tuley, the borough surveyor, and William Butler Hague, John Adcock, and Charles Bower, contractors. The defendants were charged with the manslaughter of a little girl named Alice Ann Bates, eight years of age, who met with her death on the 30th of September last by falling into an excavation in Hollis-lane, which, it was alleged, had been left in a dangerous state by being insufficiently protected through the negligence of the defendants. During the week in which the accident occurred the coroner held an inquiry extending over two days, and the jury returned a verdict of manslaughter against all the defendants. After hearing the evidence on Monday for the prosecution, their Worships, without calling on the counsel for the defence, decided that no criminal negligence had been proved sufficient to justify them in committing the defendants for trial. It is stated, however, in a local paper, that as the coroner's jury returned a verdict of manslaughter against the defendants, in the ordinary course they will still have to go for trial on the coroner's committal.

Skirlaugh Church.—Botterill and Another v. Whytehead.—This case was tried before Lord Justice Bramwell at the last Leeds Assizes, when the jury found a verdict for the plaintiffs—damages £50. Mr. Digby Seymour, Q.C., with whom was Mr. Cyril Dodd, moved for a new trial on Wednesday in the Exchequer Division on the grounds of misdirection, that the verdict was against the weight of evidence, and that the damages were excessive. The action was one of libel, for statements contained in two letters written and a memorial circulated to some 36 persons, reflecting on the capabilities of the plaintiffs, who are architects at Hull, for restoring the church at Skirlaugh, in Yorkshire. The defendant is a clergyman residing some seven or eight miles off, at Nunkeeling-in-Holderness. The pith of the letters, which were written to the vicar of the parish and the steward of the squire, was,—"I see by the *Hull News* of Saturday that the restoration of Skirlaugh Church has fallen into the hands of an architect who is a Wesleyan, and who can show no experience in church work. Can you not do something to avert the irreparable loss which must be caused if any of the masonry of this ancient gem of art is ignorantly tampered with?" The jury found that the memorial was fairly written, but the two letters not, his Lordship having ruled the communication was privileged.—Mr. Seymour now contended that the language used was not reckless or excessive. The defendant, in the box, swore that he was actuated by no malice towards the plaintiffs or the Wesleyans in general; that several of his parishioners belonged to that sect, as did one of his churchwardens and his father's confidential agent. If Wesley had lived now he would have been his follower.—Mr. Justice Hawkins: Yes, he swears that now, when he is a defendant. Why did not he say something of that in the beginning of his letter? Why should not a Wesleyan know something of Gothic architecture? Did the defendant swear before the jury he believed a Wesleyan could know nothing of this style?—Mr. Seymour: It was admitted that the plaintiffs had shown no special knowledge of this kind of work, although their business was large. The defendant believed that the plaintiffs, from their taste, tone of mind, and sympathies, were not fitted for this sort of work. There was no trace of *odium theologicum* about it.—Baron Huddleston: Had the reverend gentleman put an adjective, which is hardly possible, but which I will call "emphatic," before Wesleyan, would there not have been evidence of malice?—Mr. Seymour was proceeding to quote "Clarke v. Molyneux," when Baron Huddleston said: My summing up was wrongly reported in that case to the Court of Appeal, and I was represented as having ruled that the onus of proving that the language of a privileged communication was exceeded lay on the defendant, and not on the plaintiff—Mr. Justice Hawkins.—I see the Lord Justice says to the jury it occurred to him "that you might as well say an architect was not fit to repair or form an opinion upon a Grecian temple because he did not believe in Jupiter and Juno."—Mr. Seymour: We called Sir H. Dryden, Mr. Gilbert Scott, Mr. Morris, Mr. Hay, Mr. Hopkins, and other architects, who said that this sort of restoration required a "specialist." This the defendant honestly believed. No damage had been proved to the plaintiffs; 40s. would amply have justified the merits of the case.—Baron Huddleston: There are three kinds of damages. First, what are somewhat wrongly called vindictive; next, contemptuous, to mark the jury's sense of the action; and, lastly, the middle kind, which are supposed to carry costs. Before granting you a rule we must consult the Lord Justice.

Speculative Building.—At Cuckfield County-court on October 23rd, Wm. Buckwell, master builder, of Burgess Hill, sued Wm. Eager, labourer, of the same place, for £12 18s. 10d. for items executed on the latter's premises. Defendant employed plaintiff to erect three semi-detached cottages in Mill-lane. After the work had begun, defendant obtained various loans on the job, which was to amount to £400. These loans were granted upon the good faith and testimony of the plaintiff that the work was being done in a workmanlike manner. The specifications that were, however, drawn up, were most absurdly worded—some portion of the manner in which the houses were to be built, and of what material, was mentioned, whilst not one syllable as to other requirements, nor as to the completion was visible, and one of the witnesses said he should like to place it in a frame in his Brighton office as a curiosity. Mr. John P. Choat, surveyor, and Mr. Henry Card were called as witnesses for plaintiff. Mr. A. R. Tarr, of Brighton, said that the work had been fairly done, with the exception of the flooring in some of the rooms, which, instead of being of 2in. deals, was cut out of battens. The defendant made a counter-claim for £89 for non-completion of contract. Judge Martineau said the work appeared to have been scamped, but he did not see how very good work could be done at £130 per house. He gave a verdict for £24 and costs for Eager for the deficient flooring in the counter-claim, and in the original plaint of £3 8s. 10d., including costs, for Buckwell or minor works executed.

The Douglas Improvement Commissioners and Mr. C. O. Ellison.—This action, brought by Mr. C. O. Ellison, of Liverpool, against the Douglas Town Commissioners, to recover compensation for the alleged adoption of his plans, came to a conclusion on Saturday last, having lasted fourteen days. The summing up of the Judge was decidedly adverse to the plaintiff, and tho finding of the jury was as follows:—The first question left to us was, "Was the deposited plan made by the plaintiff himself?" In reply, the jury say that they are of opinion that that plan was not made by plaintiff. The jury are asked "If they are of opinion that plan was made by Mr. Cregeen?" The jury are of opinion that it was made by Mr. Cregeen. The jury are asked, "If the plan was made by Mr. Cregeen, was it made by him as agent for the plaintiff?" They are of opinion that he was not the plaintiff's agent. The jury are also asked, "If the plan was made by Mr. Cregeen, but not as agent for the plaintiff, was it, or the sea line on it, copied from the plaintiff's plan?" The jury are of opinion that the plan made by Mr. Cartwright was not copied from plaintiff's plan; but they are rather of opinion that the sea line was suggested by the plaintiff's plan. The jury are then asked—"Should they be of the opinion that the line was plaintiff's line or copied from plaintiff's line, what sum do the jury consider should be paid to the plaintiff for having defined that line?" The jury are of opinion that the plaintiff is not entitled to claim for the suggestion of the sea line, as he was not the originator of the idea of the promenade. And with respect to costs, the jury are of opinion that as the action was brought against the town commissioners illegally, they ought not to be chargeable with any costs of the suit.—His Honour: Then do you dismiss the action with costs or without costs?—With costs, of course.—His Honour: I think that what the jury have brought in should appear on the record in some way or another.—The Attorney-General: If your honour makes a minute of the reasons, that will answer the purpose.—His Honour: The verdict amounts simply to a dismissal of the action with costs.

CHIPS.

An influential deputation from the Deptford vestry waited upon the directors of the South-Eastern Railway Company, on Thursday in last week, to complain of the dangerous and inconvenient condition of the Deptford station. The platforms are remarkably narrow; about 70ft. of the down platform is only 4ft. 6in. wide, a space still further reduced when the carriage-doors open, and the staircase and passages are quite inadequate for the traffic. Sir E. Watkin, M.P., in reply, said that the company were acquiring property to widen the station. and would endeavour to alleviate the inconvenience. When this has been done the company ought to reconstruct their London-bridge station, which is also disgracefully inadequate to its purpose, and contrasts ill with the rearranged station of the Brighton Company adjoining.

New class-rooms added to the Sunday-school of Dacre-park chapel, Lee. S.E., were opened last week. The builder was Mr. Harvard, and the cost £172.

The new Trinity Wesleyan church, at Silverdale, near Lancaster, was opened on Wednesday week. It is a parallelogram, 61ft. by 24ft., roofed-in by an open-timber roof, divided by principals into seven bays. At the east end is a room 21ft. by 24ft., which will be used as a vestry and as class-room. The pulpit, Communion-table, and reredos are of carved oak, and the seating is pitch-pine benches. The three-light window at the east end is filled with painted glass, the subjects being the Crucifixion of Christ, with figures of Moses and Melchisedec in the side lights. This and all other windows have been supplied by Messrs. Shrigley and Hunt, of Lancaster and London. Mr. W. Wright, of Lancaster, was the architect, and the contractors were: for masonry, Mr. R. Hill, of Allithwaite; carpentering, Mr. R. Wright, of Lancaster; slating and plastering, Mr. Cornthwaite, and plumbing and glazing, Mr. Abbot, also of Lancaster. The cost has been £1,500.

The Woolwich local board of health unanimously agreed last week to raise the salary of Mr. Thomas, the board's surveyor, to £250 per annum.

The parish church of Newton, Cambs, was reopened last week, after restoration at a cost of £300. The west bay of north aisle, which had been bricked up and used as a schoolroom, has been restored to the church, as has the similar bay on south side, which had been used as a storehouse: and the font and organ have been altered.

The church of St. Paul, Llanelly, was reopened on Sunday week, after renovation at a cost of £400.

It is stated that an action will be brought by Mr. Williams, C.E., of Southport and Wigan, against Mr. Wilson, chairman of the Liverpool water committee. Mr. Williams claims to have originated the Vyrnwy water scheme, and asks compensation.

A new spire has just been added to the church of Butterton, near Leek. It is built of stone from the Sheen quarries in the neighbourhood, by Messrs. Bassett and Wilson. The architect was Mr. Sugden, of Leek.

Our Office Table.

The large hall of the Cowper-street schools, Finsbury, was crowded on Saturday evening by an audience largely composed of artisans, who attended to hear an address by Professor W. E. Ayrton upon the "Improvements Science can effect in our Trades, and in the Condition of our Workmen." The address was introductory to a course of twelve lectures to be delivered by Professor Ayrton on some of the practical application of electricity and magnetism, under the auspices of the City and Guilds of London Institute for the Advancement of Technical Education, the first of which course was given on Monday evening, and was illustrated by experiments and the oxy-hydrogen lantern.

We have called attention more than once lately to the new copying processes for reproducing letters, plans, &c., by means of flexible slabs of composition composed of gelatine and glycerine, but the one which gives the best results is certainly the "Multiplex Copying Process," invented by Mr. Charles Fellows, of Wolverhampton. Its principal advantages are the even and clear character of the writing in the copies reproduced, the rapidity with which they can be taken, and the great number which can be obtained—at least as many again as we have been able to get by any similar process,—and the ease with which the original can be effaced from the slab. One minute suffices to do this with Mr. Fellows' process, while with others it has taken us from five to fifteen minutes. When only a small number of copies are required—say half-a-dozen copies of a tracing, or bill of quantities—black ink can be used, an advantage peculiar to this process, so far as we know. The apparatus is well made to stand office wear and tear, not a mere toy, as some of the productions are we have come across, and the prices and terms on which it is supplied by Mr. Fellows are very advantageous to customers.

The programme of the Society of Arts for its 126th Session has just been issued. It gives a list of the papers and lectures for the Session, so far as they have been arranged. The following are the papers to be read at the evening meetings previous to Christmas:—November 26—"Suggestions for Dealing with the Sewage of London," by Major-General H. Y. D. Scott, C.B., F.R.S. December 3—"Apprenticeship: Scientific and Unscientific," by Sylvanus P. Thompson, D.Sc., Professor of Applied Physics at University College, Bristol. December 10—"Art Vestiges in Afghanistan: the Result of Some Recent Explorations in the Jellalabad Valley," by William Simpson. December 17—"The Panama Canal," by Captain Bedford Pim, R.N., M.P. The dates of the papers after Christmas are not announced, but the following are among the subjects to be treated:—Gas Furnaces and Kilns for Burning Pottery," by Herbert Guthrie, C.E.; "Art in Japan," by C. Pfoundes. Three courses of "Cantor Lectures" are to be given. The first course is by Charles Graham, F.C.S., F.I.C., Professor of Chemical Technology at University College, London, on "The Chemistry of Bread and Bread-making." The second, on the "Manufacture of India-rubber and Guttapercha," by Thomas Bolas, F.C.S. The third by R. W. Edis, F.S.A., on "Art Decoration and Furniture." The first meeting of the session will be held on the 19th inst.

The Slade Professor of Fine Art, at Oxford, Mr. W. B. Richmond, changed the hour of his inaugural lecture, originally fixed at 11 a.m., on Wednesday week, to the more convenient time of 3 p.m., and was rewarded by a crowded audience so crowded, indeed, according to the *Guardian*, that one or two ladies retired in a semi-fainting condition. But the consideration so properly shown by the Professor to working members of the University, in adopting an hour likely to be more convenient to them, was rendered somewhat inoperative by the preoccupation of the greater part of the room by the crowds of ladies and non-academical persons who flock to lectures of this kind. Among the audience was Prince Leopold. The Professor, in the course of his lecture, paid a warm tribute of admiration to the genius of his predecessor in the Chair of Fine Art, and to the value of his teaching in stimulating a love for all that is beautiful and true; and alluded to Mr. Ruskin's munificent gift of drawings to the University. He also indicated the course of practical instruction which he proposes to carry out in the School of Art; and dwelt particularly on the importance in artistic education of a thorough study of the human form, such as was pursued by Michael Angelo and other great artists.

The usual fortnightly meeting of the Liverpool Engineering Society was held at the Royal Institution, Colquitt-street, on Wednesday evening last, the 5th inst., Mr. M. E. Yeatman, M.A., President, in the chair; when a paper entitled "Notes on Sewers and Sewage" was read by Mr. E. H. Allics, member of the Association of Municipal and Sanitary Engineers and Surveyors. The author divided his subject into four parts. 1st. Drainage works, both ancient and modern. 2nd. The sewer in its relation to public health. 3rd. The form, construction, and ventilation of sewers, and 4th. The disposal of sewage. After glancing at the construction of sewers by the Romans, and others down to our own times, the author went on to show how great an effect the sewer had on public health, and how important it is that work of this description should be properly designed, carried out, and kept in repair. He treated at considerable length of the ventilation of sewers, and the various methods proposed from time to time for effecting this object, advocating the system of open grid ventilators at frequent intervals and condemning the use of charcoal in lever ventilators. In conclusion he treated of the disposal of sewage, and showed how the difficulty of dealing with this part of the question has increased of late years. The author does not believe in any of the chemical treatments of sewage being made to pay at present, in proof of which he stated that at least nineteen-twentieths of the sewage of Great Britain is still thrown away. He advocated agricultural irrigation as the least expensive mode of disposing of town sewage when there is no direct outlet to the sea, and gave the area required for this purpose per head of population.

An inquiry as to the effect which the discharge of the metropolitan sewage into the Thames in its present northern and southern outfalls has had upon the navigation of the river was commenced on Tuesday morning, at the Institution of Surveyors, Westminster, before Sir C. Hartley, the umpire appointed by the Board of Trade, Captain Douglas Galton, C.E., the arbitrator appointed by the Thames Conservancy, and Mr. Bramwell, C.E., the arbitrator nominated by the Metropolitan Board of Works. The inquiry is the outcome of a long correspondence which has been going on between the parties to the arbitration for several years, and the claim of the Thames Conservancy is based upon the 20th and 21st sections of the Thames Navigation Act of 1870, which provided that any banks or other obstructions of the navigation of the river which might arise from the discharge into it of the sewage of London must be removed by the Metropolitan Board. On behalf of the Thames Conservators Mr. Pope traced the history of the Conservancy Board from its origin in 1857, and pointed out that while they had powers to prevent rubbish and sewage being thrown into the Thames, and to cause the surface of the river, as far as practicable, to be effectually scavengered with a view to the removal therefrom of substances liable to putrefaction, the rights of the Metropolitan Board to provide for the sewage of London were maintained subject to the restrictions already alluded to. Evidence was called in support of Mr. Pope's statement and of certain diagrams and charts which were put in, and the proceedings were adjourned.

The Council of the Institute of Civil Engineers have just published the annual list of subjects upon which they invite original communications, either for reading and discussion at the weekly meetings, or for printing in the minutes of proceedings. The list suggests some 48 subjects, including the most useful sections of rolled iron for structural purposes, experiements on the strength of materials used in construction with descriptions of testing machinery, the forms of staging, scaffolding and centreing used for the support of structures during erection, the resistance to traction of modern vehicles on modern roads, the construction of masonry dams for and tunnel outlets from storage reservoirs, the flow of water through pipes and conduits, the mechanical separation and chemical treatment of sewage, the determination of flow of rivers, the disposal and utilisation of slags, and the proportioning of mains for water and gas distribution. For approved communications the council will award premiums arising out of four special funds bequeathed for that purpose.

CHIPS.

The parish church of Ardleigh, between Colchester and Manningtree, is about to be restored at a cost of £4,000.

A line of railway now being surveyed is proposed to be run from Haverfordwest, where it forms a junction with the Great Western system, to St. David's and White Sand Bay. Should this be carried out, St. David's will no longer be the only British cathedral city inaccessible by rail.

The local board of Southend-on-Sea contemplate the erection of a new pier with a tramway worked by steam, and also the construction of a new loading pier and the enlargement of the existing pierhead. The total estimated cost of the projects is £23,000.

An inquiry was held at Bridport on Friday, before Major Hector Tulloch, Local Government Board inspector, with reference to an application from the Local Board for sanction to borrow £1,500 for the completion of the drainage works. No opposition was raised to the scheme.

Memorial stones of a new Wesleyan chapel were laid at Retford on Thursday in last week. The building will cost £6,000, and is being erected from the designs of Mr. Bellamy, of Lincoln.

A new mission church, dedicated to St. John the Evangelist was opened at Marshside, Chislet, on the 20th ult. It is built of brick, and has a bell turret; the interior fittings are of stained deal. Mr. Joseph Clarke, F.S.A., is the architect, and Mr. Wilson, of Canterbury, the builder. A hundred sittings are provided.

An attempt made at Thursday's meeting of the City Court of Common Council to rescind the award of £50 premiums to the authors of the designs for the City of London School distinguished as "L.," "Move," and "Palmam qui meruit ferat," was defeated by a large majority. At the same meeting it was decided to expend at the Mansion House £1,810 on alterations and £1,590 on furniture.

The Liverpool corporation has successfully negotiated for the purchase of the tramways in that town for £30,000, and will lease them to the present Tramways Company at an annual rental of 7½ per cent. per annum on purchase money and cost of maintenance and reconstruction, the further tramways sanctioned by the Act of the present year to be leased when constructed at a 10 per cent. rental.

At the recent Lincolnshire assizes, the vicar of Laughton-by-Gainsborough was held to be personally responsible for the restoration of the tower of Laughton Church.

Mr. H. D. Appleton has been appointed surveyor for Sutton, Surrey.

The Local Board of Horwich, near Bolton, last week adopted a scheme for building a reservoir for water at Lord's Height, at an estimated cost of £1,150.

At a meeting held at the Athenæum, King's Lynn, last week, a school of art was formally established as an addition to the science classes. The teacher is Mr. Bearcroft, of Downham.

At Watford Petty Sessions Mrs. Tete, a young married woman, has been remanded on a charge of having obtained by false pretences the sum of £820 from Mr. Thomas Harold, a Leicestershire architect and surveyor. The allegation is that defendant represented herself as a single woman, whereas she was married, and that during the period of courtship "Miss Ellis" obtained various loans from her lover.

Schemes of water supply and sewerage are at present being carried out in the burgh of Forfar, and the estimated cost of execution is £14,485.

The work of reseating the choir of Canterbury Cathedral is nearly completed, and the reopening will take place on Tuesday week, the 18th inst.

A new Primitive Methodist chapel is approaching completion at Worksop; Mr. John Alsopp, of that town, is the architect.

A new organ built by Mr. F. W. Nicholson, of Bradford, was dedicated in the parish church of Blyth, Lincolnshire, last week.

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Lamplough's Pyretic Saline is Refreshing, most agreeable, and the preventive of Fevers, Biliousness, smallpox, skin diseases, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[Advt.]

Holloway's Pills are the sheet-anchor of the confirmed dyspeptic. A few trials will prove their potency in removing indigestion, biliousness, nausea, eructations, loss of appetite, want of sleep, and that utter weariness which always waits on a foul and disordered stomach. They act as alteratives, sedatives, and gentle aperients.—[Advt.]

MEETINGS FOR THE ENSUING WEEK.

Monday.—Institution of Surveyors. Presidential address by Mr. William Sturge. 8 p.m.

Wednesday.—St. Paul's Ecclesiological Society. Conversazione at St. Paul's Chapter House, E.C. 7 to 10 p.m.

CINDER-SIFTING ASH CLOSETS.
Superior to Earth Closets. For Gentlemen's Houses, Cottages, Schools, &c.
NO DRIED EARTH REQUIRED.
The Sanitary Appliance Co. (Ltd.), Salford.

Trade News.

WAGES MOVEMENTS.

Newcastle-on-Tyne.—The joiners' wages here have been reduced ¾d. per hour, commencing on Monday last.

CHAPPUIS' PATENTS
FOR
REFLECTING LIGHT.—DAYLIGHT REFLECTORS
OF EVERY DESCRIPTION; ALSO
ARTIFICIAL LIGHT REFLECTORS.
P. E. CHAPPUIS, Patentee. Factory, 69, Fleet-street, London, E.C.
N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION

THE BUILDING NEWS.

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LONDON, FRIDAY, NOVEMBER 14, 1879.

HISTORICAL TOMBS.

THIS class of monuments, whether dedicated to affection or to pride, has always possessed a supreme interest for the human mind. It represents, as it were, the one effort of men to confer upon their fellow-creatures an immortality on earth, and in a sense, so far as secular records go, it has succeeded. The name of Mansolus has entered into the language of nearly every civilised nation. The Tombs of the Kings in Egypt; that of Agamemnon with its treasures; that of Artemisia, alone preserved among the ruins of Boudroun; those of Armes at Gouneh and Cheops at Giseh; not to speak of Charlemagne's sepulchral trophy at Aix-la-Chapelle, or Napoleon's tomb at the Invalides, are great tablets upon which many pages of history are written. It is true that in modern times we do not, as in the ancient, discover much of that which belongs to a nation's chronicles among its graves. That has been rendered unnecessary, though why the sarcophagi of such men as Wellington and Nelson should have been buried out of sight in the seldom-visited crypt of a cathedral is a question which future generations will continue to ask. Still the spirit of the age is very largely expressed in such dedications as, for example, those to the fifth Pope Adrian, and to the first Emperor of the French; and, in a minor rank, those of Cherubini at Paris, and Francis of Austria at Brussels. Moreover, during upwards of a thousand years, the interest of Christendom has centred in that one spot, for ever sacred, the Holy Sepulchre. It has happened, however, fortunately for art, that a vast number of these monuments were erected in honour of the very architects who designed them, and this was especially the case in the thirteenth century, in the churches belonging to which period the effigy of the artist may constantly be found in contiguity with that of the Bishop or Abbot who employed him—thus, that of Hugnes de Plailly, who modelled in copper a portrait figure of Queen Isemburga; Claude Alpais, who wrought a cup and cross for the monks of Montmajour; Clement, the glass-colourer of Chartres, who illuminated a window above the tomb of its founder. In the cloisters of Toulouse repose the remains of many among its sepulchral architects, also at Rouen and Saint Denis. It was far different in the antique times. Then, the names of those who commanded the structure to be reared were commemorated, but the builders themselves were forgotten, consummate masters though they were, as is witnessed by the tombs, mighty in their magnificence, of Porsenna, Augustus, Adrian, Septimus Severus, and others which, without being so colossal as the Pyramids, really equalled them in splendour. Those were days, however, when the famous dead men were not set apart in "cities" of their own: their "houses" lined the great thoroughfares; they ranked above palaces. But this was by no means a universal method, beyond the limits of Europe especially. Among the fragments extant of that which is supposed to have been the Chaldæan Ur, have recently been discovered the distinct outlines of a Necropolis, containing numerous coffins, painted of a brilliant vermilion red, and richly ornamented, in bas-relief. The graves were, at this place, frequently lined with brickwork, bearing Cuneiform inscriptions. The French of late have taken to imitate the polychromy, so common in old Egypt, and the tomb of Dumont D'Urville is a singular illustration of colour applied to such a purpose. The life of the famous navigator and geographer is, indeed, depicted upon the surfaces, exterior and internal, of his mausoleum, in addition to a variety of hieroglyphs, emblematic signs, sculptural decorations, and so forth, suggesting rather the worst eccentricities of Highgate or Kensal Green than the work of any Greek or Roman epoch—a medley, in fact, wherein a group of sea-horses appear to be trampling upon the figure of the Venus of Milo, confused amidst a chaos of allegory. The Greeks decorated their tombs, it is true, but certainly in a different style, and even in India, as in the royal burial-place of Seringapatam, the adornment surrounds the tomb, instead of being lavished upon it. In the early Christian times, indeed, so pure and graceful were thought the forms which paganism gave to these edifices of death that they were adopted as altars in many of the Latin Basilicas, and particularly where, being discovered underground, they were suited for the purposes of secret, or, at any rate, unostentatious, worship. It is curious, to note how uniform — monotonous even — the Romans were in this respect. Their tombs, whether unearthed at Epernay in France, or at Naples, or in Spain, bear one character invariably, though this contrasts signally enough with the mortuary relics of Lycia, with their ogival roofs, and still more so with those of Thera, Telmissus, Cyrene, and Myra. As for the Macedonian monument at Pydna, like that of Mausolus, it stands alone.

Among more modern sepulchral edifices which may be described as historical, are the tombs of Bandin, at Paris; of the Cardinal de Bourbon, at the Chartrense Monastery de Gaillon—a superb piece of work of the Dukes of Burgundy in their ancestral home; of Diana de Poitiers, at Anet—the principal part of which was sold for £10 to a speculator—of the Guises,—and of Gay Lussac. But of all the structures of this class which, in recent days, have provoked criticism and controversy, none has approached in interest the tomb of the first Napoleon, at the Invalides, near Paris, and which, strangely enough, is not yet completed. We cannot enter sufficiently, of course, into the life of the generations which built the monuments of Mausolus or Agamemnon, to appreciate whatever of popular feeling may have floated round the arrangement of their graves; while, with respect to the imperial and royal tombs of Charlemagne at Aix-la-Chapelle, in Notre-Dame, and in Westminster Abbey, together with those of Queen Frederica at Herrenhausen and Queen Fredegonde at Saint Denis, they are mere representatives of a prevalent style, and possess no significance beyond that. But, in the case of the dead Emperor, who was brought from St. Helena, and who, at one time, threatened to claim as many burials as Christopher Columbus himself, the question became a national one, and the entire art-science of France was concentrated upon it. An investigation was first instituted on the point, whether a resting-place for those historical ashes, above or below the soil would be preferable, and the discussions that followed were memorable. In the result a pleasant effect was produced, and the bones of the conqueror repose in the centre of a kind of well, surrounded by the tombs of his marshals. More than eighty designs were submitted, and the most costly was chosen. France could not bestow too much upon the urn of her hero, and determined, once for all, to do for it what Alexander the Great is recorded to have done for the ashes of Achilles and Cyrus, and what Napoleon himself did for Frederick the Great. There are not a few Frenchmen, however, who may still remember the eighty projects which competed for fame—the hideous symbolisms, the gigantic specimens of military swagger, as though death itself had been defeated, the mock Classics, and still more mock Mediæval, and the grotesque combinations that were offered to the approval of the public. There were equestrian, standing, and recumbent figures, with multitudes of bas-reliefs from battle-fields and senate-halls—Marengo, the Concordat, Aboukir, the Coronation, in effective contrast: and even then the battle between "above" and "under" ground continued to be waged—though, at length, a compromise was effected; the body was not, in the ordinary sense of the term, buried, but deposited in a hollow, below the level of the common earth, after the suggestions, more or less, of Duban, Nicolle, Duc, Floreau, Tokin, and Vigneux, who, however, were exceedingly varied in their designs. One proposed a recumbent effigy, overshadowed by a vast crown; another, a sarcophagus of porphyry, surmounted by statues of marble, and encircled by cornices of bronze; a third, a pyramid, surmounted by a statue in imperial robes, with golden eagles at each corner, the Roman fasces signifying authority, and the arms of the Empire upheld by War, Law, Art, and Science. There were apotheoses in every shape, and Victories without number; in fact, the whole architectural and sculptural genius of France appeared to have been raised by this unprecedented emulation for success in which the successful competitor was to receive £20,000—the sum awarded for our own deplorable Wellington monument—which, however, is totally distinct from the Wellington tomb, a dislocation, so to speak, not for a moment contemplated at Paris, where the tomb and the monument were to be, as it was only fitting they should be, one. Among the rest, the scheme of M. Etex was, perhaps, about the most striking—a colossal Cæsarian figure on horseback, bestriding a globe, with eagles spreading their wings around, and a stupendous black marble pedestal beneath. The effigy of the man was in gilded bronze; the bas-relief, the columns, and the canopy were of white marble; beneath the centre, the body would have lain, in a sarcophagus hollowed out of a single stone; indeed, most of the competitors agreed on this last point, and that the material should be brought from Corsica. Then, of depositories placed entirely above the level of the soil, there were not a few—designs of vast marble chests adorned with draperies, some of them modest and simple, others reaching almost to the dimensions of a church. Finally, the designs of the Italian Visconti was adopted, and Europe was searched for materials wherewith to carry it out. This artist clung to the Invalides as the true cenotaph for a soldier, whereas Delaroche and Horace Vernet had urgently advocated the choice of the Madeleine. But the original project was considerably modified in course of execution, though, in the main, its principles were preserved—a statue of the Emperor at the door of his own tomb; subterranean galleries enriched with many tinted marbles and tablets of bronze; one incessant legend of the Empire running in sculpture and inscriptions through them, and converging towards the central sarcophagus; monuments of the Marshals—monuments of the Governors who had ruled over that soldiers' asylum—the Greenwich Hospital of France—two blocks of Corsican granite—one for the coffin, another for the lid—a single word engraven and emblazoned, in letters of gold—on the stone—and that word "Napoléon," without other designation or any date,—this was the simple plan which ultimately recommended itself to the mind of France. There was to be a new dome, encircled by arcades of marble, with statues at intervals, and the defeated of Waterloo was to lie midway between the tombs of Vauban and Turenne. But he could not be put upon a level with them; that might suggest a parallel; he could not be elevated above, for this would necessitate a clumsy height, for height's sake merely; consequently, it was resolved to put him where he at present lies. The history of this modern experiment in sepulchral architecture, now that it is about to be reopened, is a singularly interesting one,—not less so, perhaps, than those other histories which are classic, and which relate to the tombs of long-exhausted dynasties and races of kings and men, in Egypt, Greece, Rome, Etruria, and the far past, wherever it possessed either arts or civilisation.

THE SILTING UP OF THE THAMES.

THE vexed question of whether or no the discharge of 120 million gallons per diem of raw sewage into the Thames at Crossness and Barking does or does not make any perceptible difference in the accumulations of mud which are to be found in the navigable channel of the river, is now being seriously inquired into by two arbitrators appointed by the Metropolitan Board of Works and the Thames Conservators respectively, and an umpire chosen by the Board of Trade. A formidable array of Queen's Counsel are retained by either side, and some 200 witness are, we understand, to be examined. That such a solemn farce should be played out in our midst, without one word of protest from those who ought to come forward and prevent such a squandering of public money as an arbitration of this kind must involve, is too much to expect; and without in any way seeking to influence what must surely be regarded as a foregone conclusion, we propose to glance briefly at what evidence has been already produced and what scientific men have stated upon this very subject.

It may not be amiss to premise our remarks by a brief estimate of the solid suspended matters which would be contained in the Metropolitan sewage. To guide us in arriving at the total weight of the solids which must be annually discharged into the Thames, we have a host of observations and analyses contained in the various reports of the Royal Commissions on the Pollution of Rivers, and on the Main Drainage of the Metropolis, also the report of the referees appointed by the Metropolitan Board of Works to investigate into the question of the Main Drainage of London in 1858, and those bearing upon this subject by the officers of the Metropolitan Board and the Thames Conservancy Board. The estimates of the amount of the solid matters vary very considerably—more, in fact, than we should have been prepared to find; but even at the lowest figures many hundreds of tons per diem of polluting matters must find their way into the river, either to be carried out to the sea and for ever disposed of, or to be deposited in the more quiet reaches of the Thames in vast shoals and mud-banks reeking with putrefying organic matter. Each gallon of London sewage weighing 70,000 grains troy holds in suspension some 120 grains of solid matters, together with 80 grains of mineral and organic matters in solution, making 200 grains, or 1-350th part of its total weight of impurities. We assume these constituents as being a fair average, for analyses differ very materially, varying from 150 to 250 grains of total impurities per gallon. This, it must be understood, represents the polluting ingredients of the ordinary dry-weather flow of London sewage-water, and takes no account of the increase of detritus brought down in times of heavy rainfall. If now we proceed to multiply out the 120 grains of solids by the total number of gallons per diem for the whole year, we obtain the enormous sum of 335,070 tons which must, somewhere or other, be deposited in the sea or in the river bed. This estimate is considerably lower than some which have appeared, and it makes no provision for storms and floods and the extra quantities of suspended matters which are at such times brought down in the sewers. If we take 1,000 tons, reckoned dry, or 10,000 tons in the form of mud or sludge, such as might be recovered from a depositing tank or reservoir, we shall not be far wrong in our estimate of the magnitude of the amount of solid matters discharged into the Thames every day.

We will now glance at the early history of the main drainage question, in so far as the choice of outfalls is concerned. The Metropolitan Local Management Act of 1855 laid upon the Metropolitan Board of Works the duty of making "such sewers and works as they may think necessary for preventing all or any part of the sewage, within the metropolis, from passing into the River Thames in or near the metropolis." The wording of the Act was very clear, and it was impossible for the Board to delay any longer in taking active measures for the prevention of what 25 years ago was becoming a gigantic evil. Before, however, the Board were to take any steps in carrying out any sewers or works in furtherance of this object "the plan of the intended sewers was to be submitted to the Commissioner of Her Majesty's Works and Public Buildings," and no such plan was to be carried into effect "until the same had been approved by such Commissioners." The Act clearly contemplated that the main drainage of London should be carried out in conformity with the views of a Government Department, as all the plans had to be sanctioned by the Office of Works.

At the latter end of the year 1856 the plans which had been prepared for the main drainage of London were accordingly submitted to the Commissioners. The original proposal of the Board, as submitted to the First Commissioner, was to discharge the sewage of the Metropolis at a point in the Greenwich marshes, after the heavy particles had been deposited by subsidence. The then First Commissioner, Sir Benjamin Hall, instructed Messrs. Simpson and Hall and Captain Galton, R.E., to furnish him with a report upon this scheme. These gentlemen drew up a report, which was presented to Parliament on August 3rd, 1857. We need not now do more than touch upon a few of the general conclusions arrived at by these gentlemen, after a careful examination of all the facts. They objected to several very important features of the scheme prepared by the Board, and among other points the selection of the outfall was emphatically condemned. They considered, moreover, that the plan failed to make a sufficient provision for the future. After a painstaking review of all the facts, they concluded that looking to the difficulties in the way of utilisation, the best mode of disposing of the sewage of the Metropolis was to place it where it would be rapidly and certainly mixed with large volumes of water and be finally carried out to sea. They pointed out that the most suitable spot for securing this object would be an outfall in Sea Reach, sixteen miles lower down the river than the present outfalls, and seven miles below Gravesend. The point they selected had many arguments in its favour. The Thames is there more than a mile wide, the ebb tide sets along the northern shore, while the flood tide with fresh water comes in along the southern shore, and the strength of the current is sufficient to prevent any deposit of sewage matters in the bed of the stream. The shores, too, at this point are almost uninhabited, and the large expanse of water, added to the rapid current, would insure the thorough mixture of the sewage.

It was not to be expected that such an adverse report would remain unchallenged, and the Metropolitan Board of Works referred the matter to Messrs. Bidder, Hawksley, and Bazalgette, who entered into the subject in the most exhaustive way and presented their report on the 6th April, 1858. In the mean time, however, while the matter was still under the consideration of the Office of Works, a change in the Government occurred, and the new Government took an entirely different view of the whole question. They decided upon leaving to the Metropolitan Board of Works the responsibility of dealing with the sewage of London, and an Act was passed in 1858 which repealed the clause in the former Act to which we referred requiring the approval of Her Majesty's Commissioners of Works and Public Buildings to the Metropolitan drainage scheme. The main drainage scheme of the Board was accordingly carried into effect, and in 1863 and 1864 the outfalls at Barking Creek and at Crossness came into operation, since which time the raw sewage of London has daily been discharged into the Thames.

The magnificent system of sewers which convey away the polluted waters of London having been completed, the officers of the Metropolitan Board of Works seem for a time to have imagined that they had done everything that was needed in the way of sewage disposal, and might now rest after their labours. Their chief engineer Sir Joseph Bazalgette could even assert authoritatively that "the main drainage of the Metropolis has been carried out and completed under the powers of a special Act of Parliament," and could silence and stifle all discussion by showing that in the Rivers Pollution Prevention Act of 1877, London alone, of all the towns in the country, the greatest sinner among them all, was specially exempt from the operation of the Act. Sir Joseph has always been forgetful of the conditions which were most clearly stipulated and understood at the time his plan was adopted, that previous to casting the sewage into the Thames, it should be deodorised and clarified by the best known practicable process. The Board have, it is true, advertised in a desultory sort of way for persons to come forward and treat their sewage; they took a very heavy sum, by way of caution-money, from a company who proposed to reclaim the waste land of Essex, and stood by while the scheme of the promoters died a lingering death for want of capital. They played with the Native Guano Co. at Crossness, and they have from time to time expressed their willingness to allow sewage companies and inventors to try experiments to any extent, provided they were willing themselves to bear the expense, on the principle of "It pleases them, and does not hurt us." But in all this they have taken very good care to avoid doing anything which might commit themselves to a policy of treating the sewage chemically, or otherwise, at the outfall.

There is another body, however, whose interests in the Thames are of far greater importance to the prosperity and well-being of London than those of the Metropolitan Board of Works, who seem to regard our great "highway of commerce," as little better, as we have seen, than a common sewer. We allude to the Conservators of the River Thames, who appear from the outset to have watched the operations of the Metropolitan Board with an observant eye. It having been reported that in 1867 a vessel had unexpectedly touched ground while passing the Crossness outfall, a new survey of the locality was ordered to be made, and this showed that a mudbank, in some places seven feet thick, had been formed in a spot where formerly there was a depth of from seventeen to nineteen feet, with a clear gravelly bottom. Owing to this discovery, periodical surveys were ordered by the Conservators to be made, who found that in spite of all dredging, an accumulation of mud, corresponding exactly in composition with the matters subsiding from London sewage, was being formed over an area many miles in extent of the bed of the Thames. Concerning these deposits, a very lengthy correspondence has taken place, and a report addressed to the Conservators and specially prepared by Captain E. K. Calver, in June, 1877, brought matters to a climax. The "Thames Act" of 1870, in its fourth section, gave to the Thames Conservancy a remedy for the evil they had proved to exist. It provided that "the Metropolitan Board shall, at their own expense, keep the Thames free from mud-banks, or other obstructions to the navigation thereof, as may have arisen, or may arise, from the flow of sewage from their outfalls for the time being into the river; and for the said purpose, the said Board shall have full power and authority from time to time to dredge the said river, and to remove the said banks and obstructions; but all such dredging operations shall be subject to the approval of the Conservators, and, if they so require, be carried on under their superintendence."

On the strength of this clause, an arbitration has been called for, and probably before the end of the year and at the expense of a few thousands of pounds of the ratepayers' money, we may again be assured that the London sewage does cause a deposit in the river, and that it would be advisable to take out the solid matters from the sewage in the first instance, rather than turn them into the river, from whence they must be removed by costly dredging operations and conveyed to land to be acquired for their reception.

ARCHITECTS' ESTIMATES.

As various questions and letters we have received indicate the old tale of architects estimates exceeding the anticipated cost on the parts of clients is still a frequent source of difficulty and unpleasantness, last week we published a very sensibly written letter from Mr. F. W. Lockwood, in which the writer represented pretty fairly the usual expectations formed by employers, and the complications which afterward arise when the actual cost has to be paid. We have on more than one occasion urged the necessity for architects being a little more explicit and plain-dealing about the cost of their designs. It is very true, as Mr. Lockwood says, that a client too frequently comes to an architect expecting to get fifteen hundred pounds worth of work done for a thousand. The client has been smitten by a house built by his friend who has been his own architect, and who, like many people who are their own builders, but who do not wish to tell what they have really had to pay for their ignorance of house-building, conceals the real cost, and names a sum that is misleading. The client, at any rate, fancies he can do something better for the same money if he employs an architect, and falls into the error of supposing he can build as cheaply as his friend, who may be a speculative builder. He forgets, probably, to add the architect's commission, which is, however, a trifle, if he obtains for the services rendered a *quid pro quo* in the shape of better materials and workmanship. But he forgets—and it is one of the commonest causes of misunderstanding—that the very employment of an architect increases the builder's estimate of the cost. Many tradesmen will add a percentage to their tenders when they know they will be obliged to work to a set of plans and specifications, and it is this fact that operates prejudicially against the employment of a professional supervisor. The conditions of sound building and correct architectural design, like other things, have to be paid for proportionately, but are seldom considered by the employer. In tenders for small classes of house property the additional cost so entailed seems out of proportion to the advantages derivable from professional supervision, and it is not to be wondered that the architects are so seldom engaged in house-building of this kind. We cannot but regret the circumstance that the architect's services are thus confined to buildings of a costly class, and that he has come to be looked upon as an expensive luxury rather than a necessity. Unfortunately, also, the results of bad building are not immediately felt by the employer; bad bricks and green unsound timber, shrinking floors and warping fittings can be put up with by the ordinary building owner who estimates the value of his houses by the return of the rental value of his property. Tenants are found who will pay the same rent for an ill-built and badly-designed house that they will pay for one carried out from an architect's design, and we have, therefore, to face an evil of an aggravated kind.

To strike at the root of the mischief architects must endeavour to realise the position of their employers. They ought to exercise all the caution in their power to restrict expenditure within moderate limits. At present the estimate of the architect is a by-word. There are very few that are more than mere guesses. It cannot be denied that the plan of cubing buildings lies at the bottom of the false estimate, but another strong incentive to underrate the cost of a building arises from the architect's desire not to frighten his client at the onset. To cube a building is a very permissible thing to do when a rough idea of the cost has to be speedily obtained; it may be employed with some degree of accuracy when the prices per cube foot of similar buildings which have been actually erected are known; for example, small houses and villas ranging from a few hundred to two or three thousand pounds may be thus calculated with some degree of precision. It may also be employed as a kind of collateral proof of an estimate's accuracy when arrived at by the usual method of taking out quantities; but we have no faith in the system when, as often happens, the data for accurate pricing cannot be ascertained from actual personal experience. For instance, how can an architect, whose practice has been confined to a certain class of houses in his own locality, estimate by this method a building, such as a town hall and public offices 200 miles away, to be built with the local materials? The plan he generally adopts is to ascertain the cubage of another building, in another place—a kind of information rarely, if ever, obtainable from any reliable source, other than one's own calculation, or he compares the cost of an executed building in a rough manner. After all, it is a very clumsy method, and we cannot say it is always an approximate one, for there are often new factors to be taken into account. Another source of inaccuracy has been hinted at by our correspondent: it it is that of making the total cost we desire the factor of the price per foot, instead of the price per foot the factor of the total sum. Though such an inverse and absurd mode of proceeding can scarcely be seriously placed to the credit of the profession, we are convinced that the total is frequently made to tally with a figure settled in the mind of the estimator beforehand, and that the unit of cost is adjusted accordingly. It is for the profession to remedy the causes of complaint referred to, by clearly making their clients understand at the onset that professional aid means expense, and that a careful estimate of cost entails the labour of several hours' work, in the preparation of the necessary data for calculation, in the meanwhile refusing resolutely to give anything more than an approximate idea of the probable cost of the projected work.

EDWIN EDWARDS' PAINTINGS AND ETCHINGS.

An extremely interesting exhibition of the works of an individual artist, the late Mr. Edwin Edwards, is now open at the Continental Galleries, 168, New Bond-street. These works comprise a collection of oil-paintings, several water-colour drawings, and a number of etchings of considerable merit. Mr. Edwin Edwards, though known for his powerful paintings of coast scenery, had a wide reputation as an etcher, and his contributions to the Black and White Exhibition are probably well known to many of our readers. It is certainly a matter for remark that so vigorous a master of the brush should have been able to turn his hand also to the delicate art of etching; but those who can afford the opportunity of visiting the exhibition in New Bond-street will at once acknowledge him a master of both arts. In the painting gallery we are struck with the size of the canvases and the boldness of execution of the subjects. Take, for example, the picture No. 4, "St Mary's, Scilly Islands," a vigorously-handled landscape, broad in its masses of coast and water; or the grand picture, of panoramic dimensions, or "By the Thames at Sunbury" (56), exhibited at the International Exhibition of 1872. In both pictures we are struck no less by the remarkable effectiveness of the masses than by the solid painting and the crispness of the light and shadows. Minute finish or delicacy of detail is, of course, not to be looked for in these pictures. To be seen to perfection the visitor must take his stand at several paces from the canvas, and from such a point of view he can fairly estimate the masterly delineation of rocky foreground, crested wave or massive foliage. A nearer inspection reveals a thick laying on of paint, especially in the high lights; the detail is lost, and we wonder at the precision and touch which are productive of the stereographic effect. "London from Greenwich Observatory" (10) is a finely painted subject in which the turrets of the Observatory stand up in forcible contrast to the smoky landscape of river, houses, and masts. Foliage and sea appear to be the *forte* of Mr. Edwards' pictures, and his views of the "Cornish Coast" are both numerous and masterly in the grandeur of the features depicted. No. 14 is one of these, the "Pond, Kempton Park" (23), another, with its dark elms and water. "Boscastle Harbour" (26) is a very fine piece of sea-painting worthy of the pencil of Turner, Gainsborough, or Constable. The bright blue water in "Walberswick" (61) is also very truthful. The "Pond, Kempton Park" (34) represents summer, and is as charming a piece as the winter scene of the same subject. "Deep Corner, Ipswich" (39), "Kynance Cove, Cornwall" (48), "Southwold Beach," "The Tow Path, Sunbury," the "Thames at Sunbury" (56), "Ruins of Dunwich," "Gainsborough Lane" (86), are all very fine examples, masculine in the vigour of execution and the depth of light and shade. Views on the Thames were favourite subjects of the artist, and there are several scenes at Sunbury, Walton, &c. The architectural subjects, of which there are a few, betray in many instances faults in drawing and detail. We particularly notice these defects in No. 16, "View of the Houses of Parliament," "Dysart House" (51), "Ham House" (60), "Ruins at Dunwich" (66), "Conway Castle," "The Building of Blackfriars Bridge," "Porch, Wootton Church," most of them excellent in colour and displaying much feeling for powerful contrasts, breadth, and chiaroscuro. The grand cedars in No. 56, the wintry leafless trees in "Ham House" and "Gainsborough Lane," with their interweaving branches painted against bright skies, and "The Old Trackway, Stavendon Park," atone for many of the shortcomings in the architectural pictures; undoubtedly a few of these like "Durham" (83), "Ham House," and the "Building of Blackfriars Bridge" are thoroughly artistic works. Many of the pictures we have named have been exhibited at the Royal Academy.

The water-colour drawings are the least successful part of the exhibition. There are a few, however, that must be mentioned as examples of this artist's power of turning his hand to this less powerful mode of delineation. We may draw attention especially to the charming colour and boldness of handling in the trunk and foliage of "Harcombe" (255), the pond in "Kempton Park" (256), "Under the Chestnuts, Burgate" (276), "Ehrenburg" (268), the stump of tree in the "View of Staines" (289), and a few other charming sketches of river scenery. Two or three subjects from Norwich and Durham claim attention, as also the fine blending of colour in the view at Fontainebleau. The "Ruins of St. Werner's, Bacharach" (247), is a beautiful sketch of the rich apsidal-ended church, but poorly drawn in the tracery; the arches of the "Ruins of Roman Baths, Treves," are rather queer, and the sketch of the towers of St. Paul's, from "My Window, Doctor's Common's" faulty in perspective. The View at Guildford (280), recalls a pleasing street piece, with some interesting red-brick architecture, and in most of the sketches there is the same exquisite sense of grouping and colour that mark all Mr. Edwards' pictures. The etchings are an extremely interesting portion of the upper gallery devoted to the works of this artist. Many of the subjects of the pictures are repeated. Thus we have "Ham House," "Gainsborough Lane," "London from Greenwich Park," and many etchings of Thames scenery. We take notice of a frame of six etchings on the staircase, all displaying technical and artistic skill. "Ham House" is a dark rich bit, thoroughly characteristic; No. 130, "Peterborough and Ely," are also pleasing etchings. By the way, we find the catalogue describes one as "Salisbury" by mistake. The six etchings 131, especially the "Watergate Row, Chester," and "Old Lowestoft" are admirable bits of scenery. The artist's graver has given us all the colour and solid handling of a real picture in oil. We note also Nos. 142 and 143, as excellent etchings of extreme beauty and vigour, especially the "Chestnuts at Burgate." A grand massive piece of execution is "Framlingham Castle" (149). The hill and castle are deep in shadow, and we might take the piece for a drawing in colour. One of the most interesting works of the late Mr. Edwards was the collection of etchings for his work on "Old Inns," upon which he was engaged. Many of the examples have been published. Thus we see No. 235, the galleried yard of an old Bristol Inn, and some proofs of the work in question representing many quaint and interesting features of brick and timber buildings. A sheet of description, illustrated profusely by bits of old carving, details, signs, and sign irons, is exhibited of an old inn at Stowmarket on the turnpike road between Norwich and Ipswich. The first part of Mr. Edwards' work contains the old inns of East Anglia, the plates of which have been destroyed. Whatever the shortcomings in points of drawing and detail of these etchings, they are thoroughly conscientious and artistic work, and we feel the artist has done as much as Fielding, Thackeray, or Dickens to invest the subject of old inns with a poetry entirely their own. The pictures sketched by the novelists of our country inns have been literally rendered upon copper by Mr. Edwards in this work, and we are thankful that many of these old buildings which cannot much longer be spared have been made the subjects of the artist's pencil. We note among the examples of old timbered inns the "Crown and Castle;" the "Wrestler's Inn," Cambridge; "Dolphin Inn," Heigham; and some old inns at Shepton Mallet and Bristol and other parts. The etchings of coast scenery are often as fine and expressive as works of art as the artist's oil pictures. For instance "Pardenick" (171), the "Lizard Lights" (186), are soft and delicately executed; the waves and rocky foregrounds are inimitably rendered with all the softness of colour or crayon. "Durham from the Top of the Banks" (191) is an exquisite bit of scenery; the branches of the trees and the softness of the manipulation of the towers seen through them are all that can be desired. So are the views of Peterborough and the series of etchings of old English Poplars (218), the two etchings of "Lincoln and Durham," "Building of the Thames Embankment" (223), works possessing much artistic feeling, vigour, and effectiveness. The old "Tabard," Southwark, rendered famous by Chaucer, and the "Warwick Arms," Newgate-street, are among the many antiquarian bits contained in the gallery we have noticed.

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SANITARY CONGRESS AT CROYDON.

LECTURES ON HEALTH.

THE close of the Sanitary Institute's Exhibition of Sanitary Appliances at Croydon on Saturday night was marked by the holding of a free public meeting, at which a series of popular addresses were delivered by some of the principal men who contributed papers to the Congress. The large room of the Public Hall, Croydon, was densely packed, and the proceedings passed off successfully.

The President, Dr. B. W. Richardson, F.R.S., opened the proceedings with an address on "Health at Home." That there was no place like home was a saying peculiarly appropriate to his subject, for the river of national health must rise from the homes of the nation. He would lay down a few golden rules for securing health at home; and, first, he would put sunlight. Whether your home be large or small, give it light. In a dark and gloomy house one could never see the dirt that polluted it; unwholesome things got stowed away and forgotten, the air became impure, and soon some shade of ill health was engendered in those persons living in the house. Not only was the mind saddened in a home that was not flushed with light, but sunlight was of itself directly useful to health. The practice of placing sick people in dark and closely-curtained rooms was alike pernicious to body and spirit; and, moreover, he had found by experiment that certain organic poisons analogous to the poisons which propagate epidemic and contagious diseases were rendered innocuous by exposure to light. He would next refer to the allied topic of night and hours of sleep. If it were good to make all possible use of sunlight, it was good equally to make as little use as possible of artificial light. Artificial lights, so far, had been sources of waste, not only of the material out of which they were made, but of the air on which they burned. In the air of the closed room the present commonly-used lamps, candles, and gaslights, robbed the air of a part of its vital constituent, and supplied in return products really injurious to life. Gaslight was in this respect most hurtful, but the others were bad when long kept burning in one confined space. The fewer hours after dark that were spent in artificial light the better, and this suggested, of itself, that within reasonable limits the sooner we went to rest after dark the better. It was of the greatest importance in a healthy home to let every person have a separate bed, and the clothes should be light and warm. As the bedroom was the room in which one-third at least of the whole life was passed, that ought to be the room on which most trouble after health should be bestowed. The rule followed was the reverse of this. The bedroom should be so planned that never less than 400 cubic feet of space should be given to each occupant, however good the ventilation might be. The walls should be coloured with distemper or with paint, that, like the silicate paint, could be washed three or four times a year. The windows should have nothing more than a blind and a half muslin curtain. The floors should have carpets only round the beds, without valances from the beds. The furniture should be as simple and as scanty as was possible, the chairs free of all stuffings or covers that could hold dust. Of all things, again, the room should be kept clear of vestments not in use. From time to time a fire should be made in every bedroom, that a free current of atmospheric air might sweep through it from open doors and windows. Dry scrubbing was by far the best mode of cleansing the floor. An equal temperature of about 60° F. should be maintained, as far as possible, throughout the house, a free access of air, and, above all, dry. His last rule he would take from the more strict of our Jewish fellow-subjects, that of a complete household-cleansing once a year; the cleansing of every article, great and small; of every wall and floor, door and lintel; and the removal and destruction of all organic refuse, however minute.

A paper on "Health in the Young," by Mr. Edwin Chadwick, C.B., retiring President of the Institute, was read, in the absence of the author through indisposition, by Dr. Parsons Smith. While, said Mr. Chadwick, the reduction in the death-rate of the general population in Croydon by more than one-third, as compared with the rate previously to the introduction of sanitary principles, was a consolation to those who had bestowed labour on their prosecution, the death-rate among children of the wage class was still excessive. He referred to what had been seen a fortnight previously at the North Surrey District Schools at Anerley, where they saw sanitary conditions that had annihilated the great mass of children's diseases. They not expect to introduce at once all the means of prevention they saw at Anerley—such space for children's bedding, such air, skin and clothes and wall cleanliness, such ventilation, such physical exercise, such baths—but much might be done. Amongst most desirable reforms, he suggested the institution of *crèches*, the establishment of a well-appointed infant-school, with the service of an examination of a medical officer of health on alternate days, and the exercise of power on the detection of symptoms of incipient disease.

Professor de Chaumont, F.R.S., followed with a paper on "Health and Good Food," and Professor W. H. Corfield delivered an address on "Mistakes about Health." Dividing life into the Seven Ages enumerated by Shakespeare, he showed that in infancy the chief fallacies were improper feeding and neglect of vaccination; in childhood insufficient clothing; in youth formation of bad habits, especially in irregular action of excretory organs; in manhood marriages between persons of similar temperaments; in middle age excesses at table; and in old age, again, insufficient protection against cold; the few surviving to their dotage were those who had avoided these mistakes.

Mr. G. J. Symons, F.R.S., read a paper on "Pure Water." Did it not, at first sight, he asked, appear remarkable, considering the myriad sources of pollution and contamination which have prevailed since and even long before man came on to the earth, that there should be a drop of pure water left? The two great means by which purity of the world's water supply was renewed was, first, the maintenance of an exact balance of animal and vegetable life, and by all water supply being derived from the clouds. Rain was condensed vapour, but vapour raised from dirty water was clean. The speaker urged the importance of scrupulously guarding against the pollution of water supply, and remarked that purity of the supply in the mains would be of little moment to people if the domestic fittings and arrangements were not what they should be. He condemned the water-butt as a foul, slimy, open receptacle for blacks, leaves, and etceteras which he would not specify, and showed the fallacy of trusting to a filter unless it was frequently cleansed. Taking up the general question of water supply, he said several causes were tending to make pure water increasingly scarce in this country, such as the growth of population and its aggregation in large towns, and the cultivation of moorlands.

There had, moreover, sprung up a rivalry in the promotion of big schemes; and as there was no public department to look after the subject, and decisions were given by Private Bill committees who never had the national bearing of the schemes brought before them, the result was that the rich and the venturesome had it all their own way, and the committees handed over to them in perpetuity stores of water which, under a wiser *régime*, would be duly administered for the benefit of the nation at large.

Dr. Alfred Carpenter gave a lecture on "The Lessons Taught at the Exhibition." The list of articles that had been shown by upwards of 200 exhibitors in the Central Croydon Station might be supposed at first sight to be outside the area of sanitary work; but everything answering the questions of how air was to be kept pure, good water provided, wholesome food procured, and healthy exercise obtained, mental rest ensured, and artificial warmth acquired, came properly within the range of sanitary science. The appliances connected with these and kindred arts were therefore fairly admissible into such an exhibition. The expense which had been incurred by exhibitors told of a demand springing up among the masses for a class of workmanship and a kind of material which should be sanitarily perfect. One great value of exhibitions such as this was, that they brought all sorts of suggestions, all kinds of so-called sanitary patents, to the test of trial by unprejudiced people, and the verdict of public opinion was fairly obtained. They gave inventors an opportunity of seeing other inventions side by side with their own work. This enabled all to judge of competing inventions better than could possibly be effected in any other way: and although every inventor would naturally be biassed in favour of his own invention, yet the people who were, after all, the judges, would pronounce an opinion upon the merits of an invention, and give effect to their judgment by preferring the most useful article. By this means inventors had the weak points in their inventions quickly shown to them, and they might learn lessons which would save them much loss of time, and prevent a needless expense. Although they might outwardly retain their opinions as to the superiority of their own work, they did not waste further time and money, as they might have done if they had not had an opportunity of testing rival plans. Thus both inventors and the public were mutually benefitted by that close scrutiny which all such works receive at the hands of rival manufacturers. The measures, again, taken for the establishment of the exhibition, and still more, the character of the exhibition itself, had brought out into strong prominence the fact that it was to men of science that humanity owed all beneficial progress. Science, and not politics, had improved our arts and perfected our manufactures, had developed every step of progress in lengthening man's life and diminishing the chances and evils of sickness and mortality, had elevated the human race beyond the position it had occupied in the middle ages. Another lesson brought out by the Exhibition had been the provisions that were being made for the protection of the people against the incidences of those diseases which vice, folly, and avarice had brought amongst us. Had it been possible to have held the Exhibition in Croydon ten years ago, the townspeople would most probably have escaped the evils which arose in 1875 from a general want of knowledge upon the proper principles which should guide the householder in his plumbing and house-draining work. It would be a lasting shame if any difficulty were again experienced in Croydon, either in preventing useless waste of water, in making its contamination impossible, or in staying the intrusion of foul air from the sewers into houses. All these results had been shown to be easy of attaintment. No one could examine the works of art submitted by Doulton and by Stiff, by Jennings and by Wilcox, of Leeds, without being struck by the advance which had been made in sanitary work since the days when common earthenware pipes were first laid in Croydon. He would refer to the impervious pipes made of material capable of repair, and which were shown of enormous size. They were far superior to bricks for sewers, and if, as reported, they resisted the chemical influences of sewage, they were invaluable for sewer purposes. He must mention the exhibit of Mr. Lascelles, because he was a Croydon man, and because he had manufactured, out of that which was supposed to be a useless material, a most valuable article, whilst the substance of it was such as would enable those who occupy the buildings which he erected to defy fire, and, what was of much greater importance, to defy the chance of infectious disease becoming a part and parcel of the building. The germs which could be poisonous might be manufactured in the rafters, the floors, and walls of an infected building. Such infection was not possible in Mr. Lascelles' work. He would also mention the numerous methods shown for ventilating buildings, as to which he feared there would, in ordinary houses, be some difficulty if the process were required to be independent of open windows and fireplaces. An advance was being made in the use of gas for cooking and other household purposes, and the exhibition ought to give an impetus to its use in private houses, for gas was cleaner, as safe, and if carefully husbanded, nearly as cheap as house-coal, while it saved labour and waste. There had not been much shown as to sewage utilisation, although, failing sewers, the earth closets were better than cesspools.

Dr. Strong, of Croydon, read a paper on "Health out of Doors," in which he described what had been seen at the North Surrey District Schools at Anerley, and pointed out that, as a rule, not only in pauper schools, but equally amongst the middle and higher classes, sufficient attention was not paid to bodily training and exercise, more especially for girls.

The closing address was given by Dr. Lory Marsh, who described the technical work sought to be carried out by the Sanitary Institute of Great Britain. This he ranged under two heads: the Sanitary Institute had appointed, first, a board of examiners to conduct examinations and to grant certificates in sanitary science to local surveyors and inspectors of nuisances; and secondly, judges to investigate sanitary appliances, to carry out detailed experiments as to their value, and to grant medals and certificates. These functions were sought to be carried out by the formation of a School of Hygiene, at which systematic courses of lectures would be delivered, and by holding annual exhibitions of sanitary apparatus and appliances.

The meeting was closed with the customary votes of thanks to Dr. Richardson for presiding and to the several speakers.

JAPANESE HOUSES AND HOUSE-DRAINAGE.

JAPANESE houses (writes a correspondent of the *American Plumber and Sanitary Engineer*) make no show of architectural beauty, and are extremely plain in the exterior, but the inside is often very pretty and inviting. They are built with reference to keeping cool in summer rather than to keeping warm in winter, and the loose paper windows admit air enough to dilute the fumes from the little charcoal braziers, which are the only heating apparatus. The Japanese are an eminently social people, and their houses are built close together both in city and country, except the farm-houses. The house is generally narrow, and, of course, only the front and rear rooms get direct light, even a corner house generally having no windows of any consequence on its side. Most commonly the house fronts directly on the street, though there is sometimes a small yard with a high fence or wall in front. Unless the front room is used as a store, the front window is secured with a heavy lattice work, so that comparatively light gets in from the front. The only well-lighted room, then, is the rear one, which is the most honourable part of the house, and looks out upon a little yard. This yard is well hemmed in with the adjoining buildings (though this is not so bad where the houses are only a story and a half high), and is planted with trees and shrubs, which give a pretty look to the place, but also are a serious obstruction to the light. This lack of light, which often is very great, naturally produces dampness, and may be one of the reasons why rheumatism and consumption are so common in this land.

The w. c. is always closely connected with the rest of the house, and sometimes a w. c. is put right beside the front door, though this latter arrangement is in the cities confined to the bath-houses. The Japanese understand the use of excrement as manure, and none is allowed to go to waste. Not only are the contents of all private w. c.'s carefully collected, but similar conveniences are placed here and there, at street corners and along the roads. Every morning the people from the surrounding country come into the city with loads of wood, charcoal, rice, or vegetables on their horses' backs, bringing also a pair of empty buckets. When they return from the city the buckets are full, and only a nose is needed to tell what the contents are. During an alarm about the cholera I have noticed that the tops of the buckets—probably by Government orders—are generally covered with dry earth, which keeps the odours mostly in. So generally is the value of this kind of fertiliser recognised, that in a published book of Buddhist sermons an example of covetousness is drawn from two farmers who lived on a road where there was much travel. Each built a w. c. for the public convenience and for the enriching of his own land; and the point of the story turns on the means used by each man to get the travelling public to use his own w. c. This manure is all applied to the fields in a liquid form, the farmer carrying a couple of buckets on a pole over his shoulder, and applying the contents to the young grain or turnips with a dipper. At times of the year when this operation is going on, the odour from the fields is so great that travelling along the country roads is extremely disagreeable, unless one has a nose that is not sensitive; and foreigners who inhabit houses near cultivated fields find it exceedingly annoying at times.

The Japanese do their bathing at public bath-houses, where the same water answers for a multitude of bathers, with great economy of fuel, but with not so good an effect on the health and morals of the people. A great deal of water is, however, used at home in washing the rice as well as in other domestic purposes, the Japanese using water with a lavish hand. There are no sewers of any kind, but the waste water is allowed to run either into shallow cesspools or into the street-gutters. The streets themselves are kept clean, being used by foot passengers, with comparatively very few beasts of burden; but the gutters are apt to be extremely dirty, though, as they are covered, the eye is not offended. The dirty water from these gutters is often used to water the streets, and, once in a while, the gutters are cleaned out. In the time of a cholera scare they are made fragrant with carbolic acid.

The Japanese water-supply comes, in most places, exclusively from wells, each house having one of its own. With the population living so densely crowded together, and with no sewage, this water of course is nearly always impure, but its evil effect may be lessened by the fact that the Japanese seldom drink water except in the form of tea, and, therefore, it is almost always boiled before using. Plumbing is unknown among the Japanese. Only the simplest kinds of tinners' work are done by them. For water-pipes they commonly use the hollow bamboo.

NOXIOUS VAPOURS AND SMOKE.

ON page 293 of the present volume we gave some particulars of a new process for cleansing furnace smoke and preventing noxious vapours. A practical trial of the apparatus, on Thursday week, at Hyde, near Manchester, seems really to have given some results which may lead us to hope that the day is not far distant when our large manufacturing towns may be able to rid themselves of the smoke which at present hangs over them. The contrivance, which is known as Johnson's "Smoke and Fume Washer," was shown at Mr. B. Goodfellow's works. A small working model was first exhibited in action, by Mr. J. F. Goodfellow, who also conducted and explained all the experiments. The model, which illustrated the process, the case being of glass, enabled the visitors to see the purifying operations. These are very simple. The receptacle for the passage of the smoke from the furnace, in its way to the chimney, is intercepted by two or more wooden racks; between these are dash wheels, which, as they revolve rapidly, throw the water from the tank beneath in a fine spray over the racks; the smoke from the furnace is drawn through this chamber by the action of a fan driven at high speed. In the model the liquid consisted of a solution of soda, which so completely absorbed the sulphurous fumes from burning brimstone that it was possible to inhale the air from the exit flue. Equally effective was the apparatus when turpentine, about the most fuliginous of combustibles, was burned; after its smoke had been washed in the little apparatus, a sheet of white paper was not soiled by exposure to the vapour—no longer smoke—of the flue corresponding to the chimney. The fittings for purifying the smoke from the furnaces to two boilers, which use about 50 tons of coal weekly, consist of an oblong trunk of wood made air-tight, and having for its base a tank into which it dips. In this are arranged three wooden racks, through the interstices of which all the products of combustion from the two furnaces must pass. In front of each rack is a dash-wheel dipping a few inches into the water, which, as the wheel spins round, is diffused over the rack and the top and sides of the tank. As the draught is not obtained by exhaustion in a tall heated chimney, it is necessary to produce it mechanically; this is effected by a fan placed at the extremity furthest from the furnaces, with water only in the tank. It is stated that about 80 per cent. of the sulphurous acid is absorbed and all the carbon or soot swept out of the escaping vapour. In the practical tests exhibited last week, the tank contained a mixture of milk of lime. This more completely removed the acids, forming sulphite and sulphate and carbonate of lime, and the sooty material was thrown down with the mud deposited. A striking test of the apparatus in clearing the products of combustion from soot consisted in first placing a piece of wetted linen in the ordinary furnace chimney, when it presented an inky aspect in about half a minute; a similar piece held in the flue from the washing apparatus was scarcely soiled. A vapour appears in considerable quantity from the exit shaft of the washing apparatus, but its effects are dissipated like those of the steam from a locomotive. About two nominal horse-power sufficed to drive the dash-wheels and fan, and the working is pretty nearly automatic. A simple arrangement of Woolf's bottles, containing test solutions, and connected with a meter to measure the quantity of the products of combustion passing through it, and a corresponding arrangement to test the exit air, enables those who have charge of the apparatus to determine accurately the quantity of sulphurous acid in the smoke and the degree in which this has been cleansed of this noxious vapour. The sludge deposited in the tank, which is removed about twice a week or oftener, may probably be used when desiccated as an antiseptic in sanitary appliances, as the large percentage of sulphite of lime it contains fits it for the purpose.

THE SCIENCE AND ART DEPARTMENT.

THE 26th Report of the Science and Art Department of the Committee of Council on Education gives the following summary of results:—"The number of persons who have during the year 1878 attended the schools and classes of science and art in connection with the Department are as follows, viz:—57,230 attending science schools and classes in 1878, as against 55,927 in 1877, and 727,874 receiving instruction in art, showing an increase upon the previous year of more than 19 per cent. At the Royal School of Mines there were 36 regular and 189 occasional students; at the Royal College of Chemistry, 303 students; at the Metallurgical Laboratory, 74. At the Royal College of Science for Ireland there were 22 associate or regular students, and 53 occasional students. The lectures delivered in the Lecture Theatre of the South Kensington Museum were attended by 5,491 persons. The evening lectures to working men at the Royal School of Mines were attended by 1,685 persons, being 458 more than last year; and 169 science teachers attended the special courses of lectures provided for their instruction in the new science schools at South Kensington. The various courses of lectures delivered in connection with the Department in Dublin were attended by about 1,421 persons. The total number of persons, therefore, who received direct instruction as students, or by means of lectures, in connection with the Science and Art Department in 1878 is 794,547, showing an increase as compared with the number in the previous year of 113,180, or more than 16 per cent. The attendance at the Art and Educational Libraries at South Kensington and at the National Library of Ireland in 1878 has been 76,664, or an increase of 1,731 over that of last year. The museums and collections under the superintendence of the Department in London, Dublin, and Edinburgh were last year visited by 2,329,877 persons, showing a decrease of 218,889 on the number in 1877. The returns received of the number of visitors at the local art and industrial exhibitions to which objects were contributed from the South Kensington Museum show an attendance of 513,986. The total number of persons who during the year 1878 attended the different institutions and exhibitions in connection with the Department has been upwards of 3,589,487. This total, compared with that of the previous year, presents a decrease of 672,152. The expenditure of the Department during the financial year 1878-79, exclusive of the vote for the Geological Survey, amounted to £282,553 11s. 5d.

BUILDERS' BENEVOLENT INSTITUTION.

THE thirty-second anniversary festival in aid of the funds of this institution was held at the Freemasons' Tavern, Great Queen-street, on Thursday, the 6th inst., Mr. F. J. Dove, President, in the chair. The Chairman, in proposing the toast of the evening, "Prosperity to the Builders' Benevolent Institution," said that the institution had now been established for thirty-two years, and during that period it had granted pensions to 100 poor men and their wives. All these pensioners had now passed away, but the institution had at present fifty other pensioners on its books. The institution had now an accumulated fund of £20,700, the interest of which sum, supplemented by the donations obtained at the annual dinner and by the annual subscriptions, was appropriated in payment of the pensions. The necessity for such a benevolent institution as that on whose behalf he was pleading, was becoming increasingly felt from year to year. The building trade was one which had for many years been absorbing many trades which, thanks to the spread of sanitary knowledge, had now become essential for the erection of healthy dwellings. Architects now specified the adoption of more or less complicated sanitary appliances, and, accordingly, upon the builder there devolved a great deal of responsibility. Besides this, the risks undertaken by builders in carrying out their works were constantly on the increase: risks of party-walls, risks of adjoining owners, risks of life and limb, risks of settlement, and, in fact, risks of every conceivable kind. The builder had also difficulties in dealing with his workmen, with the building owner, with the architect, and with the district surveyor; and, finally, when he had completed his work, he perhaps had a great deal of difficulty in obtaining the money for it. The last difficulty, added to the others, induced in some men a mental strain which prevented them devoting due energy to their business. The rapid growth of the building trade had been attended with great and sometimes bitter competition, and such competition too often ended in disaster. True it was that many men who had made colossal fortunes in such competition had nobly come forward to help the Builders' Benevolent Institution in providing in some measure for the wants of those who had been unfortunate. The pension granted by the Institution to men was £30 per annum, which was not sufficient to provide for the wants of a man and his wife, but had to be supplemented in many cases by the doles of friends. He thought it would be a grand thing if, by the co-operation of the trade, the amount of the pension could be raised to £50. He felt sure that by a vigorous effort it could be done, and that the committee would be only too happy to increase the pension to £50. Few in that company, however wealthy, knew how long it might be before, by some fortuitous combination of adverse circumstances, they might be overtaken by misfortune and placed in a position to need the help of the Institution. Therefore, he said to all, "While you are in a position to help, lend your help, and that most heartily." Mr. H. G. Smith proposed "The Chairman and President," to which Mr. Dove briefly responded. Mr. T. F. Rider proposed "The Vice Presidents and Trustees," and with the toast he coupled the name of Mr. Freeman, one of the vice presidents, who responded. Mr. Conder, in proposing the next toast, "The Treasurer, George Plucknett, Esq.," regretted that ill-health had prevented the attendance of Mr. Plucknett, who had held the office of treasurer for more than twenty years, and had never previously been absent from the dinner since the foundation of the Institution. Major Brutton, the secretary, announced subscriptions and donations to the amount of £859 0s. 6d. Of this sum £424 15s. 6d. figured on the list of the Chairman, who personally gave £52 10s.; Messrs. Dove Bros. gave £52 10s.; Mr. H. J. Dove, £21; and Miss Dove, £10 10s. The chairman, in proposing the next toast, "The Architects and Surveyors," associated with the former the name of Mr. Francis, joint architect of the Grand Hotel, Charing-cross, and with the latter that of Mr. Franklin. Mr. Francis, in responding, said if the builders on the one hand would keep their day accounts down, and if the architects, on the other hand, would refrain from adopting what was called the "skin-flint" policy, they would continue to get on together very well indeed. Mr. Franklin replied in the name of the surveyors. The remaing toasts were, "The Committee and Stewards," proposed by Mr. Colls, and responded to by Mr. T. G. Smith, and "The Ladies," proposed by Mr. Condor and responded to by Mr. T. F. Rider.

THE LATE MR. WILLIAM FARMER.

MR. WILLIAM FARMER, of the well-known firm of Farmer and Brindley, died suddenly last week after a few days' illness at his residence in the Westminster-bridge-road. We scarcely need to remark that the firm has perhaps the largest business, and enjoys one of the highest reputations as architectural sculptors, and carvers in this country. Mr. William Farmer, the subject of this brief memoir, was apprenticed as a carver to Mr. George Myers, the great builder, and he also assisted in many of the early works of the elder Pugin, indeed, we may observe that his early association with the works of the great Gothic revivalists brought the firm into the deserved repute it has always held. A few of Mr. Farmer's early works in connection with Pugin were at St. Chad's, Birmingham; Cheadle Church, Alton Towers, Beverley Minster; and St. George's, Southwark, in all of which are to be found traces of a true conception of the spirit of Gothic ornament. Afterwards Mr. Farmer moved to London with Mr. Myers, and was soon employed upon a number of important churches, amongst them being Ealing and Gordon-square, which he superintended. After the completion of these works he commenced business on his own account, and was intrusted by various architects of note with the carvings of several important ecclesiastical and other buildings now of historical interest. We may mention works at Bedminster Church, Bristol; Stapleton Church, Carlisle Cathedral, St. Paul's, Dundee; Pepphook House, Dorking; St. Mary's, Stoke Newington, the choirs of Lichfield and Worcester, Kilham Hall, Newark-on-Trent; Preston Town Hall, New Infirmary, and Beckett's Bank, Leeds; Wellington College Chapel, &c. In many of these Mr. Farmer worked under the late Sir Gilbert Scott.

In connection with his surviving partner, Mr. W. Brindley, a still larger proportion of the best ecclesiastical work of the day fell to their share. It would be impossible to recount here all the large buildings in which the firm have been engaged; we therefore content ourselves with a few of the more important of them. Cathedral restoration, under Sir Gilbert Scott, forms a conspicuous portion of their joint labours, and we may particularly name the restoration of the following: the stalls, reredos, pavement, &c., of Gloucester; the stalls, reredos, and organ cases of Worcester Cathedral, and similar works and fittings to the cathedrals of Exeter, Chester, St. David's, Bangor, St. Asaph, Salisbury, Winchester, and Rochester. Those who have seen any of these works, as for example the stalls and screen, of Salisbury and Winchester, can fairly appreciate the skilful workmanship, accuracy, and beauty of detail and carving. In addition to these the firm has now in hand the new stalls for Canterbury Cathedral, which are nearly completed, a work that reflects credit both for its design and execution. The north portals of Westminster Abbey must also be mentioned. The Prince Consort Memorial in Hyde-park, for which the firm executed the carvings; the St. Pancras Hotel and Station; the Foreign, Home, and Colonial Offices, and the Town-halls of Manchester and Bradford are other buildings of note on which Messrs. Farmer and Brindley have been engaged. Of memorials and other recent works, the following important instances may be named; the memorial for Bishop Lonsdale in Lichfield Cathedral; that for Bishop Bucher, Dundee; the recent memorials to Bishop Wilberforce in Winchester, and to Dean Ramsay, Edinburgh. Quite recently, the firm have executed the stalls, &c., for New College, Oxford; the carvings, sculpture, reredos, and stalls for Edinburgh Cathedral, and the new stalls for Canterbury; but one of their finest works is an Egyptian porphyry pavement for the Duke of Westminster at Eaton Hall, for whom they have executed all the carvings in wood and stone, comprising some superb chimney-pieces. We may mention, in concluding this brief list, that Messrs. Farmer and Brindley executed the terra-cotta modellings for the Natural History Museum at Kensington, for which they are now engaged upon some sculpture. We understand the late Mr. Farmer has been unable for some years past to take an active part in the business, and the more recent of the works we have mentioned have been carried out under the personal supervision of Mr. Brindley.

ST. MARK'S, VENICE.

A MEETING of the committee of the Society for the Protection of Ancient Bulidings was held at their rooms was held on Thursday week to consider the proposed total destruction and rebuilding of the west front of St. Mark's, Venice, and to take steps to prevent, if possible, such an act of Vandalism from being perpetrated. Among those present were: — Lord Houghton, Mr. E. J. Poynter, R.A., Mr. Holman Hunt, Mr. A. W. Hunt, Mr. E. Burne Jones, Professor Richmond, Professor Bryce, and Mr. William Morris. Mr. Morris stated that a commission would sit shortly to decide whether the rebuilding of the west front should be begun immediately, or whether it should be allowed to stand over for another twelvemonth. Lord Houghton, Professor Richmond, Professor Bryce, Mr. Poynter, and Mr. Holman Hunt having spoken, it was resolved that a memorial should be framed, to be signed by lovers of art in this country, for presentation to the Minister of Public Works in Italy, praying that the destruction of St. Mark's should not be allowed.

The Society has not been so successful in its work at Southwell and elsewhere at home lately, as to inspire much hope of good attending its efforts on behalf of St. Mark's. If all that is said about the intended rebuilding of that structure is true, it is much to be desired that a remonstrance should be offered by people better qualified to make it than the "lovers of art" who will probably sign the proposed memorial, which is likely to receive about as much attention from the Italian Minister of Public Works as would be vouchsafed by an English Home Secretary to a similar manifestation from French and Italian amateur architects.

We say "if," because we have become so used lately to misrepresentation and exaggeration in connection with similar projects at home, and we should like to hear what the Italian architect in charge of the work objected to has to say for himself, before joining in the testimony Mr. Morris and his followers are so anxious to lift up. If any real Vandalism is apprehended, let Mr. Ruskin speak out. He will know as well as any man what is likely to be lost at St. Mark's, and a few words—spoken as the author of the "Stones of Venice" alone could speak them—would do more good than memorials signed by people, half of whom have probably never seen the city or the cathedral.

HOLMBURY ST. MARY CHURCH.

THURSDAY week was a festival day at Holmbury St. Mary, when the new church erected by the munificence of Mr. George Edmund Street, R.A., which we illustrated in the BUILDING NEWS of September 19th last, was consecrated. The church, dedicated to the Blessed Virgin, is in the Early English style. It has a nave with north and south aisles, chancel with organ chamber on its south side, and a north-west porch. The ground slopes so much that provision is made under the church for two vestries and a room for the sexton. The walls are built of Holmbury-hill stone, with windows and doors, &c., of Bath stone. The south porch and the organ chamber both have stone groined ceilings. From the former entrance is obtained by two doorways to the church, and another doorway opens to a newel staircase, which leads to the belfry. The western bay of the nave is separated by a high screen from the church. Over this bay rises a bell turret, finished with a shingled spire. It contains five bells, arranged for chiming. Entering the nave through the western screen, we find arches on each side, carried on pillars of blue Pennant stone, with smaller shafts of red marble, and, instead of a chancel arch, an open traceried oak screen, surmounted by a cross. On one side of this is the pulpit, which is painted and gilded, and on the other the lectern, which is the gift of the people of the parish, and in the centre a litany stool, the gift of the Rev. Cyril Holland. The chancel has oak stalls for the choir, a very rich pavement of encaustic tiles, with marble steps leading to the altar, which is vested with altar cloths wrought by the Sisterhood of St. Margaret's, East Grinstead, and given by them to the founder. The altar furniture includes a chalice made by Barkentin, altar candles, an altar cross of old Limoges enamel, and also an alms dish and flower vases. On the marble reredos behind the altar is a picture painted by an Italian artist—probably Spinello Aretino—in the 14th century—a group of Scriptural figures with our Lord giving His blessing in the centre, painted in rich colours on a gold ground. The chancel is provided also with carved sedilia and a credence in the south wall. The roofs are all open, showing the timbers, but the oak roof of the chancel is much more elaborate than that of the nave. Almost all the windows are filled with stained glass, all executed by Messrs. Clayton and Bell, from Mr. Street's designs. The font stands at the west end of the south aisle, and has an oak cover. Near it, in a little window at the west end, are the arms of the founder, with the motto of his family, "Fidelis inter perfidos," and under the west window a beautiful old terra cotta of the Virgin and Child, in Luca della Robbia ware, given to the church by Mr. J. R. Clayton. Mr. William Bowman, F.R.S., of Joldwynds, has undertaken the fencing and laying out of the churchyard, and the erection of a suitable oak lych gate at the principal entrance. Other members of his family are giving embroidered hangings for the east wall and the sedilia, the altar desks, and the cassocks for the choir. On the exterior the most unusual features are the considerable height of the east end, and the recessed and canopied tomb for the founder's wife, provided in the lower part of the south wall of the chancel.

The consecration was followed by luncheon at Mr. Street's residence, Holmdale. The chair was taken by Mr. Street, who was supported on his right and left by the Bishop of Winchester and Mrs. Harold Browne and the Bishop of Guildford. The Bishop, in replying to Mr. Street's toast of "Our Diocesan," said he had a most agreeable duty to perform in proposing "The Health of the Chairman," of whose hospitality they had partaken. The good taste of Mr. Street in laying out work, he observed was well known, and he had never seen a more beautiful tent, or one more tastefully arranged than that in which they were then assembled, and in which they had partaken of a most excellent luncheon. They had seen that day good evidence of Mr. Street's skill in architecture and art, and also of his largeheartedness, and he had shown the best possible feeling in presenting that beautiful church. It was greatly to that gentleman's credit that when he fixed upon that neighbourhood for a dwelling house he determined to build a house for God as well as one for himself, and he did not think another such a charming situation, combined with so much architectural beauty, could be found anywhere in England. The whole of the adult population of the new district were entertained, at three o'clock, to dinner, and the proceedings were brought to a close with the lighting of a huge bonfire upon one of the highest hills, which followed close upon an unusually brilliant sunset, and illuminated the district for many miles round.

"A NEW DISCOVERY IN BRICK-MAKING."

IN an article upon "Brickwork," which appeared in No. 1287 (September 5th, 1879) of this journal, our readers no doubt mentally noted the following remark:—"A white brick of a novel character—being made from red clay —will shortly be introduced to the London market from the neighbourhood of the Humber." As the time indicated has now arrived, we purpose to notice this new feature in the great trade of brickmaking.

This discovery is protected by patent, sealed March 5th, 1879, granted in favour of Robert Pickwell, Esq., A.M.I.C.E., of the firm of Clarke and Pickwell, civil engineers, Hull, who was partly led to the discovery of mixing a common ingredient largely found and cheaply obtained in this country with red brick clays, by his chemical experiments upon building materials submitted to the firm by contractors for marine and other works executed under their supervision, and partly by his practical knowledge obtained in the firm's being engaged in brickmaking from the strong warp clays which so largely abound on the banks of the river Humber.

It is a fact that certain brick earths when burnt produce bricks of a red colour, whilst others produce, under the action of fire, bricks of a white or buff colour; but the chemical character of these clays has been little considered, and with the exception of incorporating therewith cretaceous matter, nothing had been done in the way of altering the composition of our various red clays until Mr. Pickwell took the matter in hand. For some years it has been patent to this gentleman that, with the mechanical appliances now brought to bear upon the trade, an attempt to deal with the composition of the brick-earths might reasonably be made, and that the material wanting in the red-brick clays to enable them to fire into white bricks might, in a pure or concentrated form, be readily and cheaply added. This, as experiments upon a variety of red clays proved, required but the intermixture of a common ingredient, the cost of which in a dry state varies with locality, but on the average ranges about 12s. per ton. Its action, we may state, is to flux with the iron so largely present in the red clays, and to render it inoperative in colouring the bricks.

The process of making and burning these patent bricks in no way varies from the ordinary mode; but the intermixture of this dry composition renders clays of a strong character sufficiently dry to work in Matthew's and other brickmaking machines, which is not possible with them in a natural state. The mixing of the clay with this ingredient is the most essential detail, and this is done by an appliance constructed for the purpose, the cost of which is very nominal, and which in most establishments where steam-power is employed would entail but little addition to the existing machinery. Another, and a great advantage, is, that the red clays, which in this case are merely wanted as a basis, do not require to be of that fine quality necessary in making best red bricks, and a commoner class of material, when submitted to this mechanical treatment, will serve to produce best quality white or yellow bricks; and lastly, the fact of the largest and best deposits of clay in the country, which are well known to be red in colour, being placed at the disposal of the makers of white bricks, is an advantage the estimate of which we cannot reach.

The discussion of these details brings us to the following considerations touching our natural deposits of white-brick earth:—This earth is sparingly disposed throughout the country, and it is rarely found incorporated with the requisite amount of bleaching material. If too weak in this composition, the bricks will burn pink in colour, and if too strong they suffer in hardness, and in their bearing qualities, and become tender and rotten in their texture. Where red clays are made the basis, and the mixture is wrought by artificial means, the point of perfection can be easily reached and rigidly maintained. It is a bold assertion to put forward, that artificial brick-earths can be worked with more perfection than natural ones; but, nevertheless, the assertion holds good in the majority of cases.

With the bricks under notice, the questions of durability, persistence of colour, and other details do not arise, if perfect mixture of the bleaching material and burning apart from red bricks are observed, as the material, in its perfected form, is identical in character with the best beds of white-brick earth found throughout the country.

Messrs. Clarke and Pickwell have put down a large plant for the manufacture of these bricks at New Holland, on the southern or Lincolnshire bank of the river Humber, where rail and water communication of the first order exists, and they are now fairly at work manufacturing white bricks from the local warp or red-brick clays, a sample kiln of which was drawn on the 5th inst. in our correspondent's presence. These works are being taken up by the "Patent White Brick Company, Limited," who have bought the exclusive patent-right over an area the radius of which extends sixty miles from the works. In this radius the company holds the exclusive right of granting licenses to work the patent, and the patentee is commencing active operations in connection with the letting of other districts, as our advertising columns indicate.

The patentee has strongly tested his invention in commencing operations on one of the strongest and most ferruginous deposits of clay in the kingdom, and it is clear, if he can successfully produce good white bricks from this material, that his task, in applying his invention to milder and lighter clays, is an easy one.

As to the opening offered for the sale of these bricks in the neighbourhood of the works, it may be noted that the red bricks of local manufacture are vending at 28s. per thousand, whereas white bricks, which have to be brought a considerable distance, are rating at 50s. This disparity of cost, from the extreme rarity of good white brick earth, is by no means peculiar to the Humber district, and this fact goes far to prove the useful character of the invention and to argue its general application.

Such, then, in brief, are the particulars of this new discovery in brickmaking, and from the reports which have reached us we are led to anticipate its general adoption in districts where red brick or inferior white-brick earths exclusively prevail.

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FROM THE BANKS OF THE CLYDE.

THE depression of trade which during the last two years has given rise to so many dismal complaints, and still more dismal predictions, has not affected the building operations of Glasgow so injuriously as might have been apprehended, though it has given a salutary check to the proceedings of speculators. The annual return of the number of houses occupied and unoccupied within the precincts of its jurisdiction, shows a considerable increase in the number of the latter, so that few private houses are now being constructed; but several important public buildings have been in progress, which have sustained the regular course of the building trade. The chief of these is the new Asylum for the Blind, in Castle-street, at the Townhead, so called from the old episcopal mansion, the ruins of which were removed in the last century. The site is that of the former cavalry barracks, which were removed to the south side of the Clyde about the year 1820. The buildings were of red brick, a very neat specimen of what is now called the Queen Anne style, and which really is the domestic style of Holland and North Germany, introduced in the reign of William of Orange, and continued down to that of George III. Since the above time they have been occupied as an asylum for blind persons, the number of whom in Glasgow, as in other large industrial and manufacturing centres, is rather above the average. The new fabric, now nearly completed, so far as regards the part intended for the immediate occupation, is on a much larger scale, built of the best freestone, and designed in the Scottish Baronial style, with lofty crow-stepped and corniced gables, bartisans, and projecting galleries. This style of semi-Gothic is the correlative in point of time and position in art history to the English Tudor style, from which, however, it differs materially both in details and the general effect. Both took their rise in the 15th century, but the Scottish architects followed French and German models in preference. The chief feature of the front is a very beautiful semi-detached hexagonal tower at the south-west angle, with balconies and tablets of armorial bearings. The hexagon is said to be the strongest of figures, and is certainly not inferior to any in picturesque effect; but for some mysterious reason its use has been tabooed by architects in this country, and it will be very difficult to point to another example. The elevation of the structure rises to four stories, and as the site is well calculated to show it to advantage, being the rising ground behind the Cathedral, its appearance is magnificent, especially as viewed from the southern or western approaches. The architect is Mr. W. Landless of this city, who may be congratulated on a building which ranks amongst the finest in Scotland, and will prove a worthy companion to the new Western Infirmary.

Another structure in the same style is the new Municipal Buildings for the suburban borough of Govanhill, which have been erected at the extreme southern point of Glasgow, from the design of Mr. D. Sturrock. Though really quadrangular on the ground plan, it appears to be triangular, from its position at the intersection of cross-roads. The southern front is flanked by a square tower, with round turrets at the angles, and pyramidal roof. The building will be a great ornament to the locality in which it is situated. The Scottish Baronial style was the favourite of the Stuart princes, and some of the best ancient types are to be found in Linlithgow and Stirling. Eyes wearied by the sameness of miles of commonplace streets, find an unspeakable relief in contemplating the varied outline of such fabrics as the above, to which may be added the new St. Enoch's Hotel, at the terminus of the South-Western Railway. The height to which these structures are carried may be judged from the fact that the ridge-line of the roof of the hotel overtops, apparently by some 10ft., the adjoining spire of St. Enoch's Church, which rises 140ft. from the ground.

Of the Palladian or Classical Italian we have even but too much in Glasgow, its predominance here being attributable in a great measure to the long and influential life of the late Mr. Hamilton, a prominent champion of the Classical and, and especially the Greek style, whose letters to the Earl of Aberdeen are probably known to some of your readers. The latest examples are a new club-house in West George-treet, the front of which may compare with that of any similar structure in London, and is remarkable for the elliptical windows of the basement story, a novelty in this style, of striking and by no means inelegant effect; and the Fine Arts Institute in Windsor-place, for schools of art and exhibitions, which is in the broad and massive manner of the Brussels Exchange and the Criterion Theatre in London, with a great display of rich carving and emblematic figures. Comparing the execution of such buildings with the stiff, meagre, and pedantic fabrics raised by the school of Adams and Chambers, it is impossible to doubt that a great advance has been made by our architects in the handling of the Classical style during the last half century. A church in the same style is nearly finished in Infirmary-square, where a great improvement is being effected, by laying down the waste ground in front of the infirmary with turfs and flowering shrubs.

In the Gothic style the only church now in building is a remarkably fine one, for the United Presbyterian body, on the south side of the Western, or Kelvingrove, Park. The architect of this is Mr. R. Baldie, who has judiciously chosen the Second Pointed variety, as most truly embodying the spirit of the Gothic style. The main front presents a grand marigold or rose window, flanked at each angle by an octagonal tower 120ft. high. The side walls are carried up to 40ft., with a range of five windows, which are beautiful examples of Gothic fenestration, and an apsidal ending with an octagonal vestry. In these features the spirit of the style is thoroughly and successfully realised.

The corporate authorities of Glasgow are taking steps to provide themselves with decent lodgings, of which they have been destitute for nearly sixty years past. The old town-hall at the Cross has long been converted into shops and warehouses, and Flaxman's inspired statue of the great minister, than which the whole range of ancient and modern sculpture can show no finer or nobler effigy, is now in safe custody in the Corporation Galleries at the west end. It may be remarked that this statue (for which the artist was paid £2,000 by the Corporation) and Gainsborough's portrait, exhibited in 1867 at South Kensington, are the only adequate artistic memorials we possess of one of the greatest of Englishmen, William Pitt. A sufficient space for the proposed new building has been acquired, consisting of the eastern side of George-square and the block extending for about 100 yards to the west side of George-street. It is announced that the design will be thrown open to public competition, and this is, perhaps, the fairest way of proceeding, though it does not always lead to the selection of the best design, and is attended with the great drawback of causing inevitable and sometimes bitter disappointment to the unsuccessful candidates. It would seem that neither the Gothic nor the Scottish Baronial style would be very appropriate in a square already occupied by Classical buildings, of which the chief are the Merchants' House and the Post-office. But the Jacobean or Renaissance may be chosen without causing too violent a contrast, and it cannot be disputed that this style, when successfully treated, as it has been in the new Town Hall of Leicester, and in several private buildings of this city, offers sufficient scope for variety of outline and ornament in detail to gratify lovers of the picturesque in architecture. The building will be one of cardinal importance, and it is to be hoped may be worthily carried out.

J. H. T.

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PICTURES AND THEIR PURCHASERS.

ON Wednesday evening Mr. J. Thackeray Bunce delivered, at the rooms of the Royal Society of Artists, Birmingham, the third and last of his series of lectures on "Pictures," dealing this time with their Purchasers. The lecturer said that when it was asked, "Who bought pictures?" it might fairly be answered, "Everybody." The army of purchasers, if not as noble as the army of martyrs, was about as large, and was pretty nearly as long-suffering. Purchasers were animated by widely different motives. Some bought pictures because their friends and neighbours did so; some sought for specimens of the old masters, and were systematically deceived; while others who chose the modern school bought cheap and gaudy pictures that were turned out by the score and the hundred as regular articles of manufacture. Many paintings were bought merely as "furniture pictures," used to relieve the nakedness of blank walls, their owners neither knowing nor caring what might be their claims to quality or to genuineness. Another class of purchasers was composed of those who bought out of ostentation. These were the people who, like Dogberry, must have "everything handsome" about them. But there was something indescribably hateful and repulsive in the laying in, so to speak, of a stock of works of Art—like the laying down of so much wine—out of the mere ostentation of wealth, the vulgar determination not to be beaten in anything that money can procure. It was hardly possible that any feeling for art could coexist with such a motive, or could arise from the possession of works so acquired. To such a man these pictures brought no enjoyment of beauty, no refinement of character, no insight in any form of spiritual life. They were costly ornaments which he could have because he could afford them, and which he desired to have, so that he might boast of possessing something his friends and companions could not afford. It was not the love of art; it was the mere lust of possession. Still he did not buy for the mere sake of making a profit. He derived a certain satisfaction at hearing his "collection" spoken of with admiration or with envy; he was not displeased when visitors asked leave to see them, and the chances were that he would lend some of them on occasion for a public purpose. Then there was the speculative class, who bought pictures just as they would buy any kind of merchandise, with no idea but that of the market. Of course, if a man chose to make this his business he had a right to do so, but then he must be honest, and call himself a dealer. Besides these, there were the minor classes of purchasers, with types of which all were familiar. There was the *dilettante* purchaser, who had his own canons of art, and affected only those painters who were obsequious enough to receive his advice or to be thankful for his hints; there were purchasers who bought, not because they cared for pictures, but out of a kindly disposition to give a young man a lift; and there were others who bought because they could not resist the importunities of the artist. There were, again, others who bought a picture because it was pretty, or from some fancy of association, or who could not resist bargains (especially if the canvas was a big one and the frame was massive and well gilt)—or who were tempted to buy something to fill up a vacant place; or, not to dwell upon too many varieties, those who bought because they liked to spend money and to buy something. The lecturer then proceeded to speak of the true picture buyers, those who bought pictures because they loved them. That class, happily for art, was a large and an increasing one. They were not the people who entertained you with notes of prices or estimates of enhanced value. They were not the men who bought only for a name, and never bought until the name was made. Speaking of the picture dealers, Mr. Bunce pointed out that among them were to be found many men of fine taste and true honesty who were friends alike of painter and purchaser, but there were others who engaged in transactions anything but reputable. In conclusion, he replied to the questions, What kind of pictures ought we to buy? In what spirit? From whom ought we to buy them?

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STRENGTH OF AMERICAN TIMBER.

A VERY interesting series of experiments are detailed in a paper read at a meeting of the American Association for Advancement of Science by Prof. R. H. Thurston, and published in the *Journal* of the Franklin Institute. Prof. Thurston, not content with the results arrived at by foreign experimenters, and desiring to arrive independently at the strength of American woods, a knowledge demanded by engineers and architects in the United States, has been making experiments on those woods most generally used in construction. The specimens selected were of sound good stock, and the test pieces were accurately made to the standard shape and size used in the Laboratory of the Stevens Institute of Technology. The specimens were white and yellow (Georgia) pine, locust, black walnut, white ash, white oak, and live oak, and the paper before us describes the growth and conditions of these different woods, about which we need not trouble the reader. The author has thus described the characteristics of good pine timber grown in America. "It has a close grain and its slow growth should be evidenced by the thinness of the annual rings, which should not exceed a tenth of an inch. The trunk, and consequently its rings, should be symmetrical. The best timber is charged with resin, which preserves it from decay, and gives it strength and elasticity; its presence is indicated by strong odour. The colour of the wood should be a clear tint of yellow and red alternating, and the texture as well as the colours should be very uniform. The working of the timber gives a reliable indication of its quality. It should offer considerable resistance to splitting along the grain, it should be strong and free from woolliness, and the cut of the saw and of the plane or chisel should leave smooth surfaces. The shavings and chips should be strong and elastic, and the former capable of being twisted about the fingers without breaking." The above description is very reliable; architects, especially the younger members of the profession, would do well to bear in mind the peculiarities pointed out. First describing the tension and compression machine which is that used at the Stevens Institute, a powerful differential beam combination, the writer observes that the load is applied by means of a hydraulic press, the stress to which the test piece is subjected being measured by means of suspended weights and a sliding poise. The extensions are measured by means of an instrument in which contact is indicated by an electric contact apparatus. The machine employed to test transverse strength was designed by the author and built by Messrs. Fairbanks and Co. It consists of a scale, on the platform of which rests a heavy cast-iron beam, upon which are secured two supports at the required distance apart. Pressure is applied by means of a screw turned by a handwheel, which passes through a cross-nut and terminates in a sliding cross-head which serves both as a guide and a pressure-block. The test piece is laid on mandrels placed upon the supports at the required distance apart. The loads are weighted on a steelyard as usual. For measuring deflections, an accurately cut micrometer screw of steel having a pitch of ·025 of an inch is employed, and to insure great accuracy electric contact is used.

We proceed, however, to give the results of some of the experiments made under the author's directions. We may observe the test pieces for tension were 4in. long and turned to a circular form of ·527in. diameter. The results for white pine show a modulus of rupture of 6877·5, this being the force necessary to pull asunder a bar whose section is one square inch; the modulus of proof stress of the same test piece was 3900; the extension per cent. of length is stated at the total of ·725. The modulus of rupture for yellow pine is 2070·2, that of white ash 15490·5, and white oak 13207·8. The results of tests by compression show for white pine a modulus of rupture of 9592·6 and of proof stress of 5600, the total compression being 3·498 per cent. of length; for yellow pine the figures are modulus of rupture 11952·3, proof stress 7000; for white ash 8148·3 modulus of rupture, and 5180 of proof stress; white oak, the figures are 7143·5 and 5600 respectively. The length of the test pieces were 2·25in. and the diameter about 1·1in., the section being round.

Passing to the tests for transverse strength, the length of the test pieces being 54in. and their breadth and depth each 3in., we have the following results for white pine:—Modulus of rupture (*i.e.* the strain at the instant of rupture upon a part of section most remote from neutral axis), 5280; modulus of proof stress, 4320; modulus of elasticity, 883636; ult. resilience, 1364·8; elastic ditto, 634·8; deflection, 1·28in. ultimate; and ·86in. at elastic limits. For yellow pine the following figures are given for the above respective moduli, 16740, 12720, 3534727, 4174·4, 2039·6, 1·96 and ·84. It is not necessary to go into further detail here, but we can heartily recommend the paper of Prof. Thurston to the attention of all interested in the strength of materials. From the examples we have given of white and yellow pine it will be sufficient to see that the results are higher than those recorded by Barlow, Tredgold and others. The author attributes this fact to the uniform excellence in quality of the specimens tested, although he observes "it is possible they may prove the superiority of the American to the European timber." If we take the figures in tension they are found to be from one eighth to one fourth higher than the specimens given by the above English authorities, though Tredgold's figures for American woods are lower than the results given above, evidence, no doubt, either of difference of quality or of variety of timber. We have not described the torsion apparatus employed, consisting of autographic recording machines. A series of curves or strain diagrams were prepared by Mr. Frank P. Jones, under the author's direction, and are given in "Strength of Woods used in Engineering" in the Library of the Stevens Institute. To Professor Thurston is due the merits of having been one of the foremost American investigators of the subject, and his attention was called to it when engaged in organising the Mechanical Laboratory of the Stevens Institute. It is rather to be regretted that no English Tredgold has appeared on this side of the Atlantic to pursue the inquiry with the appliances and machinery we now possess.

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THE OCEAN PIER, NEW YORK.

THE increasing demand for bathing accommodation at Coney Island, a sand-bar formation forming the eastern boundary of the outer bay of New York, has resulted in the construction of an iron pier of considerable length, the chief peculiarity of which is the use of hollow wrought-iron piles sunk by the aid of the water-jet. This system of pile-sinking is not new, it having been applied to the driving of piles in 1852 at Texas, and in many subsequent erections. James Brownlees used hollow cast-iron piles, with jet forced through pile, in the construction of the Levan and Kent viaducts in this country in 1856, and many recent applications of the process for piers, &c., may be cited, but we content ourselves with giving a few details of the Ocean Pier at Coney Island, as recorded by Mr. Charles Macdouald, C.E., in a paper in the American Society's journal, and referred to by us last week. The pier extends 1,000ft. in a southerly direction, to a point where the depth of water is 16ft. at high tide. At the shore end it is 120ft. wide between the pile centres; thence to the mid-section, a distance of 320ft., the width is 50ft. At the mid-section it is 83ft. wide; from thence to the pier-head the width is 50ft. for a length of 320ft. The pier-head is 100ft. by 140ft. There are two floors, the level of the lower floor being 12ft. above high-water, and the upper floor 24ft. From the views of the structure given in Mr. Macdonald's paper, we find that the pier or platform has three widenings at the shore and pier ends and one in the centre, and subsequently to the erection of the main structure the company determined to erect buildings on the pier, and the designs of Messrs. Gambrill and Ficken, architects, of New York, were accepted. From the elevations given of these buildings, we gather a pretty good idea of the superstructure. The widened portions of the platform show buildings of two stories, and are designed in harmony with the pier itself; the narrower or promenade portion of pier is covered by a roof of one span supported on pillars above the piles, the pier being open at the sides. Relief to this part of the superstructure is obtained by gables and hipped transepts, which break the roof, while the pillars have brackets at the top. The buildings at the ends and centre are half-timbered, and have side verandahs and towers. The shore end building contains on the upper floor-level a restaurant, with kitchen, laundry, and offices below. The mid-section building comprises refreshment-rooms, the promenade being unobstructed. Above are "oriel sleeping apartments," surmounted by a clock tower. The building at the pier-head is intended for a music-hall, with refreshment-rooms at the corners, and a tower at the extreme angles for observation. Altogether the buildings have a light and picturesque appearance that agree well with the substructure. The pier-head is surrounded on three sides by a double row of wooden guard-piles that form a triangular inclosure in front, forming a landing-stage. It is said that the buildings have shown no sign of weakness, notwithstanding the exposed surfaces to the winds they present. Referring to the construction of pier, we may briefly mention that the piles are lap-welded tubes 8⅝in. external diameter and ½in. thick, except at the shore ends, where they are ⅜in. thick. They were combined at the site by couplings 5in. long, to any length, and were treated while hot to a preparation of coal-tar and oil, inside and out, notwithstanding which precaution the coating has already washed off in places. The piles have their upper sections 12ft. long, the couplings being under the castings carrying the lower floor. The distance between the transverse rows of piles is 20ft.: at the shore end there are eight piles in a row, at the midsection six piles, and at the pier-head eight piles. The supporting bases of the piles are of cast iron, 2ft. diameter and 9in. deep; the pile rests in a socket secured by four screws; below is a conical-ribbed projection, through which an opening of 2in. diameter is left for the water-jet. In the operation of sinking the piles, the jet was applied through a pipe 1½in. diameter, extending down the pile and disc, and about 2in. beyond. The pipe was held firmly at the pile-head, and connected with the pump by a rubber hose. Thus the water pressure was transmitted directly to the sand at the foot of pile, transforming the soil into a semi-liquid mass, through which the pile settled to the required depth. The wrought-iron beams of the lower floor are laid lengthwise, and are secured to castings clamped round the piles by ⅞in. bolts. These beams are 15in. deep. Transversely, they are connected at each row of piles by 6in. beams with angle-iron lugs, which are bolted through the webs of main beams. The capitals to piles are of cast iron, secured by four set screws, and fitted to receive the wrought-iron beams described. To resist the effect of wind on the buildings in the centre and pier-head, a system of vertical bracing in both directions is introduced, consisting of 1¼in. rods connected to the piles by cast-iron rings held in place by tap bolts and horizontal struts attached to the same points made of two 6in. channel bars latticed in the form of a] [section. The timber flooring is of 12in. by 3in. Georgia pine joists placed 2ft. apart, upon which are planks 6in. by 3in. Mr. Macdonald's paper describes in detail the pile and pumping apparatus, scaffolding, and travelling derrick used in suspending and driving the leading piles at every row. During part of the time, work was carried on by two electric-lamps from the Dynamo-Electric Light Company, of Newark, N.J. The works were executed by the Delaware Bridge Company, under the supervision of Messrs. Maclay and Davies, engineers to the Ocean Navigation and Pier Company. The main interest possessed by the pier at Coney Island, however, is due to the superstructure we have described.

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The parish church of Gunnersbury was reopened on Sunday week, after restoration carried out by Messrs. Adamson and Sons, at a cost of about £950.

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ILLUSTRATIONS.

THE YORK STAIRS WATER-GATE.—CAPITALS AT ST. DENIS, NEAR PARIS, BY VIOLLET-LE-DUC.—NEW R.C. CHURCH AT CASTLEISLAND, CO. KERRY.—HOUSE AT WILLEY'S-AT-HEATH, KENT.—SILVER MEDAL DESIGNS FOR DAIRY HOMESTEADS.

OUR LITHOGRAPHIC ILLUSTRATIONS.

YORK STAIRS WATER-GATE.

The Metropolitan Board of Works have at last turned their attention to the deplorable condition of York Stairs, or Buckingham Gate, as it is sometimes called, now half buried in the newly-made slopes of the Embankment-gardens. We publish to-day a drawing, by Mr. Robert W. Gibson, from that by which he obtained the Royal Academy medal for perspective in 1876. This was prepared from existing drawings corrected by measurements and sketches of the building itself. The mouldings, however, being in some exposed parts decayed and weatherworn, were taken from the most reliable of the older drawings. The former position and purpose of the gate will be seen from the view. According to some records it was designed and erected by Inigo Jones, about the year 1626, for George Villiers, first Duke of Buckingham, one of the embellishments he added to his newly-acquired palace. Formerly this had been a residence of the Bishops of Norwich; it was granted by James the First to his favourite in the last year of his reign. There seems to be some doubt as to the authorship of the gate, however; in the later editions of Gwilt's "Encyclopædia" it is "now considered to be by N. Stone." The Villiers arms and motto—"Fidei Coticula Crux"—occupy prominent positions; the former over the centre opening on the south front, and the latter upon the frieze of the back or northern face. This last view is much less agreeable than the more important one. Designed to face with its best aspect the fashionable highway of its day—the river, the building became almost forgotten when that time passed away, until the Embankment again brought the public to its proper front. It is undoubtedly a relic well worth preserving on account of its artistic merits, independent of the historic interest attached to it. We wait with interest to learn the intentions of the Metropolitan Board of Works with regard to its "restoration." It is to be hoped better judgment will be exercised by that practical body than has been the case in some similar instances. There can be little question that to allow it to retain its original site must be the best plan. Under some circumstances it might be desirable that such a structure should follow the retreated river margin; but the lines of the modern Embankment, however beautiful in themselves, would be utterly discordant with the old-style water-gate. And again, the river is no longer the highway from which the majority of people view our public buildings. The structure is sound and stable, and probably the plan suggested by Mr. Gibson is the best and cheapest practicable, viz., to raise the building bodily to a favourable level and underpin it upon its old platform and foundations, without any work to the superstructure beyond the few absolutely necessary repairs. The platform and steps (or at least some of them) should be reconstructed; they are an important part of the design. It does not seem desirable or necessary to have recourse to pulling down and numbering of stones, a method costly in proportion to its destructiveness, even if it be thought necessary to slightly alter the position of the building. We are glad to see that something is to be done. As we pointed out in a former number, it is quite time the neglected ornament was reinstated to a position of the dignity it deserves.

CAPS, CHURCH OF ST. DENIS, NEAR PARIS.

Last week we gave an illustration of the signs of the Zodiac for the Cathedral of Carcassonne, from the autograph drawings of the architect, M. E. Viollet-le-Duc. To-day we have devoted one of our lithographic pages to the illustration of a series of caps for the new church of St. Denis, near Paris, which was built by Viollet-le-Duc about 1873. The sketches are shown simply as the author drew them, because in this form they may be more suggestive than if completed and drawn in a more finished way. These, indeed, are simply the architect's autograph working sketches given by him to the carvers to work from, and as such they cannot fail therefore to be of interest and value to our readers. Illustrations of St. Denis figure in Baudot's Eglises de Bourgs et. Villages.

CASTLEISLAND R.C. CHURCH, CO. KERRY.

This design was selected in a competition wherein seven architects competed. The church consists of nave, N. and S. aisles, transepts, chancel, flanked by two side chapels, vestries, &c.; a nuns' choir is shown at the south-east angle of building to be in connection with existing convent, and divided from south chapel by an ornamental wrought-iron grill. An organ chamber is provided in south transept for use of nuns, access to which is gained from nuns' choir by a stone spiral staircase. The nave arcade will be supported on Shap golden grey polished granite, with carved Portland stone caps and moulded bases. The responds in south chapels and small columns in angles of apse will be in Aberdeen red polished granite. The exterior will be built in a local limestone, hammered, dressed, and dressings chiselled. All interior dressings will be of Bath stone, with exception of caps and bases to columns of nave arcade. Tenders are now being invited for the erection of church, and it is expected the building will be commenced in September. The cost is £8,000. The architect is Mr. Dominic J. Corkley, 59, Oakley-road, London, N.

WILLEY'S-AT-HEATH, KENT.

This is a small house, picturesquely situated on one of the hills overlooking the valley of the Hever, on which great care has been bestowed to render it substantial in construction and complete in detail. The materials are of red brick and Howley Park stone, built in Portland cement, with Kentish tiles on the upper story, the framing of the gables, the sashes, floors and staircase being of oak. The work has been carefully executed by Mr. Richard Durtnell, of Brasted, from the designs of Mr. John Robinson, of London.

SILVER MEDAL DAIRY-FARM PLANS.

Good plans of farm buildings are very seldom to be found in books of reference, so that we have from time to time endeavoured to supply the want by giving particulars of the kind whenever an example worthy of being taken as a model comes before us. With this idea we publish to day the two chief prize designs from the late Dairy Show at the Agricultural Hall, Islington, on which occasion we reviewed at length the whole series of plans for farms submitted in competition. The first silver medal was awarded to Mr. H. Wilkinson Moore, architect, of Beaumont-street, Oxford, for the design marked "In Toto," to which the estimates by the author were £2,076 for the homestead with covered yards, and £1,276 for the house and offices. If open yards, as per the small bird's-eye sketch, were accepted as a modified arrangement, £1,750 was the estimated outlay for the farm buildings. These prices are said to be based upon the actual cost of similar buildings already executed. The walls were shown to be of brick, and the roofs covered with slates. The roofs to covered yards are intended to be of timber, same as all roofs throughout. The arrangement of the several departments is clearly shown on the plan, assisted by the general bird's-eye view. The extra or duplicate silver medal awarded by the judges was given to the design marked "Shorthorn," and this we also illustrate to-day. The architect is Mr. Richard Waite, of Duffield, near Derby, and as this design was not shown when we saw the remainder, a few particulars furnished by the author as descriptive of his design may not be out of place. This design is intended for a dairy of 80 cows, and provides 58 cow-stalls; the remainder would be lodged in the divisions of the covered yards, or be dried off for calving—in the event of more than 58 being in milk at one time, the excess number could be admitted into the stalls from the yards by relays at milking time. The stalls for each pair of cows are 7ft. 6in. in width, which the author has found to be ample in all cases. The feeding-troughs are of purpose-made blue bricks, with a galvanised iron self-filling water-trough between each pair, provided with a hinged lid, all opened or closed at will by connection with a wrought-iron pipe shaft worked by a wheel and worm. The stalls are separated from the feeding gangways by posts and horizontal rails. The tram-rails laid at the back of cows next the covered yards are intended for the double purpose of conveying food to the covered yards, and for the removal of manure from the stalls to a covered manure pit in the stackyard. As a general rule, the manure from the stalls would be conveyed direct into the covered yards (from which they are separated by dwarf walls) there to be trampled and consolidated, but when straw is scarce, it is found necessary to remove a considerable portion of this manure from the stalls to a covered pit; for this purpose, tram-waggons effect a great saving in labour. The rails may be almost or quite flush with the paving, and are not found to impede the passage of cattle. The covered yards are 37ft. 6in. clear between the walls, roofed over with queen-post trusses in one span. Ventilation is provided along the whole length of the eaves, by the entrance archways, and by louvres on the ridge. The floors are of concrete, raking downwards, 2ft. 6in. from entrance to centre, with a fall of one in nine. The boxes for calves, young stock, bulls, and hospitals, are placed on the east side, with access from the external road and from the feeding gangways. The piggeries and boiling-house (all under cover) are on the west side, having communicating doors to the roads and to the covered yard; swing doors are provided over the pig troughs, rendering them available for pigs in the styes, or running loose in the yards; the breeding stye has projecting rails round to protect young pigs from overlaying. The food-preparing department is in the centre of the block on the north front, adjoining the stockyard. In the mixing-room is a brick-built steaming closet, supplied from the engine, also a grist mill; the chaff-cutting is done on the floor above. The pulping room for roots adjoins the mixing-room; the floor space above may be thrown open to the upper part of a straw barn, or set apart for a granary and corn store. The straw barn is shown 24ft. by 18ft., carried up the height of two floors; an inner door is shown next gangway, so that straw may be loaded direct on the tram-waggons and taken to all parts of the buildings; the segmental recesses next gangway are only carried up sufficiently high to permit tram-waggons to be turned. The author has endeavoured to so arrange the plan that all the parts shall be suitable in position and area for the purposes intended, thereby securing the maximum accommodation in the minimum space; the construction is substantial, ready means of ingress and egress are provided throughout; all doors to places intended for live-stock open outwards, and are hung in rebated reveals to hook stones; door frames have been carefully avoided, as they so quickly rot at the bottom when in contact with manure. All projecting angles of bricks are rounded. The position of the liquid manure tank must naturally depend upon the levels of the site. The dwelling-house, which provides the usual accommodation, is placed south of the farm buildings, the windows of the living-room and kitchen overlook a considerable portion of the buildings.

WILLEY'S-AT-HEATH, KENT.

JOHN ROBINSON ARCHITECT

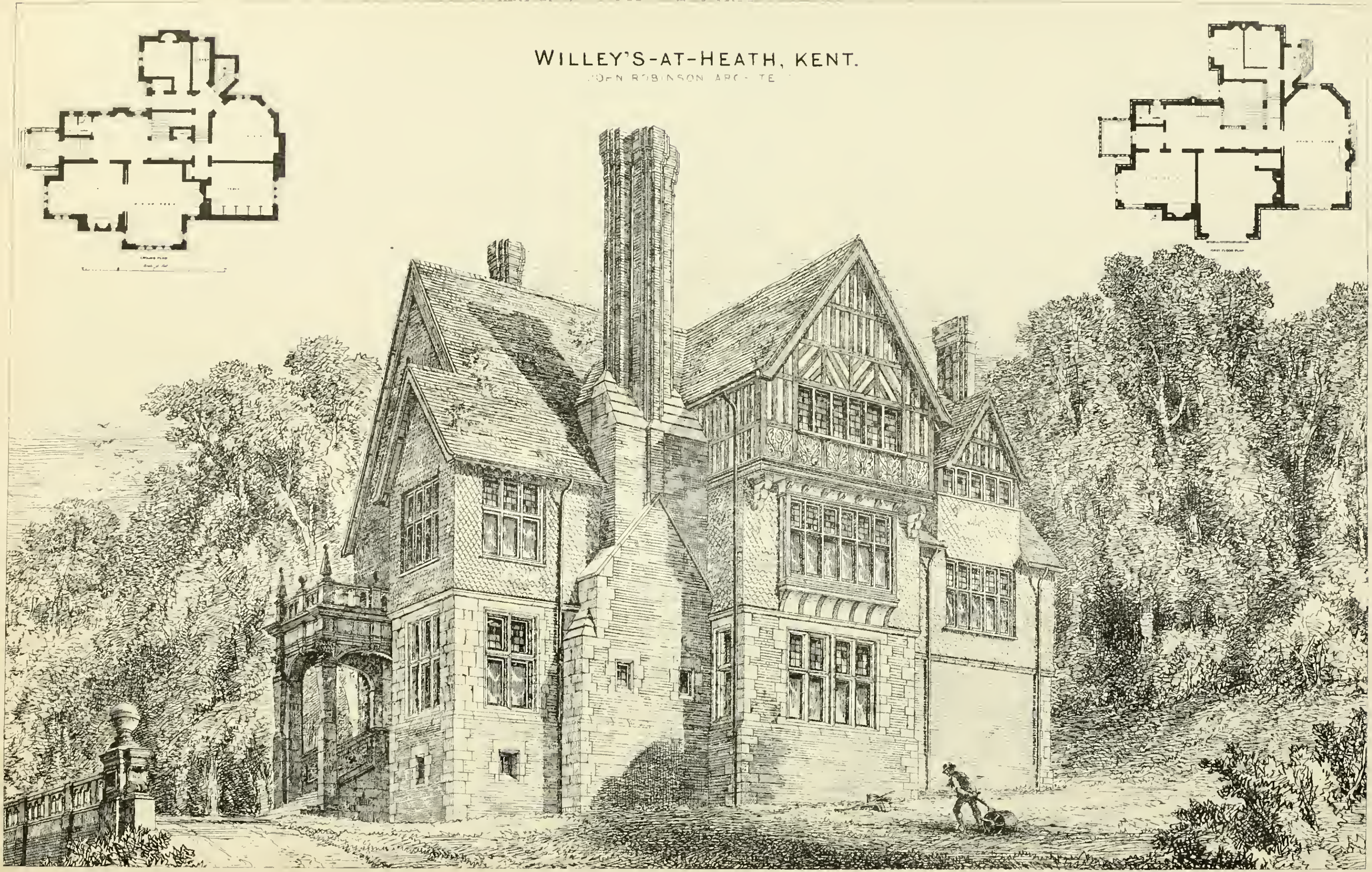
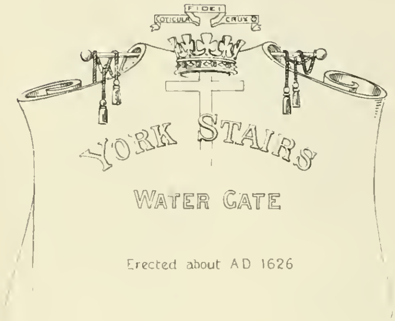
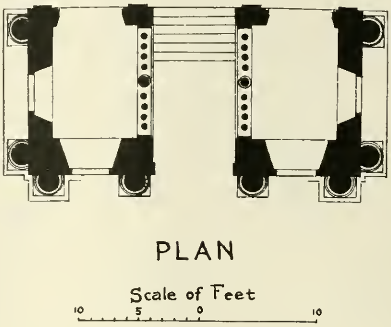
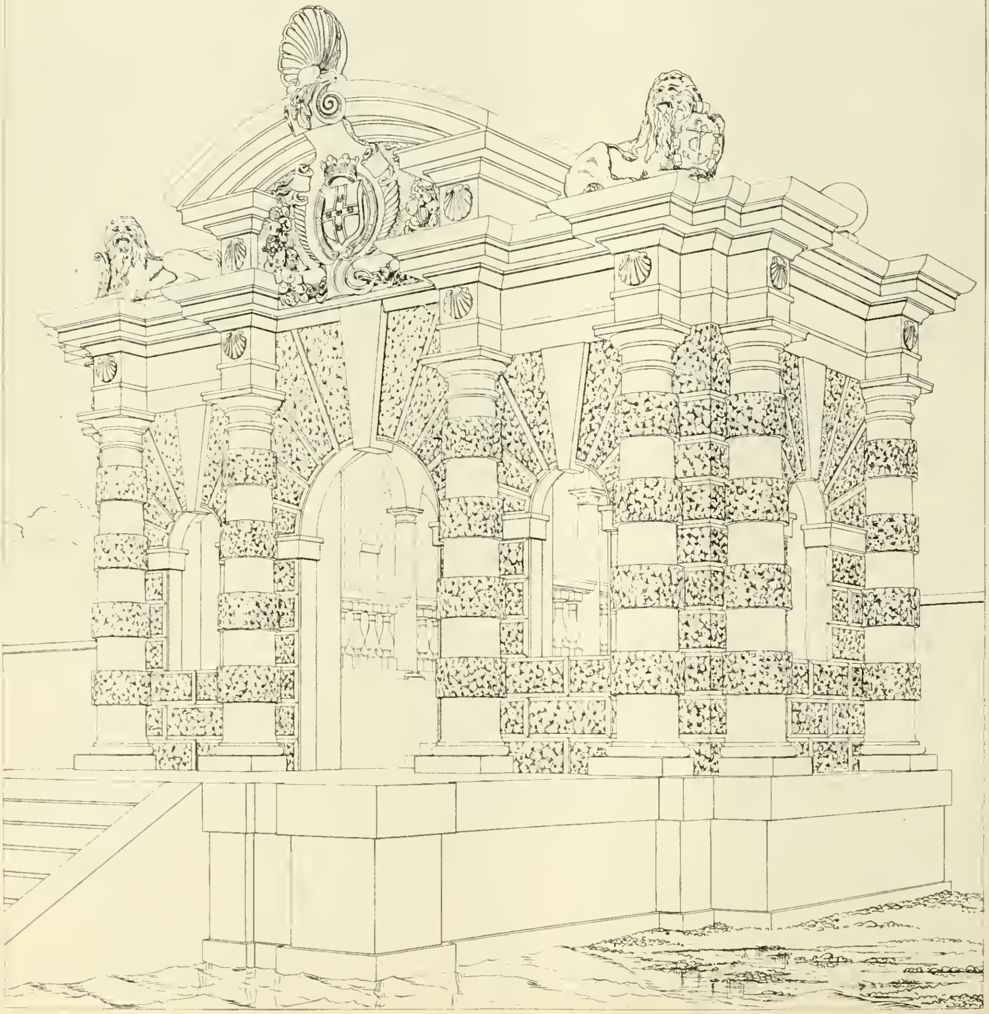


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

ROYAL ACADEMY SILVER MEDAL (PERSPECTIVE & SCIOGRAPHY) 1876, BY ROBERT W. GIBSON.







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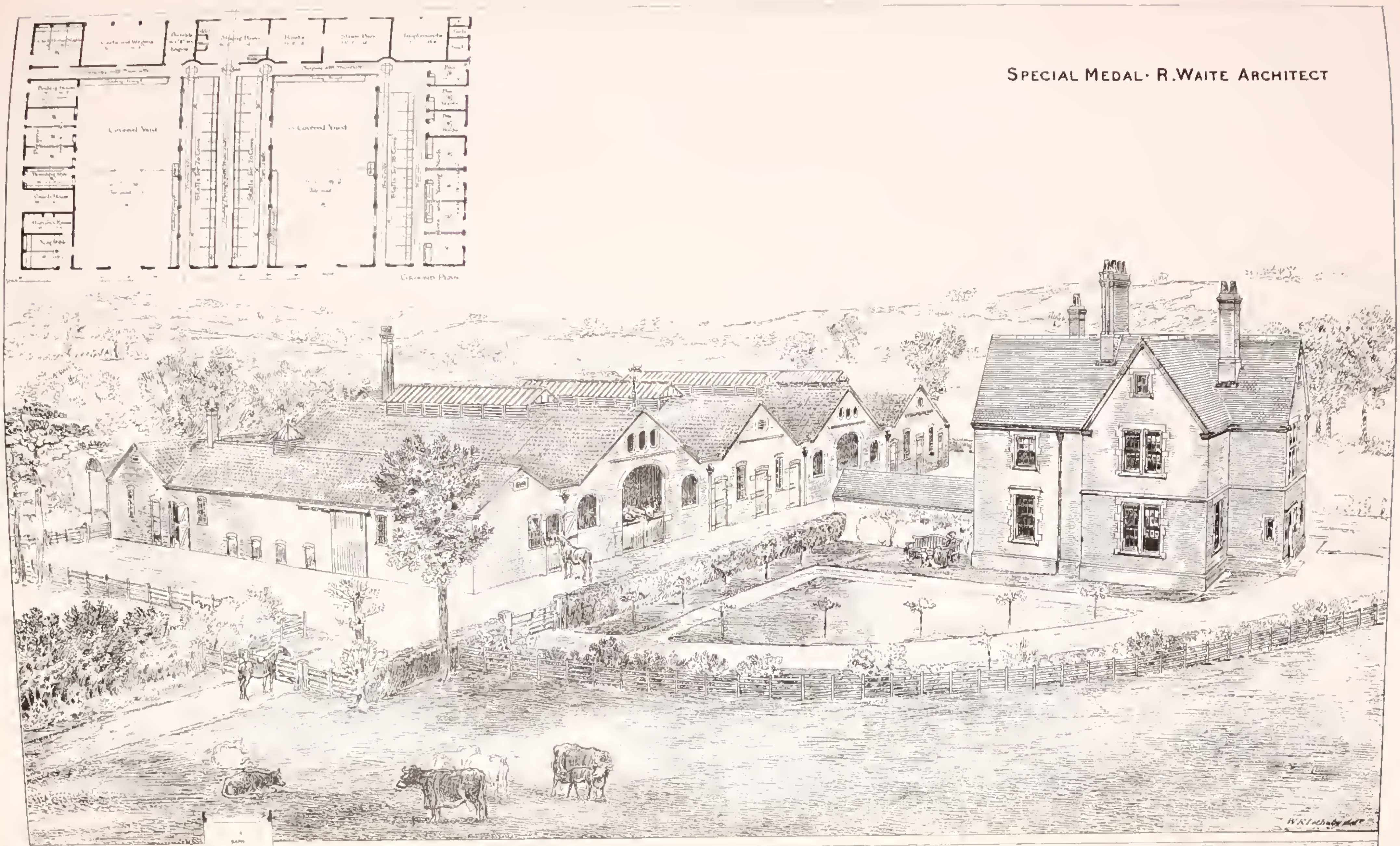
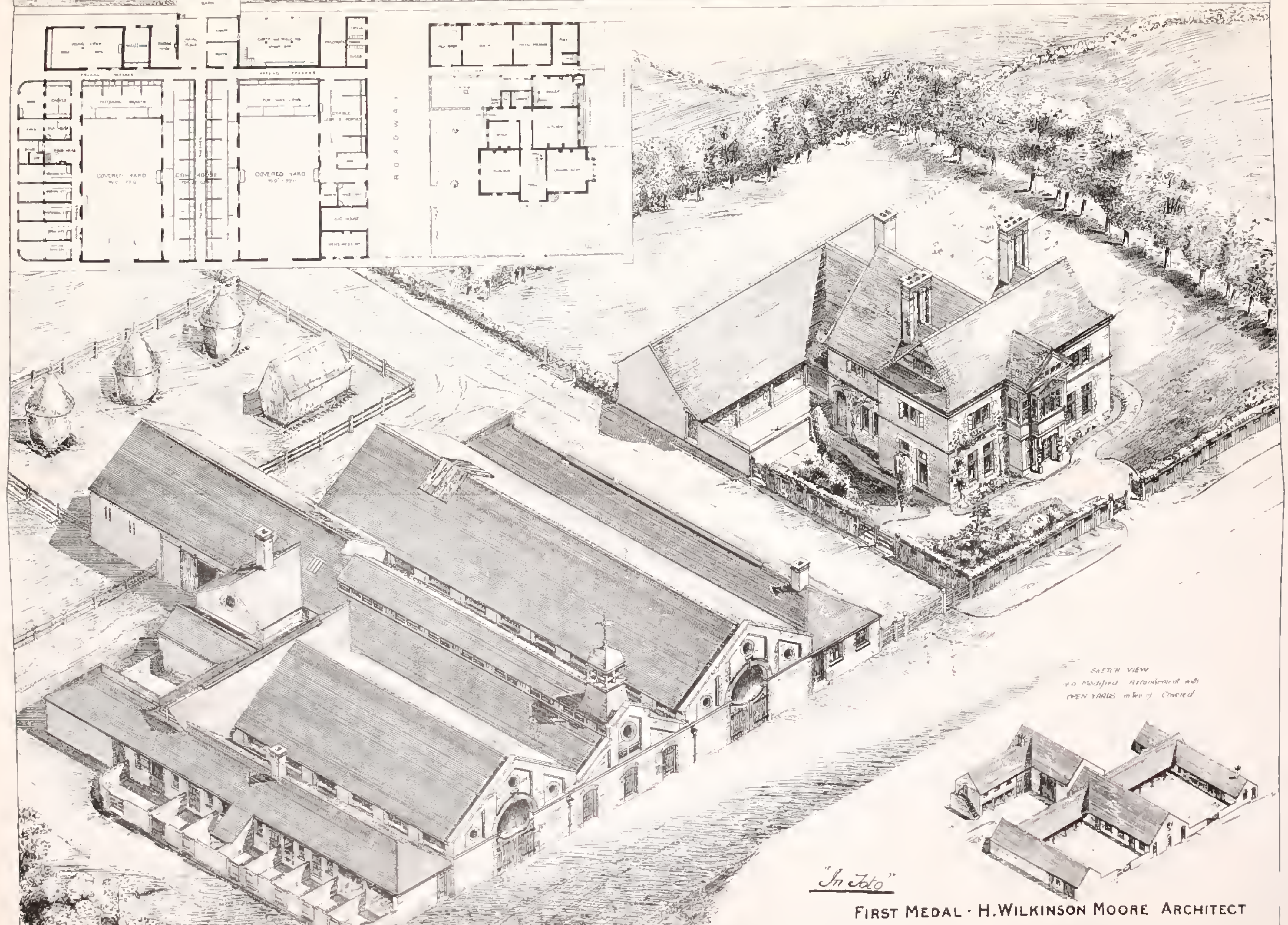


SPECIAL MEDAL · R. WAITE ARCHITECT

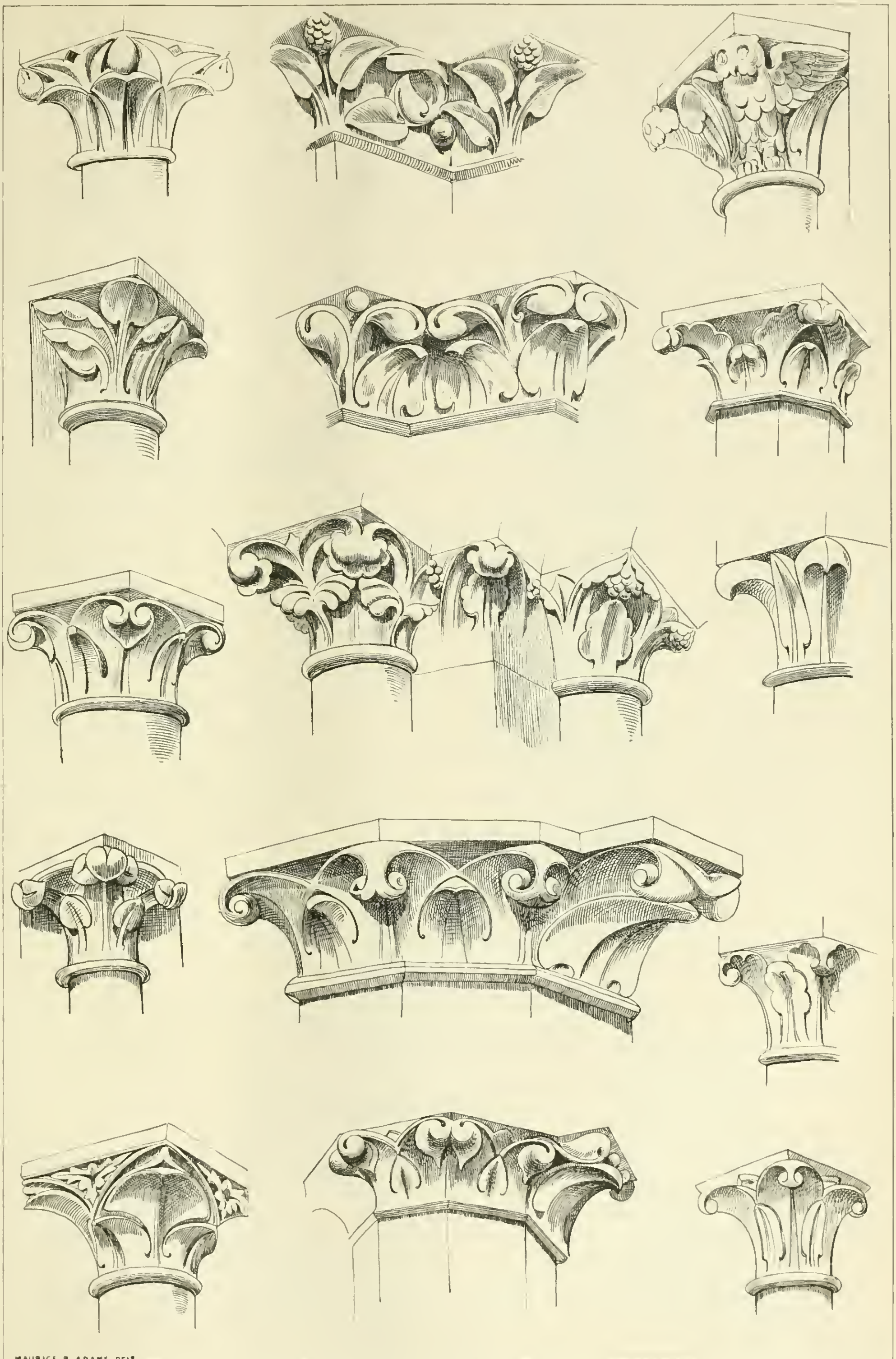


"In Toto"

FIRST MEDAL · H. WILKINSON MOORE ARCHITECT

Photo Lithographed & Printed by James Akerman, 6 Queen Square W.C.

DAIRY SHOW 1879 HOMESTEAD FOR 80 COWS SILVER MEDAL DESIGNS



MAURICE B ADAMS DEL^T

SKETCHES FOR CAPS IN THE NEW CHURCH OF S. DENIS NEAR PARIS. M. VIOLET LE DUC, ARCHT:

FROM THE AUTHOR'S AUTOGRAPH STUDIES

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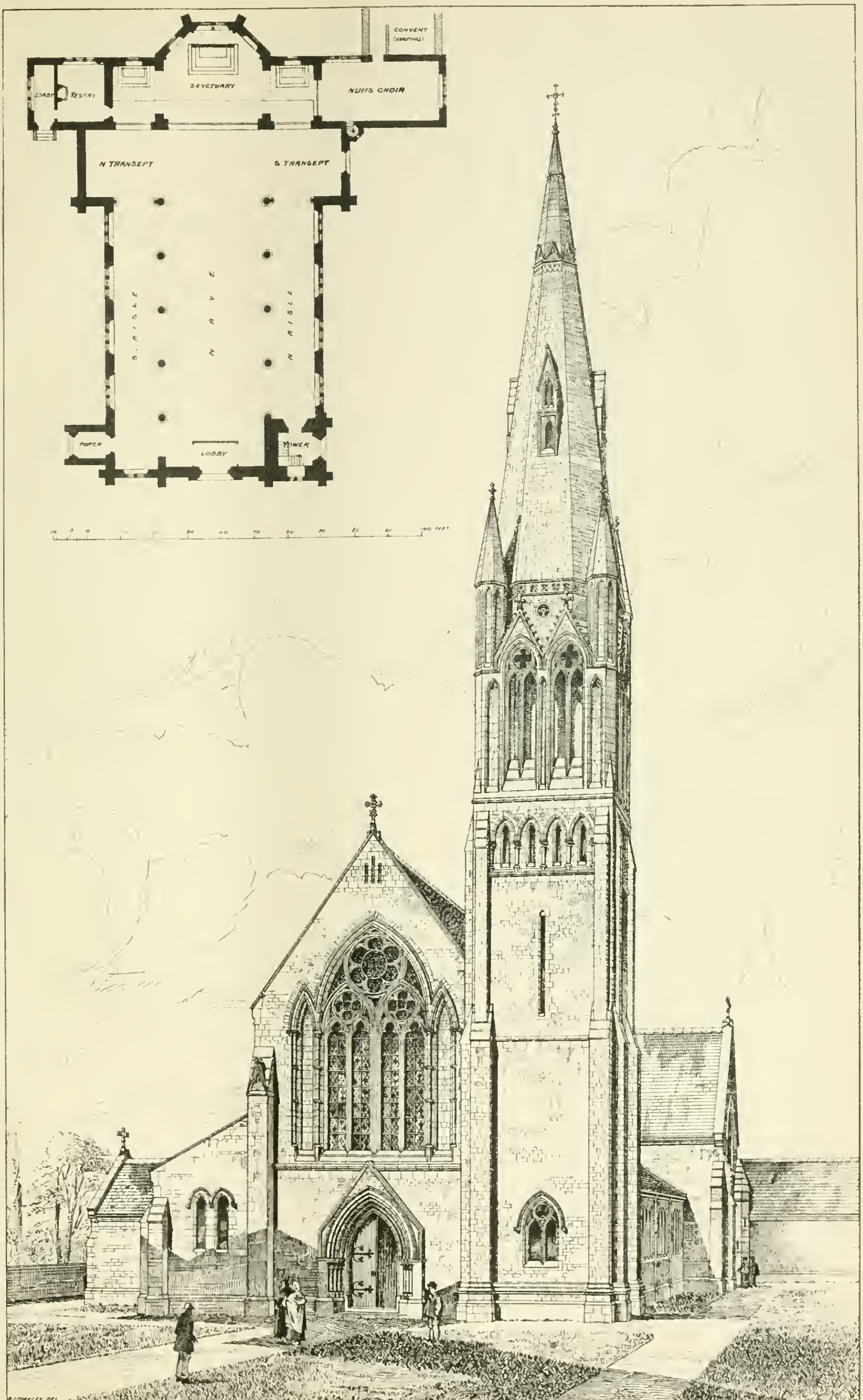

PROPOSED NEW R.C CHURCH. CASTLEISLAND. Co. KERRY. DOMINIC. J. CORKLEY. ARCHITECT.

THE "BUILDING NEWS" DESIGNING CLUB.

DESIGNS FOR A COFFEE TAVERN, &C.

AN overwhelming number of designs have reached us for this, the first subject of our new series of competitions, and we are therefore compelled to notice only a very small number of the designs; indeed, it would be quite impossible to do more than enumerate in catalogue fashion many of the drawings that have been received. We think it best, therefore, to arrange the whole of them into three classes, only criticising in detail a few of the first. We may remark that although we have not received one design that realises the intention we had in view, there are in all three classes instances of skill and draughtsmanship, as well as misdirected labour, that afford room for the reflection that these competitions are doing good, if only in the way of directing the efforts of the young aspirant. The design signed "Edwin" we have put first, not however because we think it a model, but because it approaches the kind of building we had in view. The plan has certainly less to commend it than some others: we are at a loss to see the utility or artistic charm of the entrance passage which leads to the billiard-room; the doorway as placed is awkward and meaningless; it would have been better in the front or arranged to enter a lobby at the side. The billiard-room, 23ft. by 17ft., is well placed at the side; the bar and coffee-room, the kitchen and offices are tolerably convenient, and the reading-room over the billiard-room is reached by a convenient stairs, with small cloak-room and w.c. on one side of the landing. The kitchen is roofed over on the first-floor, but we do not see the chimney stack on the first-floor plan. The author has adopted the style of old English inns, characteristic of the country, and the details and treatment are thoroughly redolent of the style of Mr. Norman Shaw. We cannot, however, praise the entrance, which is not bold enough, nor the coved balconies of the billiard-room windows, nor the circular windows of reading-room; and a larger bar window also might have been introduced in keeping with the style chosen. "Jack" is the motto of a design of much picturesque vigour and piquancy, but the drawings are spoilt by the confused manner in which the plans are printed, which are almost unreadable. The main street front shows a general bar entrance and wide window, and a coffee-room at the corner, with rounded angle window. The bar is 22ft. by 18ft. 6in.—too large, and if the coffee-room had been of these dimensions, it would have been more consistent with the intention of the building. A side entrance porch is placed on the return side, but the w.c., lobby, and yard are exceedingly cramped. The kitchen is at the back, and the general arrangement of offices is compact. We do not like the staircase access to the reading and billiard-rooms, and those who wished to play billiards or read would have to pass through the general bar; the landing is also contracted. The billiard-room is over the general bar, and is 24ft. 6in. by 18ft., partly bracketed over the lower story in front. The style chosen is Queen Anne, treated with considerable freedom. The ground-story is proposed to be of red brick, the upper portion pargetting with brick mullions, and tile hanging in projecting gable of billiard-room. An advantage of the plan is that on one side there is a blank wall, no light being necessary. The author works out his design at 6½d., coming out at £1,495. "Castello" is a design in Late half-timbered Gothic, very carefully and correctly drawn, with good details, but wanting in the character of a public-house. The entrance at the corner is not conspicuous enough; there is nothing to distinguish it or the side windows from those of a private house. The upper story is of timber-framing and plaster-work, with mullioned windows. The faults of the plan are indirect entrance to bar and a too small coffee-room; the kitchen and private entrance, the billiard and reading-rooms up stairs are fairly arranged with good access, landing, and conveniences. The cubing is priced at 7½d. = £1,400. "Sub Rosa" is suitable in style and treatment; a half-timbered upper story with gable and side windows to entrance, marks the bar and reading-room above, but the coffee-room on plan is only 12ft. 6in. by 11ft.—much too small—while the bar might have been made of less size. The billiard-room, 24ft. by 18ft., is at the side roofed low and entered from a separate hall. The kitchen and offices are not very economically grouped. The cost is computed at about £1,300. An alternative design, No. 2, we like better in elevation and plan, and the tile-hung upper story is cheaper. The plan has a side entrance to the billiard-room, and the coffee-room is turned round, but is still too small. On the whole, however, the arrangement is convenient. This design is cubed out at 9d. = £1,263 19s. 10½d., or £1,264 all but three halfpence—we prefer the round numbers. The design "Sub Silentio" has one good feature in elevation—it is the bar window and entrance, which looks what it is intended for. This part of the elevation has, however, been sacrificed by being tacked on to a front of very nondescript kind, with small narrow windows, whose detail is intended to be in the fashionable brick style. The gabled termination over the reading-room and the parapet are the least satisfactory parts. In plan the author shows a fairly arranged interior, but the coffee-room is rather larger than necessary, and there is no separate entrance to the reading and billiard rooms, which are well placed in front and are amply lighted. The cost is worked out at £1,500, cubed at 7d. "Nineteenth Century" rather belies its motto in the style chosen, which is 17th-century, handled with some freedom and effect, gabled bays and balconies being the main features of the elevations. Turning to the plan, we find an unnecessary space has been given to a centre bar, the billiard-room being on one side, and the coffee-room, one-story high, on the other, making a very wide frontage. There is a private side-entrance to the reading-room on the first floor. The offices are arranged in a very confused manner. Why place them round a small open yard? and could they not have been planned in half the space? Economy has not, at least, been consulted in planning. The materials are red brick and grey stock, with wooden bay-windows, and plastering in parts. The woodwork to be painted white. The wide bays and entrances are expressive and suitable. "Alonzo the Brave" sends a half-brick and timbered building, of some picturesqueness, but the parts are not happily grouped in elevation, and the corner entrance is rather out of keeping with the upper portion. The author places his reading-room on the ground-floor, access to it being obtained by a glazed passage on one side of the bar. This arrangement, and the passage to the open yard, are not happy. The billiard-room is over the bar, and a coffee-room above the reading-room, and both are well-lighted, the former by dormers, on three sides. The kitchen and private rooms and offices are self-contained, on one side of the bar, and an open yard, with side-passageway, occupies the inner angle of site. "By 'Arry" is distinguished for features of a decidedly Jacobean character; the front elevation has an arched recessed lobby-entrance, leading into a bar 35ft. by 20ft.—certainly too large. On the right-hand side is a one-storied billiard-room, top-lighted, with a separate entrance, and stairs to coffee and reading-rooms above. The plan is well-arranged, and a large yard, with conveniences, is planned to occupy the internal corner of the site. The hatchway for serving the billiard-room from the bar, and the position of bar-parlour, are handy points. In external design, we prefer the front to the side; on the whole, the composition has a very stilted effect. The attendants' rooms in the roof would have been better-placed on the first story. Carefully-drawn elevations accompany this design. "Honey Dew" shows a compact arrangement, with a front coffee-room 23ft. by 18ft., and corner entrance, a kitchen behind, and side stairs to billiard and reading-room over. The coffee-room and bar together is economical, and saves room. A lift is provided near the counter, and the conveniences are complete. We do not like the wide arch over the flat bay of the coffee-room, nor the upper treatment of elevation. It is, however, commendably drawn, and generally suitable in style. "Domestic" is more fit for a cottage or villa residence; the coffee-room and bar hardly betoken the purpose of the house in the way they are arranged, and the entrance is rather quiet. The billiard-room and smoking-room are well planned in connection with stairs, but the lighting is imperfect. Generally, the planning of offices might be improved. The external style is suitable. Author cubes at 9d. —£1,481 9s. 6d. "H." is the motto of a design in which we cannot fail to notice that the author has placed under contribution bits of both Mr. Norman Shaw's and Mr. E. W. Godwin's works. We point to the bay window with balcony railing, and the parapet, along half the front elevation; but in both instances the details have been cribbed without obvious purpose. For instance, of what use is a balcony without means of entering it? and we certainly cannot see why a heavy parapet was introduced on one side only, nor the quaintness or beauty of the bit below the left-hand pilaster of tower. The doors and windows to the other portion of front are strangely out of keeping. The plan is much better, and the back kitchen and offices conveniently arranged for serving visitors. There is also a separate entrance to reading and billiard-room upstairs. "Perseverantia" goes to unnecessary trouble in spending three sheets of drawings over what must be pronounced to be an ill-digested arrangement. It would not be difficult for persons to enter the reading-room and take papers away unknown to the attendant; the entrance to coffee-room is not near enough to the front doorway, and the urinals and lavatories are undesirably placed. The break in front spoils the plan, which would have been better adapted for a private house. The elevations are certainly more suitable; the upper timbered story is plain, but effective, and a little ingenuity of planning might have been spent with advantage. "Clansman" disposes his bar and news-room lengthwise, making a wider frontage than necessary; the bar is too large, and the coffee-room too small; the entrance to billiard-room through bar is inconvenient, and the stairs and landing cramped. There is, nevertheless, indications of merit in the elevations, though the details are poor, the entrances especially. In another group we place "F. in Circles," "C. in Circle," "M. A. A. in Triangle," "North," "Such a Dog;" "Toledo," "Wasp," "North West," "W. F. in Lozenge," "R. in Square," "Tim," "Am I?" Generally, they fall into the mistake of adapting domestic arrangements, and in showing extravagant features, although there are good points in some of them which it would be impossible to detail here. For instance, there are a few good features in the elevation of "F in circle," such as the bar entrance, though the plan is straggling. "Wasp" also gives a pleasing timbered building with a very compact and clever plan for a narrow frontage, but some of the detail is expensive, and the roofing awkward. The cubing is worked out at 8d. a foot = £1,350. "North West" is pleasing in its front elevation, and the arrangement is not bad in the serving part, but we find fault with the treatment of billiard-room. "North" has made a pleasing and characteristic feature of his bar window, but the arrangement is uneconomical. "Such a Dog" has too large a bar, and a rather small coffee-room, while the billiard-room entrance through the bar, and the stairs approach to reading-room, are equally faulty arrangements. Elevations are suitable in style. "Toledo" falls into similar mistakes, and shows a waste of passage-room and defective entrances, besides poor serving facilities. "W. F." has taken the type of an ordinary dwelling-house in the entrance and stairs arrangement; the reading and coffee-rooms are small, and the billiard-room 10ft. too long. "Tim" is a vigorously-conceived design with many good features, but the kitchen is scarcely near enough to the bar, and the billiard-room hardly lighted enough. Two good entrances are provided. "R. in Square" is too much of an Italian villa in elevation, the facilities for serving the bar and coffee-room are hardly equal to the case, and the billiard-room is too square. "Am I?" fails in the convenience of bar facilities and the offices are soo dispersed. "C. in Circle" is decidedly extravagant in style, and the plan is not concentrated enough for economical working. The estimate is too low. "M. A. A." follows the ordinary villa plan, the bar is too far from the kitchen, and the offices, reading, and billiard-room are ill-planned: the latter is much longer than necessary. The cubing is low. "Qui Vult Valet" is planned on similar principle: the bar, coffee-room, and kitchen are ill disposed. "J. C. in Circle," cleverly drawn in elevation in florid Queen Anne spirit, is expensive, and the bar and kitchen arrangements are faulty. The bar windows are too much like shop windows. "Mente Manuque" makes a feature of his public billiard-room, but the bar is too large. The entrances and stairs are cleverly managed, and the Late Gothic treatment is suitable for a small town. "G." shows some quaint window design to the lower rooms, but we do not like the ugly cutting back of the recessed entrance; the roofing is also poor, and the plan very indifferent. "F in Circle" is a more costly treatment in an Old English style, but the entrances and planning generally wasteful. "Ora et Labora" is a bold-treated half-timbered building, but rather domestic in character; the plan is not well contrived in the offices. "Yes or No" is characteristic of an old town inn; the half-timbered gable is simply managed, and there are a few good points in the plan which fails in the service arrangements. "Vanity Fair" is a plain domestic structure, with good points. The entrance-bar and coffee-room are conveniently disposed, but we do not like approach to billiard-room. In "Burswell," the best feature is the external doorway, and the plain brick elevation and windows; the plan with the kitchen and scullery on the first-floor is a remarkable inversion of order. In "Resurgam" we see an old hand. This time his work is scarcely so successful. The bar and coffee-room are not very conveniently placed for serving by the lift from the attic floor, and the arrangement is scarcely adapted for a small house. The front elevation is spoilt by the curved pediment over the bar entrance. Timber and rough cast is shown for the upper story. The cubing is at 10d. "Franc Tireur" is in the same style, but the planning of the entrance passages and kitchen offices is below par. Quite as bad for convenient service is "Try Again," a one-storied building having all the chief apartments on the ground-floor. "Fleur de Lis" has a pleasing elevation well grouped, but the plan is awkwardly contrived for convenience. Why should the bar and kitchen be placed on opposite sides of hall? "Ogmore" has something picturesque in his elevation, and a sensible recessed porch with balcony over; but the plan is hardly up to the mark, though it is better than many in this class. "Mot" is wasteful in the passages, and the bar and kitchen are too far asunder. "No. 90" has a good coffee-room and entrances, but the stair-flight is awkwardly long, and the details of design are hardly up to the mark.

In a third class we place a large number of designs in which the conditions have been exceeded or misinterpreted. As it is quite impossible to notice all of them, however briefly, we will enumerate the mottoes. "E in Circle," "Tace," "Stone," "Intersecting Circles," "Our Praises, &c.," "B in Circle," "Pendennis," "Heart and Arrow," "Quis," "Excelsior," "H," "Ivanhoe," "Osian," "Queen Anne," "Quod," "Ars," "Minor" (put your drawings on one sheet), "Gwent" (the corner studs of your gable angles only show on one face), "Nomme" (too cut up), "Streonshalh," "B. N.," "G. Toltec," "Figaro," "Ormond," "Attempt," "Pupil J.," "Rusticus," "Sub Judice," "T.," "O. U.," (too like a vestry-hall), "Lancaster," "A. U. C. in Triangle," "Excelsior," "Timeo," "B in Three Circles," "East Anglia" (ought to do better), "J. H. S ," Peter," "Rosebud," "Fidessa," "Beltshazzar," "Dalgarno," "P in Quatrefoil," "Cham," "E in a Square," "Minor," "Gwyndwr," "Anteverta" (more like a factory), "Adaliquid," "N.B.," "Peter," "Greyhound," and "Nota Bene."

CLOCK AND HALL TABLE.

"Honey Dew" has seized the idea for these subjects. The hall table stands on six turned legs framed together in the upper part by curved brackets. It is in simple Jacobean spirit. The top curved ornament and row of balusters are in keeping with the style. The clock is effectively framed, and is crowned by the old-fashioned broken pediment on turned corner balusters. All the details are good. We place "Binny" second. The hall table is open in front, with a covered top supported on corner turned balusters. The carved panels and details are cleverly drawn and in keeping with the Renaissance style. Below is a shelf for ornamental basins. The clock front design is exceedingly quiet and characteristic of the style chosen; the dial is cleverly relieved by carved band and by small fluted pilasters carrying an entablature and pediment over, an eagle on globe filling up the centre space. The lower part of clock front is quite plain, and there is a pleasing breadth of treatment in the design. Design with Circle is also clever; in the clock front the style is Gothicesque in spirit, but moderate in detail. We do not like the side framing so well. The table is light, simply framed, with rack for hats above; oak without varnish; and chamfered mouldings, and oxidised silver hinges, with a dial of blue and white china are intended. The design by "James in Circle" is of quiet Jacobean character, but we do not admire the centre framing over the table. In a far different spirit is "Mediocria Firma." The hall table is Elizabethan, has a deep scolloped pattern carved along the edge with a massively arcaded lower shelf for china; glass, or stamped leather panels are shown at the back. The clock is Elizabethan; the front is cut up into panels, and the dial and details are carefully drawn. "Null Bien san Peine" is another design in the same style; the top part of table is heavy and out of keeping with the lighter treatment of the legs in a Louis Quinze style. The clock front is relieved by Ionic pilasters fluted and diagonal panel. The details are carefully drawn. "Con Amore." The table is heavily designed in the turned legs and upper part. The clock is shown on a bracket above, in a well-designed case, but the two objects do not harmonise satisfactorily. Details of mouldings are good. T. Square is an elaborately-drawn design in a Renaissance style; the table has an open front adorned by panelled pilasters for bric-a-brac; above the top is a bracket supporting a timepiece. The latter has a good outline, but the table top and frieze is too heavy, and the ornament poor and meagre. "Burswell" sends a plain table with turned legs; the detail and mouldings are coarse. The clock case is simple, and might have been made more effective if the top with the corner consoles were taken off. "Black and White" is overdone in the carved panels; the table legs are disproportionately large, and the details, especially the terminal and broken mouldings in the centre, are meaningless. The clock case is spoilt by the heavily-carved panels, and the broken mouldings round the dial. The labour in drawing the sections might have been well saved, as they are too small, and the members, like the carved ornament to the bottom of table legs, purposeless. "Our Praises are our Wages" is a better conception; the outlines and proportions of the clock face and the dial are simple and effective, but we cannot speak so well of the table. "Such a Dog" has a clock in Late Gothic; the hall table is plain, though scarcely equal to its purpose. "Duncan Macallister," "Ogmore," "Presto," and "Hangling," are designs in which ornament has been introduced without effectiveness, while the detail is below par.

OUR COMMONPLACE COLUMN.

IVY.

FAIRHOLT tells us that "this plant was used as symbol of eternal life, from its remaining continually green. A wreath of ivy constituted the prize of a victor in the Isthmian games. The mediæval painters prepared a red pigment from the juice or gum which in warm countries flows from the ivy in the month of March." In the *Ecclesiologist*, 1847, p. 159, we find the following interesting remarks by the editor: "We can well imagine any admirer of Gray's 'Elegy' lamenting that the 'ivy-mantled tower' should no longer answer to its familiar description. Still we must, as ecclesiologists be allowed to enter our protests against ivy. It is doubtless, in its own place, very beautiful. It gives new life to the dead tree, and curling down the blue limestone rock, and mingling with the dark-green of the yew and the lighter tints of the deciduous shrubs, affords a beautiful contrast; and finally, on a dead wall it is invaluable. But its beauty is dangerous: its roots penetrate the mortar and dislodge the stones; it breeds damp, and it ends with totally concealing the beauty which it is supposed to heighten. We confess we never see any mantled abbey without wishing we had power to strip away the *parasite*. Why should it be *there?* Anybody can at his will command ivy (?), but he cannot command the delicate details of such First or Middle-Pointed work. It is, therefore, a sort of wastefulness, to say no more, to let the former destroy the latter." This plant is not, however, a *parasite* like the mistletoe; on the contrary, it possesses roots of its own—the rootlets or fibres which gave rise to the belief in its being a parasite are merely supports. [In decorative art the ivy-leaf is a favourite form, and has been much employed by the Mediæval artist.] C. F. W.

JAPANNING.

THIS process has, of course, received its name from the islands of Japan, from whence articles so varnished were first brought to Europe. Articles such as cabinets, work-tables, and works boxes, fire-screens and tea-trays, tea-caddie-and bread-baskets, are those which are most sought after, and will be found to be really works of art—Japanese art has, of late, been revived in this country, in many instances. The material for japanning consists of copal varnish or anime, and (according to the colour required or intended for the ground), mixed with different substances. After receiving a coat of this mixture, the articles are placed in an oven till perfectly dry. The process of applying the copal and anime varnish and the drying in the oven is repeated several times in articles of a better and more important kind, in order that a good ground may be insured and obtained. When thoroughly dry, after the last application, they are painted and gilded as required, when they are then ready for the "finishing." This process consists in the choosing and passing over the surface a suitable varnish until such a thick coat is given as to bear the "polishing." It is of the greatest importance that before applying a second coat, the first coat of varnish should be thoroughly dry. When the varnish has "coated" thick enough, the "polishing" may commence. This is done by rubbing over the surface a rag dipped in very finely-powdered tripoli or rottenstone. When the operation is nearly completed a little oil is added to the rag, and dipped into the powder; later on, oil alone must be used to clear off any remaining powder. Interesting works on this subject are "Keramic Art of Japan," by G. Audsley, London, 1875; "History and Description of Japan," Chas. H. Eden, London, 1877. J. A.

JESSE, TREE OF.

FAIRHOLT, in his "Dictionary of Terms in Art," says:—"In Christian art, the genealogy of our Lord was a subject often selected by the mediæval artists for representation, either in stained glass, sculpture, painting, or embroidery. The idea of treating our Lord's genealogy under the semblance of a vine arose most probably from the passage in Isaiah. Jesse is usually represented recumbent. The mystic vine (the emblem of spiritual fruitfulness) springs from his loins, and, spreading in luxuriant foliage, bears on distinct stems the various royal and other persons mentioned in St. Matthew, chap. i., among which the kings David and Solomon occupy a distinguished position. Those before the Babylonian captivity are represented as kings, afterwards as patriarchs. The name of each is usually inscribed on a label, entwined in the vine close to the figure designated; near the summit is the Virgin Mary in glory, with our Lord in her arms; but the stem does not extend to Him, on account of His Divine incarnation. There are examples of the vine terminating in a cross, with our Lord crucified. This manner of representing the genealogy of our Lord, of which there are examples even of the twelfth century, was very common from the thirteenth to the fourteenth, both in stained glass, illuminations of manuscripts and printed 'hours,' stone and wooden sculpture, and embroidery. Its effect, as sometimes executed, must have been most glorious, the vine running in luxuriant branches, with a stem and tendrils of gold, thick with green foliage and purple grapes, disposed so as to sustain and surround a long succession of royal personages, with rich crowns, robes, and sceptres, holding labels and illuminated scrolls, and terminating with our Lord in the arms of His mother, radiant with splendour, and surrounded by angels." Mr. Parker tells us in the Glossary that, "At Dorchester Church, Oxfordshire, it is curiously formed in the stonework of one of the chancel windows; at Christchurch, Hants, and in the chapel of All Soul's College, Oxford, it is cut in stone on the reredos of the altar. It was likewise wrought into branched candlestick, thence called a Jesse, not an unusual piece of furniture in ancient churches." M. V. le Duc (*Dict. Rais.*, art. "Jesse") enumerates a tree of Jesse, being sculptured over the central door of Amiens cathedral, one above the central doorway of Laon Cathedral, belonging to the 13th century; one of the 16th century at Chartres. A stained-glass window with this subject depicted on it is to be seen in the Virgin's Chapel in the Abbey Church of Saint Denis. They are also to be found—belonging to the 13th century—in the cathedrals of Rheims, Amiens, and Bourges, and at the Ste. Chapel of the Palais. One of the most remarkable stained-glass windows in France belonging to the 16th century is to be seen in one of the apsidal chapels of the church of St. Etienne de Beauvais. This "tree" may also be seen in the cathedrals of Sens and Autuns in windows belonging to the 16th century. A short time ago a "tree of Jesse" was to be seen at the corner of a house (not an uncommon position for it) in the Rue de St. Denis, at Paris. See De Caumont's "Archit. Relig.," pp. 473, 717 (Ed. 1867). C. F. W.

JUBE.

THE roodloft, or gallery over the entrance to the choir is called in France, and sometimes in England, the Jube, from the words *Jube Domino, Benedicere*, which were pronounced from it immediately before certain lessons in the Roman Catholic service (Parker). See under word "Roodloft" *infra*.

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LINTHORPE ART POTTERY.

ON Tuesday last an extensive exhibition was held at the warehouse of Messrs. Dresser and Holme, in the Farringdon-road, of specimens of the new art pottery which has just been introduced from Linthorpe, near Middlesborough. Anything fresh in the way of art pottery worthy of the name, at once commends itself to architects and our readers generally, even although no strictly architectural ornamentation may have been made of the material under notice. With reference to the "Linthorpe" ware, such an application, it seems, has not been thought of as yet, the manufacture hitherto being confined to vases, flower-pots, chimney-piece ornaments, and table furniture. With regard to the display of these on the occasion above referred to, we have only an approving remark to make, for it is evident that the Linthorpe red brick clay ware will take a place with Doulton and Wedgwood pottery. Mr. Tooth is the artist to whom most of the designs already produced are due: he has worked, however, under the direction of Dr. Dresser, who, in conjunction with Mr. Harrison, of Darlington, started the manufacture about a year ago.

The wares of Linthorpe are of three kinds. First, an undecorated ware, which pretends to good forms and colours. Of plain vases we noticed about 150 shapes, but several of these shapes appeared in different colours. Thus, a vase of the double (or pilgrim) gourd shape was in a fine orange-red colour: in a low-toned yellow; in a red-brown, and in yellow, green, and brown mottles, such as in some cases have a resemblance with onyx or agate. Second, there is a ware which is enriched with incised ornament, and which, in the case of several specimens, is also perforated. In this ware the decorated objects are covered with parti-coloured glazes, and some specimens are decorated with conventionally-treated flowers and leafage, the outline of which is scratched in the clay, while the forms thus outlined are coloured in a subdued manner. Of this ware there are many fine examples, such as are eminently appropriate as the ornaments of chimney pieces, cabinets, and sideboards. The third kind of ware consists of pieces which are enriched with bold painting in enamel colours of flowers and birds, but of this ware only few specimens were shown, though many, we learn, are now in process of manufacture. Few of the pieces have garish or fussy effect. The idea of the new pottery is that of producing a ware which shall be at the same time highly artistic and inexpensive. In price, the prices run from about two shillings in the plain wares, to £5, or even more, in the case of large and elaborate specimens, but a pair of vases of good form and charming colour can be had for about ten shillings. A few very quaint ideas have been carried into effect, based on Japanese models, such as the "Cat Vase," and figures of men inclosed, all but head and hands, in oddly-shaped vessels, and in these the leading characteristics of clay ware have been well adhered to.

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ST. PAUL'S ECCLESIOLOGICAL SOCIETY.

THE second session of this society was pleasantly inaugurated on Wednesday evening by a conversazione at the Chapter House, St. Paul's Churchyard. A very large number of members and visitors were brought together, and in the course of the evening Canon Gregory delivered a characteristic address, in which he gave all a hearty welcome. The society was founded, he said, as the result of a conversation he had with Mr. Howard Wall, now the secretary, who remarked to him that a want would be supplied if the young men of London could visit the churches of the metropolis under efficient guidance on their Saturday half-holidays. The society was organised, the dean and chapter willingly placed their house at the disposal of the members, and he congratulated them, after an eleven months' existence, on the success the movement had attained—a success chiefly due, he felt, to the kind manner in which the architects of London had come forward to deliver lectures to the members, or to conduct them over churches. The knowledge of our ecclesiastical architecture was not alone desirable in itself, but greatly aided in illustrating English history. Prebendary Irons followed, and dwelt upon the ennobling and purifying influence of Art—a term in which he would include the branches of sculpture and architecture with that of painting. The study of these subjects was compatible with that of the highest theme, and filled the mind with thoughts of purity, grace, and truth.

During the evening an interesting exhibition of ecclesiastical art was on view in the rooms, and the examination of these, to the accompaniment of part songs and solos by members, assisted in rendering the evening a success. We noted a varied display of embroidery, worked by the sisters of St. Margaret's School of Ecclesiastical Embroidery of East Grinstead, at St. Katharine's, 32, Queen-square, W.C. Amongst these was an altar-cloth in dark-hued wools, copes and frontals of silk richly braided with coloured needlework and gold and silver tissue, and antependia. From the same school was sent a pyx of cedar-wood, inlaid with thin veneers of delicate fret-carving in the same material; these enframed panels of the substructure, upon which saints' figures were painted in low tones. The inscription stated that the exhibit was "carved and painted by a lady," but did not add if the artist originated the design. Mr. Edward Tattersall exhibited embroidery of a more rich and heavy character, including devices in tissue of the precious metals worked upon red velvet panels. A large number of rubbings from brasses hung upon the walls, the most conspicuous being a series of foreign examples of considerably larger dimensions than those in our own churches, lent by Major Heales, F.S.A. Of these the principal was an impression from a double brass at Lübeck, measuring rather more than 13ft. by 6ft., representing Burchaud de Serken, 1317, and John de Mül, 1350, bishops of Lübeck, who are depicted in full episcopal robes, standing under richly-cusped canopies; the surface of the brass is completely covered with an architectural composition, including a series of saints' figures under crocketed canopies. The painstaking manner in which each minute detail of dress is delineated, as well as the style of the architectural accessories, distinctly point to a Flemish origin, the character of the composition much resembling that of the well-known "Peacock Feast" and Walsoken brasses in St. Margaret's, Lynn. Indeed, the backgrounds to some of the minor figures are filled with representations of brickwork laid in alternating headers and stretchers, in Flemish bond—a detail of decoration scarcely seen except on brasses of Flanders workmanship. Another brass was from Cracow, representing Frederick, Cardinal and Prince Bishop, 1503, and engraven in broader and bolder lines than that just described. A third showed the effigy of Bertrand, Bishop of Paderborn, and was interesting as being a simple effigy without background, of the English type, but with the Continental defect of having the folds of the vestments cut after and through the figured patterns, with which they are ornamented. Of quite a different character was a figure of a Spanish grandee, in doublet and hose, from the tomb of Don Perafa de Ribera, Duke of Alcala, 1571, from Seville. Of English brasses, we noted a large impression of a prior from Cowfold, Sussex, the Seymour and other brasses from the chancel of Higham Ferrars, and others from Cambridge. A large number of photographs were shown, including many of English, French, and Italian cathedrals, and views of Old London by the Society which has charged itself with the perpetuation of "picturesque bits" by the aid of the camera. Mr. G. H. Birch exhibited a number of washed-in pencil sketches illustrative of a recent tour in the neighbourhood of Chartres and Angers; the Rev. Fuller Russell showed carvings in oak and ivory of saints' figures and sacred subjects; Major Heales a sixteenth century wrought-iron coffret; and in a lower room was a choice array of illuminated and other MSS. and early books and engravings.

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THE AWARDS AT THE SANITARY CONGRESS AT CROYDON.

REPORT OF THE JUDGES OF THE EXHIBITION.

WE, the undersigned, the Judges appointed by the Council, beg leave to recommend to the Council the following distribution of Medals and Certificates.

We recommend that Medals should be awarded to the undermentioned exhibitors:—

Fraser Bros., Commercial-road East, London, for patent portable disinfecting apparatus. Charles W. Walker, 1, Chivalry-road, Wandsworth-common, for acid pump and syphon. James Sinclair, 104, Leadenhall-street, for "Tyndall's" smoke respirator. William Lascelles, 121, Bunhill-row, London, for concrete bath, in one piece. Willcocks and Co., Burmantofts, Leeds, for silica glazed and enamelled fireclay bricks and faïence. Hamilton and Co., 255, Kingsland-road, London, E., for Patent Prismoidal Pavement, and floor lights. W. P. Wenham, 81, Church-street, Croydon, for an improved open or closed range kitchener. H. Doulton and Co., Lambeth, for patent anti-percussion high-pressure valves. Aveling and Porter, Rochester, for improved six-ton steam road roller.

We further recommend that Certificates of Merit be awarded to the undermentioned exhibitors:—

Peter Hinckes Bird, F.R.C.S., 1, Norfolk-square, London, for his method of "costless ventilation." U. Knell, 77, Fore-street, London, E.C., for his "Imperial" ventilating window. E. Headly and Son, Exchange Ironworks, Cambridge, for patent hose reel. Benjamin Finch and Co., Sanitary Works, 181, High Holborn, London, W.C., for large-way waste plug with protective cover. Dr. Ancell Ball, Spalding, Lincolnshire, for patented folding invalid bed. *Chorlton and Dugdale, 19, Blackfriars-street, Manchester, for "Excelsior" spring mattress hospital beds. *Pocock Bros., 235, Southwark Bridge-road, London, for universal tubular air and water bed. George G. Bussey and Co., Museum Works, Rye-lane, Peckham, London, for patent spring mattress. George Bray and Co., Blackman-lane, Leeds, for improved gas burners. George Jennings, Stangate, London, for "Artisan Dwellings" sink. Willcocks and Co., Leeds, for fireclay sanitary sinks and water troughs. G. E. Webster and Co., Market-street, Nottingham, for Webster's patent photometer. *Legrand and Sutcliffe, 100, Bunhill-row, London, for improvements in internal driving of tube wells. Selig, Sonnenthal and Co., Lambeth-hill, Queen Victoria-street, E.C., patent safety belt shippers. J. C. Edwards, Trefynant, Ruabon, for Dean's patent external drain traps, with movable receptacle. Beard, Dent, and Hellyer, Newcastle-street, Strand, for patent "ventilating drain-syphon." Hygienic Stove and Grate Company, 15, Peel-buildings, Birmingham, for "Eagle" sanitary trap, for superseding bell traps. H. Doulton and Co., for decorative tiles for covering walls and floors. W. P. Wenham, 81, Church-street, Croydon, for Boyle's Mica valved outlet ventilator. George Jennings, Stangate, London, for Universal shampooing apparatus. Billing and Co., Hatton-garden, London, for the Workman's cooking-stove, and other improvements in gas-cooking stoves. *Moule's Patent Earth Closet (Limited), 5*a*, Garrick-street, London, W.C., for patent earth closet. *Sanitary Appliance Company, Factory-lane, Salford, for Morrell's patent cinder-sifting ash closet. John C. Onions, (Limited), Birmingham, for Moser's patent self-acting dry closet. *J. E. Ellison, Leeds, for conical ventilators. James Sinclair, 104, Leadenhall-street, London, E.C., for chemical fire exterminator. Thomas Waller, 47, Fish-street-hill, London, E.C., for cooking stove with warm-air chamber. Samuel Stretton, M.R.C.S., Kidderminster, for a folding-bier and car, for simplifying funerals. S. and E. Ransome and Co., 10, Essex-street, Strand, W.C., for Milwaukee glass lantern (for hurricane lantern). Mrs. Amelia Lewis, for patent tin cooking utensils. F. W. Clark's Portable Gas Apparatus Company (Limited), Great Queen-street, Lincoln's Inn-fields, for patent portable gas apparatus, for manufacturing gas from gasoline. J. G. Stidder and Co., Southwark Bridge-road, for swivel, lock-plug, and overflow for sinks. Hammond and Hussey, Croydon, for Hornibrook's patent catchment grating for steep gradients. G. E. Pritchett, F.S.A., Bishops Stortford, for barometrical and thermometrical instruments. H. Doulton and Co., Lambeth, for disconnecting gully, with back and side entrances and iron grating. R. Adams, 7, Great Dover-street, London, for patent adjustable shoe, and regulating spring hinge for swinging doors. R. Adams, 7, Great Dover-street, London, for fanlight openers and casement fasteners. The Patent Victoria Stone Company, 305, Kingsland-road, London, N., for artificial stone tubes. Henry Sharp, Jones, and Co., Bourne Valley Pottery, Poole, Dorset, for rock concrete tubes. *G. E. Pritchett, F.S.A., Bishops Stortford, for improvements in hollow tile flooring.

There are two classes of exhibits which we recommend should be excluded from awards of Medals—namely, those which were exhibited at Leamington or Stafford and to which a Medal was then awarded; some of which we recommend should receive certificates, and these we have distinguished in the foregoing lists by asterisks; and secondly, objects exhibited or invented by any of the Judges themselves; such as Mr. William Eassie's exhibit of specimens of bad plumbing, and Mr. Rogers-Field's self-acting flush tank, exhibited by Messrs. H Doulton and Co.

The undermentioned articles we are unable to express an opinion upon without testing; and we recommend that they should be tested at the expense of the exhibitors, if they are willing to incur the same.

Deferred for Practical Trial.

Water heaters and detached bath heaters. Arcanum Plating Works, Birmingham, the Arcanum process of silver-plating steel.

Disinfectants.—Mackey, Sellers, and Co., 102, Bouverie-street, London, W.C., oxychlorogene. Sanitas Company, sanitas disinfecting fluid. W. Jones, 37, Mincing-lane, London, lustro-disinfecting fluid. Jeyes' Sanitary Compounds Company, Jeyes' perfect purifier. Sutton and Phillips, Stowmarket, "Sperokton" (Professor Tuson's patent.) W. T. White, 232, Kennington-road, euchlorine disinfectant. F. C. Calvert and Co., carbolic acid.

Aerated Waters.—Richard Evans and Co., Wrexham, zoedone (Patentee, David Johnson, F.C.S.). James Packham, Croydon, aërated waters in silvered syphons; specialité seltzer water. Newry Mineral Water Co. (Limited), Islington, Liverpool, ginger ale, ginger beer, lemonade, &c. Samuel Gulliver and Co., Aylesbury, mineral and aërated waters.

Filters.—G. H. Flood and Co. (Limited), Holland-street, Blackfriars-road, Bailey Denton's filter. P. A. Maignen, 5, Tower-street, London, patent "filtre rapide."

Hopper Closets (one specimen each).—Doulton and Co. Beard and Dent, artisan closet. Warner Sharpe's hopper closet. William Ramsey (Limited), Dodd's ventilating hopper closet. Stidder, infirmary closet. Thos. Smith, Old Kent-road. W. and S. Carsley, Bartholomew-close, Jewel's hopper closet basin with washer clip, and iron trap with connecting T-piece in one casting; wash-out closets (one specimen each). Henry Owens, Doulton and Co. Ramsey, Dodd's ventilating wash-out. Stidder, single-arm flushing monkey. Bostel, Brighton excelsior, Doulton and Co., Lambeth, Fowler's self-acting closet.

Miscellaneous.—Ryan and Ryan, rainwater percolator. Frederick Gardner, Hereford-road, Bayswater, patent level cot for use on shipboard. The Silicate paint Company, Charlton, Kent, enamel paint petrifying liquid and paints exhibited. Keen and Sons, Gay's solution. S. and E. Ransome and Co., Essex-street, Strand, porous slabs and rain-water filters. Pamphillon and Co., Whittlesford, Cambridge, patent smoke consumers (Peyton's patent). William Lascelles, Bunhill-row, concrete construction. Stidder and Co., Southwark Bridge-road, urinette. Potter and Sons, Oxford-street, London, H. Saxon Snell's patent ventilating hot-water open fire-grate, "The Thermhydire." Benjamin Finch and Co., High Holborn, London, a 4-in. ball valve for large cisterns with balanced valves. W. Woollams and Co., London, paper hangings stated to be free from arsenic. W. S. Carsley, Bartholomew-close, urinals, iron traps, and sink, coated by Professor Barff's process. H. Braithwaite and Co., Swinegate, Leeds, patent syphon for water-closet cisterns.

Washing and Wringing Machines (one specimen each).—J. M. Bell and Co., Oxford-street. Thomas Bradford and Co., 140, High Holborn. Donald and Co., 33, Cornhill. Harper Twelvetrees, 40, Finsbury-circus. Thomas Green and Son (Limited), 54, Blackfriars-road, Monarch washing, wringing, and mangling machine. Ryan and Ryan, Imperial-arcade, Ludgate-hill.

Until the deferred trials have been carried out, we are unable to award the gold medal of the Institute.

We have found that alterations have been made in certain exhibits to which medals and certificates were given, by which alterations some of the essential merits for which medals or certificates were awarded have been destroyed. Notwithstanding such alterations, the exhibits are advertised and stamped as having received the medals or certificates. We, therefore, recommend that notice of this should be taken by the Council; and that in future each person receiving medals or certificates should be warned against using the name of the Sanitary Institute in connection with any article which has been altered since the award was made.

We also advise that in future the exhibitors must give full particulars of each exhibit, in order that a proper number may be fixed to it in the catalogue.

(Signed) W. H. Corfield.
Rogers Field.
W. Eassie.
H. C. Bartlett.

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CHURCH SEATING.

Among the subjects considered at the recent conferences of the diocese of Ely was "the best mode of seating congregations in church." Mr. Beresford Hope said that many years ago he had been an active member of a society that had made some noise in Cambridge, the Camden Society, which was celebrated for its "Twenty-three Reasons against Pues." That handbill at that time struck many excellent and worthy people as dark and seditious. The old traitors of the Camden Society were not content by way of open seats with anything short of the dignified though somewhat unwieldy benches of the fifteenth century. They wanted old models of poppy heads, and he himself was to this day confronted in them with the evidence of his reckless juvenile extravagance. A chair was a cheap thing compared with a bench. He knew there was a certain sentimentality about it. People fancied that a bench meant sleeping through the sermon, and that a chair meant keeping awake during prayers.

A little consideration had shown that the distinction was mainly geographical, and that chairs mostly flourished in France. He did not recommend chairs for universal use, but in transepts and aisles, where the people could not be always ranged with the general body of the worshippers, and there they should not be too close together. He did not approve of the expedient of placing a wand or similar contrivance along the backs of the chairs, which was really turning them into benches and depriving them of their special merit of adaptability. Chairs should be left free, to be turned about to suit the comfort of the worshippers.

The old bench was the best; not a square, heavy one, but a light form of the article. The first benches after the reformed type were introduced by that excellent man, the late Richard Carpenter, in the Church of St. Mary, Munster-square. The outline of them was curvilinear. There was a curved back, graceful in outline, not sufficiently sloping to make repose too easy, but not so straight as to make attention painful, and the whole could be easily moved. There should always be plenty of room to kneel between the rows. The part in front had two uses, one for the kneeler to lean against, the other to hold the books, and a single ledge will seldom serve for both. In Sir Frederick Ouseley's church at Tenbury there were kneelers specially devised for comfort in sitting and kneeling, but they were rather too expensive for general adoption, and on the whole he inclined to hassocks, which could be arranged so as to suit each one's angle. A light material, a graceful form, and not too much ornamentation were what he recommended; and, except where they had plenty of money to spend, a deal bench was to be preferred to an oak one. When the windows were all of stained glass, when the reredos had been erected, and when the curate and choir were endowed, then they might go to the expense of oak benches.

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The foundation-stone of a new English Congregational chapel, in course of erection in the London-road, Corwen, Merionethshire, was laid on Monday week. The contract for erection has been taken by Mr. D. Trew.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Liverpool.—The third meeting of the Liverpool Architectural Society was held on Wednesday evening. Mr. Henry Summers, F.R.I.B.A., the president, occupied the chair. After several new members had been elected, a paper by Mr. W. Pettit Griffith, on "The Education of an Architect," was read by Mr. Charles Aldridge, and an interesting discussion followed.

Manchester.—Mr. B. H. Thwaite, of Bolton, read a paper before the Manchester Architectural Association on Tuesday night, entitled "Commercial Decadence, and its relation to Architecture." After remarking that commercial progress is synonymous with that of art, he traced the influence of commerce on the art of the Egyptians, Phœnicians, Assyrians, Greeks, Etruscans, Romans, Venetians, and on the architecture of the Victorian era, pointing out that the luxury evinced in their architecture at certain epochs in their history was a sure evidence of commercial decadence, he concluded:—"You must not forget that our country has entered upon a new and severe ordeal, a battle of commerce against America, Belgium, France, Switzerland, Russia, Germany, Hungary, and even India, and it behoves all true patriots to help her by indomitable energy, ingenuity, industry, sobriety, and economy to pass safely through the ordeal. By excellence, purity, beauty, and especially by cheapness of workmanship, England may retain her proud position as the first commercial country in the world; but if these moral truths are neglected, her fate will be that of the once glorious Venetian Republic."

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ARCHÆOLOGICAL.

A Prehistoric Excavation in Cincinnati.—A gentleman of the name of Shassern, living about eight miles southeast of Cincinnati, in that section of country long known as Chimney Pierre Hills, is reported to have made a wonderful discovery of a cavern cut in the solid rock, which, if true, will take its place as a most remarkable archæological discovery. Following along a little path through the hazels skirting the foot of the immense bald table of rock known as Chimney Pierre, he heard the faint bleating of a sheep, apparently from behind a great standing splinter torn from the mass until a broad fissure parted the two. Thinking his animal had become entangled in this fissure, he sought to steal around the fragment next to a precipitous bluff, when he lost his footing and fell over some 15ft., alighting upon a smooth, flat stone concealed in a dense mass of undergrowth. To his intense alarm the stone began to sink beneath the surface, and before he could recover from his fall he found himself in the midst of a vestibule cut out of the solid rock, the walls of which were adorned with the most vividly-coloured paintings of men and animals. The ceiling, which was dome-shaped and about 11ft. above the floor, was adorned with the figure of a giant-sized man in the act of placing faggots in what appeared to be designed to represent the sun. Upon the sides were painted in black and brown colours the figures of animals he says he never saw even pictured—huge tusked and trunked beasts, like elephants, with masses of shaggy hair falling about their heads and shoulders; great cat-like beasts striped like tigers, and with tusks protruding from their mouths. In the midst of this throng of wild beasts, upon a yellow background, is delineated the form of a man, seated in some kind of a vehicle, much like—from Mr. Shassern's description—an ancient Roman chariot. The whole of these paintings bear inscriptions which could not be read. On one façade of this prehistoric temple (for such it must have been) this artist of antiquity had depicted birds and fowls, curious and gorgeous, score after score of them, says Mr. Shassern, none of which he could recognise as now common in this country. The colours he describes as peculiarly charming and bright.

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Shoreditch Tabernacle, a new building in the Hackney-road, near Shoreditch Church, was on Monday opened. The building, which is in the Lombardic style, is of red brick, with Portland stone dressings. There are seats for over 2,000 persons. The building has been erected from the designs of Mr. T. Lewis Banks by Mr. Josolyne.

COMPETITIONS.

Bootle.—At the last meeting of the Bootle Town Council the proceedings of the General Purposes Committee came under consideration, together with the following communications from the competing architects for the new town-hall.

9, Queen Victoria-street,
Mansion-house, E.C.,
October 18th, 1879.

Dear Sir,—In further reply to your letter of the 7th inst., I beg to state that I have prepared quantities (omitting the towers and carving), copy of which I inclose, and I have received a tender amounting to £6,593 16s. 8d. based on these quantities. I beg to recall the fact that the original conditions did not stipulate that the Oriel and Trinity road elevations should be carried out in stone, and in issuing the conditions of August 6th, I think the great cost of stone-work could not have been borne sufficiently in mind. The problem thus given to the competing architects was rendered so difficult of solution that after consideration my final resolve was either reducing the requirements or increasing the cost by slightly lessening the sizes of the rooms, and carrying out the two fronts in red brick with Storeton stone dressings. I am of opinion that the above tender could be reduced to £6,000, especially if the benefit of local competition be obtained. It is impossible for anyone to know what a building will actually cost, until the quantities are taken up. This cannot be done before submitting the competitive design, on account of the shortness of time and probable loss of labour in preparing fresh and perhaps useless drawings. For the sake of comparison the cost of the building at 4¼d. per foot.cube, would be £6,607 11s. 8½d., which I think must be said to be a low sum for a public building. I shall be most happy to meet the committee to suggest sundry improvements in the plans, and I hope that the tender submitted will meet with their approval, and if the building be entrusted to my supervision I feel confident of carrying out the work satisfactorily. I am erecting public halls, baths, and wash-houses for the Corporation of Manchester at a cost of £20,000, and beg that a reference be made to them, as to my capability as an architect.—I remain, dear sir, yours very truly,

John Johnson.

T. D. Pierce, Esq.

P.S.—I have returned plans.

20, Mansfield Chambers, Manchester,
Oct. 24, 1879.

Dear Sir,—In accordance with your letter of the 7th instant, I beg to forward the builder's tender, based upon the inclosed bill of quantities for the new Town Hall as a pure design, marked "Experience B.," for the sum of £6,240. I have known Mr. Harrison during the past twelve years, and he is well qualified, in every respect, to carry out this work. He has recently built satisfactorily, a large public building, and other works under my superintendence, and is now employed by the corporation of Manchester and Owens College, Manchester. Having inspected the site, and noticed the prominent position the new Town Hall will occupy, I saw the great and important advantage of introducing a clock tower, as not only affording thereby a considerably more imposing effect, but a great improvement to the façade of the building, beside an immense public convenience to the surrounding neighbourhood. With this view, I have prepared a sketch for the inspection of the Committee. The additional cost will be about £465. Being personally unknown to the Committee, I beg to add that I have been in business for 25 years, and have now in hand (among others) the following works:—1st. Town Hall, at Eccles, Manchester, £5,000; 2nd. Church at Blackburne, for the Mayor of Blackburne, £8,000; 3rd. Bradford Board Schools, £5,003; 4th. St. George's School at Manchester. Also I may name the following gentlemen (among many others), who have known and employed me for many years:—Mr. J. Robinson, J.P., Westwood Hall, Leek; E. P. Stewart, London (£22,000); Rev. Canon Birch, Prestwich, Manchester; Ven. Archdeacon Birch, Blackburne; Mr. J. W. MacClure, J.P., Manchester; Manchester Carriage Company; Phœnix Fire and Life Office, Manchester. Trusting my designs may meet with the approval of the Committee,—I remain, yours truly,

Jno. Lowe.

T. D. Pierce, Esq.,
Town Hall, Bootle.

It was next resolved "That the first premium of £50 be awarded to Mr. J. Johnson, of 9, Queen Victoria-street, London, for his design for new Town Hall, under motto 'Plan,' and the second premium of £25 to Mr. John Lowe, of 22, Mansfield Chambers, Manchester, for his design under motto 'Experience B.'" It was next resolved "That the Council erect a new Town Hall in accordance with Mr. Johnson's design, 'Plan,' and that the General Purposes Committee be empowered to enter into negotiations with Mr. Johnson, and, if necessary, to invite tenders for the work."

SCHOOLS OF ART.

Tonbridge.—The sixth annual distribution of prizes and certificates to the Science and Art Classes took place at the old town-hall, on Thursday, the 6th inst. The report of the art classes showed that they continue to be self-supporting. The number of students in the morning classes has somewhat decreased, and that of the evening class has remained stationary. The total number of students was 84, of whom 41 belonged to the industrial class, and the number in regular attendance was 55. At the May examinations 34 students presented themselves, of whom 11 students passed, two of these in four subjects. Four hundred and fifty-eight works were sent to South Kensington, and for meritorious work sent up two 3rd grade and six 2nd grade prizes were awarded. The committee urged the necessity for providing a more suitable room for the classes, and it was stated that the science classes were in a state of suspended animation from the want of a proper and central room.

CHIPS.

A new Presbyterian church, which has been erected in Priory-street, York, was opened last week. The style is Italian Renaissance; the architect, Mr. T. Brownlaw Thompson, Hull. The total cost has been about £5,000.

The death is announced of M. Poelaert, architect of the Brussels Law Courts. He was the most brilliant pupil of Visconti, the restorer of the Louvre, and designed the new Belgian Mint and the churches of Laeken and St. Catherine.

The Bishop of Truro is said to have withdrawn his name from the Society for the Protection of Ancient Buildings. According to the *Academy*, this step is due to the society's writing to ask the bishop whether there was any truth in the rumour that it was intended to destroy the Church of St. Mary, at Truro. Probably an attack on Mr. Pearson is contemplated.

Mr. Orr, whom we referred to as "the chemist" of the Silicate Paint Co. in our notice last week, is really one of the partners. He is, we believe, all the word means, but does not, of course, fill the position with regard to his firm that its employment in our notice would convey to outsiders.

The new municipal buildings at Perth are now so far completed that the Council-Room was formally opened last week. The building, the plans of which were prepared by Mr. Heiton, Perth, is in the Tudor style. The total cost of the building is about £12,000. All the work has been carried out under the superintendence of Mr. George Wells, the master of works.

The Leyton Local Board decided on Monday week to institute proceedings against the owners or builders of houses who have apparently broken the by-laws of the Board in their erection, and at the same time referred to the sanitary committee the question of appointing a salaried inspector of buildings.

A new church was opened at Fergushill, near Kilwinning, on Sunday week. It is Gothic in style, measures 75ft. by 37ft. 6in., seats, including end gallery, 550 persons, and has cost £2,000.

A memorial window recently erected in St. Lawrence Church, Norwich, as a mark of esteem for the late rector, the Rev. Joseph Crompton, was unveiled by the Mayor of Norwich on Thursday in last week. The stained glass has been executed by Messrs. Austin, Clayton, and Bell, and represents three incidents in the parable of the Good Samaritan, with figures above of a king, bishop, priest, and deacon. The stonework was carried out by Mr. H. Hammond, of Norwich.

The Grays Thurrock burial board received at their last meeting tenders of land for a new cemetery, and decided to purchase the land nearest the town, that at Sockett's Heath, belonging to Mr. Horncastle, at £125 per acre.

New schools are being erected for the Tipton School Board at Burnt Tree and Tipton Green, from the designs and under the supervision of their architect, Mr. C. Round. Mr. J. Adams is the contractor for both schools.

Works of sewerage are being carried out in Lea Bridge and Leyton roads, and other parts of Leyton. The contractors are Messrs. John Aird and Sons, and the work is being carried out under the supervision of Mr. A. Ashbee, surveyor to the Leyton local board, Mr. Bailey Denton being the engineer.

The Harborne and Smethwick School Board on Monday week instructed their architects, Messrs. Sharp, as to plans for a school for 450 children to be erected on a site in Harborne Heath-road.

The Wesleyan Chapel at Newton-lane-end, Wakefield, is in course of enlargement; the contract has been taken by Messrs. Parker and Holmes, of Lofthouse and Stanley. Memorial stones were laid last week.

Messrs. Larmuth and Sidebotham, of Salford, inform us that they were awarded a certificate for school furniture at the late York Fine Art Exhibition. Their names were omitted by us in the list of awards we published a fortnight since.

New classrooms have just been added to the Grove Baptist Sunday-school, at Stratford, E. Messrs. Hoskings were the contractors, and Mr. Buxton the architect.

Building Intelligence.

Australia.—The *Maryborough* (Queensland) *Chronicle* of the 2nd September last records the opening of St. Paul's church there as the cathedral for the diocese, describing it as "an edifice in point of dimensions, construction, architecture, and—to coin a word—free-from-debtedness far ahead of anything of the kind in Brisbane or any other part of the colony." The length of the church is 130ft., including chancel 25ft. The breadth is 54ft., and sitting accommodation is thus provided for 800 people. The lower walls are 14ft. high, the main roof being supported on twelve arches, 30ft. high, on iron columns, the roof, which is covered with Welsh slates, being at its apex 50ft. from the ground. The walls are brick, cemented on each side. The design was by Mr. F. D. G. Stanley, a colonial architect.

Leeds Leather Market.—This market is the property of a company of shareholders, and was erected in the year 1824. It was used as a general provision market until October, 1827, when it was opened as a leather market, and quarterly fairs were held for some years, but, afterwards, half-quarterly fairs were established, and are now held. It has recently been enlarged and improved, to adapt it to its present requirements. The buildings consist of thirty-three small shops (which are let to tanners, factors, dealers in leather and tanning material), inclosing a courtyard (roughly-speaking, in the shape of a horseshoe), and entered on two sides by cartways. In the centre is a circular building, or rotunda, in the shape of a small tower, surrounded by a colonnade of massive masonry, and containing a committee-room. There is also a space above, under a hemispherical dome, originally intended to contain a fan, to pump water into the tank, or reservoir, over the colonnade. In the early part of the present year, an effort was made to raise a fund for roofing-in the open courtyard, and the committee were so far successful as to be able to proceed with the work. The heavy stone colonnade, consisting of twelve large pillars, frieze, and cornice, and tank over, have been removed, in order to increase the area of the courtyard, or market floor. The whole has been covered over with a light timber boarded roof, the upper parts, near the ridge, being of glass. The inside walls are boarded, and painted in two shades of colour. The old irregular stone paving has been taken up, and the whole of the flooring has been laid with cement slag concrete; and it is universally admitted that these alterations considerably enhance the comfort of those who attend the market. The works have been carried out from the plans and under the direction of Messrs. Henry Perkin and G. B. Bulwer, of Leeds.

Leicester.—The new chancel which has been recently added to St. George's Church, Leicester, was consecrated on Tuesday week. The chancel, choir vestry, the clergy vestry, and organ chamber are all quite new, as are the sedilia. The roof of the chancel has carved corbels and columns supporting hammer beams. The other portions of the church have undergone considerable alteration and renovation. The old choir gallery and organ loft has been entirely removed, the high pews in the nave and aisles have been replaced by open pitch-pine seats, and the floor has been relaid with Yorkshire flags. The pulpit has not yet been fixed. The chancel is in the Late Decorated style. It has been built of Belper stone, from designs of Mr. Blomfield, London: the contractor being Mr. H. F. Allen, of Leicester.

Metropolitan Board of Works.—At this meeting on Friday, Mr. H. Morley was promoted to the position of assistant-clerk in the engineer's department, at a salary of £320 per annum, and Mr. F. W. Maut was promoted to first-class in the same department, at a salary of £200 a year. The Board resolved to contribute one-half the cost (estimated at £6,840) of an improvement in Hare-street, Woolwich, about to be carried out by the Woolwich Local Board. The sum of £28,000 was agreed to be advanced to Islington Vestry, for new granite paving works, and £24,500 to Rotherhithe Bath Commissioners, for building baths and wash-houses; permission was given to the Lewisham District Board of Works, to borrow £1,300 for additions to their hospital, and to the Bermondsey Vestry to borrow £12,000, for purchasing freehold land, on which they propose to erect a vestry-hall, offices, and stables. It was referred to the Building Act committee to obtain, or have prepared, plans of all the theatres in the Metropolis.

Sheffield.—The new Burton-street Board Schools, Sheffield, were opened on Monday. The buildings are of stone, with rock-coursed facings, and ashlar dressings. The rooms throughout have dados of varnished pitch-pine, and all the lobbies and staircases are lined with glazed bricks. The contract was taken at £10,700, and has been carried out by Messrs. Chambers and Son, of Sheffield. The work has been in charge of Mr. William Dickinson as clerk of works, under the direction of the architects, Messrs. Innocent and Brown, of Sheffield.

St. Teath.—The parish church of St. Teath, Cornwall, was consecrated last week after restoration. The church was built late in the 15th century, with the exception of the south aisle and chancel, which are Early Perpendicular, and the tower, which was erected in 1630. The nave and chancel roofs are for the most part new, but the original character has been preserved. Screens of traceried wood surround the north and south chapel, as of old. The north chapel forms a vestry, and the other an organ-chamber. The tower arch has been thrown open and a traceried screen placed underneath. Such remains as there were of the ancient rood screen have been worked into the fronts of the chancel stalls. The chancel is fitted with oak stalls, having carved poppy-heads, by Mr. Hems, of Exeter, who has executed two angels in adoration, which are fixed at the feet of the principals, where the chancel roof begins. A portion of the chancel furniture, and a handsome oak lectern, made by Mr. Hems, were given by Mrs. Nosworthy. The altar cloth was supplied by Jones and Willis. The restoration has been conducted under the direction and superintendence of Mr. Hine, F.R.I.B.A., Plymouth, and the general contractor has been Mr. Wiffin, of Bradford, North Devon. The cost is £900.

Sunderland.—The new museum and library at Sunderland was opened last week. Designs for the new museum and library were advertised for by the Corporation in 1877, and six architects competed. The successful plans were those prepared by Messrs. J. and T. Tillman, of Sunderland. The building is in the Classic style, and is divided into three sections, a central block and two wings. The entire length of the structure is 200ft.; its extreme height to the summit of the dome in the centre of the principal section is 75ft., while the height of the wings is 40ft. The buildings are of stone, and rest on a basement of rock-faced ashlar, built on a foundation of cement concrete 6ft. thick. The principal entrance to the building is under the central dome. The ground-floor of the right wing is devoted to the requirements of the Free Library. The left wing of the building is occupied by the museum, which is 75ft. by 35ft., and 41ft. to the apex of the roof, with a curator's room 20ft. by 15ft. Round is a gallery, reached by a circular metal staircase. The winter garden behind the museum and library, facing into the extension park, is of a light and ornamental character, 156ft. long, 42ft. wide at each end, and 50ft. wide in the centre. Mr. Robert Allison, of Whitburn, is the contractor for the whole of the works, and Messrs. J. and T. Tillman, of Sunderland, are the architects.

Todenham.—The parish church of Todenham, which is dedicated to St. Thomas à Beckett, was reopened last week, after undergoing complete restoration from the designs of Mr. J. E. K. Cutts, of Southampton-street, Strand. The church consists of chancel, nave, north aisle, a fine western tower and spire, south porch, chantry chapel, or Manor aisle on south side nave, another chantry chapel, or Lemington aisle, on north side of chancel, and ancient vestry. The earliest part of the church is a fragment, the north east respond and arch corbel, of the Norman nave arcade. The present nave arcade is probably Early English, and the remaining features of the church range in date from the middle of the 14th to the close of the 17th century. The restoration works comprise the repair and opening out of the old timbers of nave and chancel roofs; the restoration of tracery of windows, which had, with exception of tower window, been completely removed; the cleaning and general repair of the masonry; the cutting down and remodelling of the seats, which were of good oak, and now make comfortable and sightly open benches; new tile pavings—in the chancel, of red, black, and buff, enriched with encaustic and green borders; and in the nave, of simple red, black, and buff, laid in patterns; new altar-table, pulpit, and lectern, all of oak, and a simple screen of pitch-pine in the tower arch. The altar cloth was worked in London, from designs and under the superintendence of the architect. Mr. Barnes, of Witney, was the contractor.

Treeton.—The village of Treeton, which is situated about three miles from Rotherham, possesses one of the most ancient parish churches in the district. It is dedicated to St. Helen, and consists of nave and aisles, with a noble and well-proportioned chancel, to which is attached a south aisle of the Late Perpendicular Period. In 1866 the rector caused the chancel to be thoroughly restored by Messrs. M. E. Hadfield and Son, of Sheffield. Some time ago, however, a movement was set on foot for the restoration of the nave, tower, north porch, vestry, &c. The architects, Messrs. M. E. Hadfield and Son, who carried out the restoration of the chancel, were commissioned to prepare the necessary designs, and it was estimated that the total sum required would not be less that £1,500. It was felt that this was too large a sum to raise at once, and it was therefore decided that the most urgent part of the work should be carried out first. The old seats have been taken away and new pitch-pine ones of a modern character erected in their places. A new pulpit executed in alabaster and Hopton Wood stone, and containing some finely-carved panels, has been erected in the church at a cost of £100. The pulpit is the work of Mr. Boulton, sculptor, Cheltenham. The west door, which is believed to have been closed for about 200 years, has been reopened. To get to the old doors a course of walling had to be removed, and then it was found necessary to replace the old doors by new ones.

Whalley Thorns.—On Saturday the Bishop of Lichfield consecrated the church of St. Luke's, Whalley Thorns, which is a chapel of ease to Bolsover Church. Mr. J. B. Mitchell-Withers, of Sheffield, is the architect. The fabric is built of the magnesium limestone of the district. The building is in the Early English style, and consists of nave 24ft. 6in. wide, by 50ft. 8in. long, with chancel 22ft. long, on the right hand of which is the vestry, and on the left an organ recess. The roofs are open-timbered; at the west end a bell-turret rises over the porch to a height of about 58ft., the upper portion being of oak framing. The roofs are all covered with Staffordshire tiles. The reredos is of glass mosaic inclosed in an oak frame. The whole of the work has been carried out by Mr. Richard Langley, of Bolsover, and the total cost will be about £1,800. The church will accommodate 210 persons.

Wolverhampton.—The church of All Saints, Steelhouse-lane, was consecrated by Bishop Maclagan on Saturday week. It is Early English in style, and has been erected from the designs of Mr. T. Taylor Smith, of London, selected in competition by the referee appointed by the building committee. It comprises a nave 88ft. in length by 25ft. wide and 54ft. in height from ridge to floor; and north and south aisles each 11ft. wide. It is proposed hereafter to add a chancel 34ft. by 22ft. with double transept on north, and organ loft and vestries. The nave and aisles have open-timbered roofs with plaster between the rafters; it is proposed to place a similar roof over the double transept and to have a boarded barrel roof to chancel with moulded perlins and ribs. The external walls are faced with a local red sandstone and the interior walls are finished in red bricks with similar dressings. As the funds have not permitted of the erection of a tower, a bell-cot has been placed over the future chancel arch. The seats are open and the gas-fittings are of brass, specially designed. The contractors were Messrs. G. and F. Higham, of Wolverhampton.

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A Local Government Board inquiry was recently held at Workington, before Mr. Arnold Taylor, C.E., inspector, with reference to an application from the local board for sanction to borrow £2,273 for works of sewerage, gas, and water supply.

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[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J, Passmore Edwards.

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J. R. (D. Crossley, Brighouse, Yorks. See pp. 405 and 481, Vol. XXXII. 2. J. Gillingham, Chard, Somerset.)

"BUILDING NEWS" DESIGNING CLUB.

X. L. (We require the sheet to be of the size named—22in. × 14in., any space not filled by general drawings may be occupied by details. The scale must be adhered to.)—W. S. D. (Strong room may be put in basement.)—Stone. (The 20ft. × 18ft. is intended to be a rectangle, including the side entrance.)—Mente Manuque. (We have made note of your estimate.)—Pendennis, J. C. (If we have received your design it is noticed in the criticism.)—W. J. B., Tim, Castello.

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Correspondence.

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RESTORATION AT ST. ALBAN'S.

To the Editor of the Building News.

Sir,—The clerk of the works at St. Alban's is a trifle too fast in his laudable desire to defend what has been done in the work under his supervision. It is well that he should caution your readers to "believe nothing that they hear, and not one-half of what they see," just before indulging in the grossly misleading statements which he has thought fit to make. It might not seem worth while to reply to such an epistle, but the question is of too much interest and importance to let it pass without further notice; for I deny, not the plausibility, but the possibility, of what he asserts as indisputable fact. I deny that the old corbel table to which I referred (called by him a cornice) "was built on a wall raised 5ft. 6in. in the thirteenth century," and I deny that it was in itself composed merely "of some pieces of Roman tile inserted for repairs, a course of common brick manufactured within the last fifty years, and the remainder of common roofing-tiles, and plastered."

He might have observed that I did suggest the possibility of its being of later construction, and at the time of the controversy I purposely raised this very question, hoping that something would be said about it. But I did not succeed in getting a "rise" out of him, or out of any of those who might be supposed to be informed on the subject.

By some of the best authorities this corbel table was supposed to have been constructed in the thirteenth century, when the stone string was introduced. It, however, remained till now for Mr. Chapple to let us know that it was built upon the top of a raised wall of thirteenth-century date; and then to give force and reality to his statements by a very detailed description of what has no existence in fact.

There was, I maintain, no room for the existence of such a raised wall beneath this corbel table; seeing that there was a space of only 3ft. 10in. from the top of the arch of the Norman window to the bottom of the corbel table. The tiles of which the corbel table was constructed were in thickness just about half-way between his 2¼in. and the thickness of a common roofing tile, of which he says it was composed. He may be quite at liberty to express his own opinion, or to set forth those of others as to the exact date of the corbel table itself; but to support that opinion with detailed description of what really did not exist cannot add much weight to what he says.

I am, however, indebted to him for suggesting a phrase which aptly expresses what I, in common with many others, complain of—that "Bill Stumps his mark" should be so ruthlessly and indelibly written upon every fraction of St. Albans' Abbey, and that the only evidence which might seem to serve as a subterfuge for this alteration should be destroyed; to quote from a letter which I received a short time since, "I have been so disgusted with the alterations I have endeavoured to forget St. Alban's."

I am aware that it must be a sore subject to those concerned in the work which has been carried on, and had the corbel table been left, it would have been a standing memorial against the lines of the new roof. But it is a subject still more sore to those the study of whose life it has been to see in such remains the architectural evidences which have been here so recklessly destroyed.

I cannot leave the matter here. The importance of this corbel table is not at all confined to that of its construction, or of its interesting character. It is intimately connected with the pitch of the original roof and other parts of the history of the Abbey. Having reconsidered it in all its bearings, I am now more than ever convinced of its having been of Late Norman date. There are but three periods to which it could be assigned: (1st) That of the actual date of the thirteenth-century string-course above it, a small portion of which has been rebuilt into the new work; (2nd) That of the date subsequent to this; (3rd) That of the date prior to it. It cannot well have been of the first period named. We cannot suppose, and I have met with no precedent here or elsewhere to show, that the architects of the thirteenth century ever constructed a cornice of that character. Find-it there, they might crown it with a string-course of their own devising, ready to receive the parapet to be raised above it. There are many instances in the Middle Ages of earlier work being thus incorporated into the new. But even supposing the construction of this cornice to be consonant with the period, it is impossible to suppose it would have been erected by the same men who put up the other thirteenth-century corbel table and parapet.

It cannot well have been the second period named, for there is no time since the middle ages at which such a cornice would have been constructed with old Roman tiles, finely cut in the upper part, and with the old stone corbels and mediæval string-course. If constructed subsequently to the making of some of the bricks fifty years ago, as intimated by the clerk of works, it would be interesting to be informed from whence the old stone corbels were obtained, and also to know at what period the lead flashing was put over to protect portions of the string-course, which lead flashing must have been very many years in its old position. If, again, it were constructed previously to the 13th century, there is no time to which it can be assigned but the Late Norman, which is the date of a large portion of the interior stonework. Until these times no "clunch" stone had been introduced into the building. These old corbels were of clunch. They were either very rudely cut or, what is more probable, much decayed, and they had all the character about them of corbels which I have seen of undoubted Norman period.

The mediæval builders never exactly copied or reproduced earlier work. They very often "followed" ideas taken from earlier construction, imparting to their work a character of its own. And it certainly looks very much as though the Early English architect had this corbel table in his eye when he designed his.

And, once more, the lines of the old Norman roof (as arrived at by Mr. Neale, Mr. Street, myself and others, quite independently of each other), accurately coincide with the top of his corbel table, which, as I maintain, formed the eaves-course of the original roof. It could not have been specially constructed for any other of t subsequent roof lines visible. But, being there, it might well have been suffered to remain through the successive changes. It is remarkable, too, also that this corbel table was exactly co-extensive with the Norman work below, not only on the south side, but, if I mistake not, with the more extended Norman work on the north also. Unless the corbel table were coeval with the Norman work, it would be an extraordinary thing that such pains should have been taken at any period of architecture to assimilate it thereto, or to make it coincident with it.

I hope Mr. Chapple will now be able to see that in his attempted sarcasm upon my having "made the discovery that a Norman cornice has been destroyed," he has only succeeded in giving expression to an almost indisputable, though unpalatable, truth.—I am, &c.,

William White, F.S.A.

LINGFIELD.—POUPET.

Sir,—The College of Lingfield was held by clerks under a rector, master, or provost. A tombstone commemorates James de Velito, quandam presbyter hujus Collegii, d. 1558. It is called Ecclesia Collegiata de Lyngfield (*Valor Eccles.* ii., 55), and the rector or master, was Clericus, that is, a Secular. Aubrey therefore wrote "Priests of the Carthusian Order" by a slip of the pen. Carthusian monks were secluded in cells, and had no part in a parish church as at Lingfield, where there was a college of chaplain priests, who had a cloister-hall and chambers; and so the Inventory calls them "the master and brethren of the college" (*Surrey Coll.* vii., 236.) It was one of the many instances of a parish church made collegiate, to which I have alluded in my "English Minsters." What is a Poupet? I presume it means a bench end. Most certainly there was no confessional, but the slit from other analogies may have been connected with an offering-box.—I am, &c.,

Mackenzie E. C. Walcott.

EFFECTIVE VENTILATION.

Sir,—Mr. H. C. Stephens says in the paper he read on this subject at the Sanitary Congress at Croydon, and which appears in your number this week, that in the summer "the air is frequently so still," that "no current can be detected from tubes or other openings communicating with the external air." He admits "that when a fire is burning air will enter through them to compensate for that drawn out by the fire currents," but says that it is in the summer that we are most in need of fresh air. No doubt we are; but at that time of the year we can open windows. It is surely in the winter, when the majority of people keep their windows shut, that it is of importance that the pipes should admit fresh air

I never yet found the "chinks and crannies" of a room sufficient to keep the atmosphere fresh. —I am, &c.,

C. F. M.

BATH CISTERNS.

Sir,—May I ask you to kindly request builders, and if they require it, architects also, to use a little care and thought in placing the cisterns of bath-rooms? I frequently find the hot water and cold water cistern placed so near together that the heat of one greatly affects the other. A lady had a fashionable house recently fitted with a bath-room, and on looking it over, I found the two cisterns within a foot of each other. Again, on travelling to Dublin some time ago, and putting up at one of the large new hotels, I bespoke a cold bath; but on trying to take one it proved that the water was neither hot nor cold, and the waiter explained that the heat of the hot cistern warmed the cold one. Lastly, at my private house in the suburbs of London, I find the two cisterns are within one inclosure in the bath-room, and as the cooler water is also supplied for drinking purposes, it is very annoying in the summer to have one's *aqua pura* raised to a tepid condition—enough to make the drinker sick with its mawkishness. To lessen the evil I have been obliged to wrap the hot cistern in carpeting, but that is not a perfect cure. —I am, &c.,

H. Y. P.

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CHIPS.

To supply temporarily the place of the parish church of Wells-next-the-Sea, Norfolk, destroyed by lightning in August, and to be rebuilt from Mr. A. W. Blomfield's designs, an iron church has been erected at Wells, and was opened last week. The contractor and designer is Mr. J. C. Hawes, F.S.A., of Wandsworth-common.

The Yorkshire Fine Art and Industrial Exhibition at York, which has been open since May 7th, was finally closed on Saturday. The number of admissions exceeded 530,000, and the total receipts from this and other sources amount to £33,507 9s. 7d., and the permanent property remaining in the hands of the trustees is valued at £26,353. In connection with the Industrial Exhibition, 150 medals and 142 certificates have been awarded to 289 candidates. The question of forming a permanent exhibition is under consideration.

At a special meeting of the Naas Improvement Commissioners, held on Friday, a scheme of drainage, prepared by Mr. J. H. Brett, C.E., and estimated to cost between £2,000 and £3,000, was approved.

A new church is about to be built at Treharris near Merthyr. The contract has been taken by Mr. David Jenkins, builder, of Merthyr.

Mr. W. H. Vale, of Maidstone, a well-known antiquarian authority as to the counties of Kent and Hereford, died last week at an advanced age.

The Norwich Board of Guardians are about to enlarge the boys' home, from designs prepared by their architect, Mr. J. B. Pearce, of that city.

The Marylebone vestry decided on Friday to pave Edgware-road with wood from Chapel-street to Upper George-street, at an estimated cost of £8,000.

The monthly meeting of the Glasgow Architectural Association took place on Friday evening, when the president, Mr. J. B. Stewart, read a paper on the works of the late M. Viollet-le-Duc. At the December meeting the subject of "Stone as a Building Material" will be considered, and at the January meeting Mr. Wells will read a paper on "Iron Construction."

A vicarage is about to be built in North-street, Penydarran, near Merthyr Tydfil, for the vicar of the former parish. The architect is Mr. J. B. Fowler, of Brecon.

The memorial sundial recently placed in the disused burial grounds now known as St. Pancras-gardens, and illustrated by us last week, was formally presented to the vestry of St. Pancras on Friday afternoon by the Baroness Burdett Coutts, who, in a short speech, dwelt on the duty of perpetuating the memory of the illustrious dead. In the evening the members of the vestry entertained the donor at dinner in the vestry hall.

A new reredos has been erected in St. Saviour's Church, Walthamstow. It follows the outline of the apse, and has three panels, filled with glass mosaic by Messrs. Powell, illustrating the Nativity, the Crucifixion, and the Ascension.

A new sea-wall, hotel, and terrace is about to be erected at the south-west end of Barmouth town. The undertaking is a private speculation. The architects are Messrs. Stewart Brothers, Wool Exchange, Coleman-street, E.C. The work will contracted for in trades, as in Scotland.

Mr. Nash, late town surveyor of High Wycombe, has just been appointed to a similar office at Maidenhead.

At a meeting of archdeacons and rural deans held at Cambridge on the 31st ult., Mr. John Day, of Bedford, was appointed to the office of surveyor for two years, under the Ecclesiastical Dilapidations Act, 1879.

The memorial-stone was laid on Tuesday week of a new front to Salem Chapel, Biggin-street, Dover, by which the chapel is enlarged and brought out to the building-line of the street. The contractor is Mr. Walker, of Dover.

The South Stockton local board of health have appointed Mr. S. E. Thorold, of North Ormesby, near Middlesborough, as town surveyor, *vice* Mr. Francis Drake, C.E., resigned. There were upwards of 80 applicants for the office, the salary of which has been reduced from £200 to £160 per annum.

We are pleased to learn that the trustees of the British Museum have purchased from Mr. J. Gregory Crace, the splendid collection of maps, plans, and views of London and Westminster, gathered together during a series of years, and at great expense, by the late Mr. Frederick Crace. We described the collection when it was first on view at South Kensington Museum.

Intercommunication.

QUESTIONS.

[5942.]—**Removing Whitewash.**—I am presently about to commence the restoration of a very old church, the oak rafters and principals of which are deeply encrusted with whitewash. Would any of your numerous correspondents inform me of a good chemical solution to wash this clean off, as I have to clean, stain, and varnish them?—W. E. S.

[5943.]—**Brickwork at Quy Church.**—Perhaps some of your readers can help me as to the age of the old brickwork just removed by the hand of the restorer from Quy Church, near Cambridge. It consisted of embattled coping on nave and tower, and bell gable at east end of nave.—Cambridge.

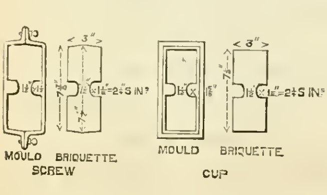
[5944.]—**Valuing.**—I am rather puzzled in trying to practically apply the usual tables for finding the present value of property. Suppose a freehold house in very indifferent condition brings in a net rental of £30 per annum, and suppose another house in very good condition, of similar size, &c., and bringing in the same net rental, how many years' purchase do I take respectively, and why?—Enquirer.

[5945.]—**Terra-Cotta.**—I have introduced buff terra-cotta dressings to the front of a building, and am annoyed to find that many of the blocks are discoloured by a green coating, evidently caused by vegetation. Will those experienced in using terra-cotta inform me the best means to remove it? Rubbing with soap-and-water does not make the least impression.—Manx.

REPLIES.

[5929.]—**Ventilation.**—Mr. J. L. Brookes says "vertical tubes have lately been used which allow the inlet air to enter the room about two-thirds the height." All I have seen have admitted the air about one-third the height of room. Was the room in which the cold air fell "like a cold shower-bath on the heads of the occupants," a low one? I should imagine so. But perhaps the cold air would have this unpleasant effect if the pipe were placed so near the ceiling, even in a room of ordinary height. I have never placed them more than 4ft. from floor, and have not had a single complaint against them. On the contrary, rooms which were before unbearable have been rendered quite comfortable. I remember one particular case, a billiard-room, large enough to hold a full-sized table, but only about 9ft. high. One of these pipes, only one, was placed in a corner opposite the fireplace, and one of Boyle's ventilators in the flue. The difference in the atmosphere of the room was something wonderful. In one corner (not where the pipe was placed) there was a platform. Before the inlet pipe was fixed if anyone stood on it they were soon glad to get down again, but afterwards you could feel no difference between standing on the platform and on the floor. Simply opening the windows top and bottom made no appreciable difference to the atmosphere when one stood on the platform. If I remember rightly, the window-heads were about 18in. from ceiling, but certainly not more. Mr. Brookes recommends that the vitiated air of sitting-rooms should pass through bedrooms to "agreeably warm" them. I think it is generally admitted, even by people who look upon ventilators as new-fangled, that the sooner we get rid of the foul air of our houses the better. In houses already built the simplest way is, as I said last week, to put one of Boyle's ventilators in the smoke flue. But in a new house, where one can form flues as they like, I believe a very good plan is to have a perforated cornice or else a number of outlet gratings just under the cornice, connected with a horizontal flue which is taken into a shaft, the kitchen flue, made of iron, being in the centre of it. The iron flue should be 10 or 12in. in diameter, and at intervals fangs should project from the pipe to be built into the walls of shaft. Of course the heat of the pipe draws the vitiated air from the rooms to the shaft. I have never tried this plan myself, but have heard that it answers very well.—C. F. M.

[5934.]—**Testing Portland Cement.**—Portland cement. The usual tests are its tensile strength, weight, and fineness. Blocks properly called briquettes are made in gun-metal moulds, which are of two principal kinds, called cup-moulds and screw-moulds. A certain quantity of neat cement and water are well mixed on a slate or flag. The cement is then put into the moulds, which are well packed, and pressed, and levelled to top of mould (about 82 per cent. of cement to 15 per cent. of water are very good proportions), the least possible quantity of water the better. After the cement commences to set in the cup moulds they are punched out—at least, the mould is pressed off the briquettes by a press or punching machine. To avoid injury to the block there is an iron plate goes in under it in the matting. Special care has to be taken of those kind of briquettes, as if the cement sets it is impossible to get it out without injury. In the screw mould there is a screw at each end, which, on being opened, the sides are struck away from the briquettes. The following are the sketches of such moulds, &c. This kind of mould is the best, as you can immerse the briquette with the mould on. It will be seen that the thickness of the briquettes are the same, while the respective moulds are 1½in. and 1⅝in. in thickness. The extra space in the cup-mould is occupied by the iron plate as spoken of. After being four hours in the air (according to test), which is a good time for 7-days test, they are immersed in water for seven days, at which time you can form an opinion of the quality of the cement without any loss of time. They are then broken by being subjected to a tensile strain in a machine, which is on the lever principle, in the incisions of the block; cramps of the machine get hold, one is fixed to frame regulated by a screw, the other to the end of lever. The briquette acts as the weight, a cast iron support the fulcrum, and a weight on the graduated arm of the machine the lever. The weight is gradually hauled out on the arm of the lever until the briquette breaks; then you can read the number of lbs. it broke at on the arm. The usual sectional area is 2¼ square inches, which breaking strain should be at least 800lb. for concrete purposes. We get it up to and over 1,170lb. after seven days' immersion with Gibbs and Co.'s cement, which is equal to 10cwt. 50lb., or 4cwt. 72lb. per square inch. Weight.—By allowing the cement to fill, by falling gradually down a hopper, it should not weigh more than 112lb. per imperial bushel. It is usually from 111lb. to 112lb. per bushel. Fineness.—Cement should be very fine—at least, 90 per cent. by weight should go through a sieve with 900 holes to the square inch, without rubbing, when sieved with a horizontal motion only. The 7-day test is the most convenient, and at that time a good and fair opinion of the quality of the cement can be obtained. There are other minor tests on a small scale, which are very good and inexpensive. Proportions of sand and cement are tested in like manner. Cement is tested after being 7 days, 1 month, 3 months, and 6 months in water.—R. Vincent S.



[5936.]—**Hardening Plaster of Paris.**—There have been from time to time many communications in "Intercommunication," evidently from practical persons, relative to the preparation of this useful cement; but none that I have read put it exactly on its true ground. In long ago days, before the establishment of cement mills, plaster was only used by stucco men, and these had generally to prepare it for their own use; the gypsum was never burnt—at least, by those who did fine work; the term was "boiled," not "burnt"; the raw gypsum was pounded and sifted, and the water of crystallisation was driven off into an open pot or pan, the powder being stirred the while, during which operation it assumed all the appearance or a fluid, owing to the rapid escape of the steam, especially from the lower stratum, which kept the whole mass all alive, so that when the surface was disturbed it immediately assumed its own level. When all the water was expelled this peculiarity ceased, the gypsum was given a good heat so as to make sure of its being thoroughly dried, but not by any means to burn it or to let it get red-hot, which was reckoned to spoil it, as if overheated it set too quickly, or merely acted as common lime. In mixing for use the plaster ought to be added to the water, not the water poured on to the powdered plaster; and if any colouring matter be used, such as red ochre, it ought to be at first mixed with the water, so as to ensure equable distribution. If a hard material be required add alum or sulphate of soda (Glauber salts) to the water. These cause the plaster to set with great rapidity, but should it be wished to delay the setting mix with a weak solution of glue or gelatine. This stucco men use in order to give time to trim mouldings, &c. For fine work the plaster may be sifted again after being boiled. It may be kept for any length of time, if kept perfectly dry, and in a place or vessel where it cannot imbibe moisture from the atmosphere. Should this take place, no boiling or brewing will again revive it.—R. J. Lecky.

[5938.]—**Ventilation of Shop Windows.**—If it is possible to insert one or two pipes to admit fresh air with an upward current below the sills of the windows, no doubt the "steaming" "C. H. C." complains of would be cured.—C. F. M.

[5938.]—**Ventilation of Shop Windows.**—The only remedy that has been found effectual in many cases is to have openings above the windows leading outside to a flat, if there one, and covered by a screw ventilator, or connected to a tube or flue.—G.

[5940.]—**Size of Drain.**—If there is a good fall a 4in. drain will do. For the group of four cottages I should recommend a 6in. stoneware pipe, simply because there would be more risk of extraneous matters being thrown down the drains. In theory, derived from hydraulical law, which supposes fluids, a 4in. drain would be sufficient for a group of four cottages; but experience must dictate the size of a house drain, as careless people make hydraulic considerations of no account if they persist in throwing down solids. A 6in. pipe will drain a dozen or more of cottages provided the drains are used legitimately and are not tampered with, but we cannot expect such a state of things to be maintained. The body of a house-drain should therefore not be less than 6in. diameter, but the branches may be 4in. For jointing a band of well tempered clay round the lower half of each socket. Tarred gaskin is a kind of hempen rope or strands of hemp dipped in coal-tar.—G. H. G.

[5941.]—**Settlement in Schoolhouse Walls.**—I should recommend the wall to be propped up and an excavation made at corner of gable that has yielded. I should then carefully underpin the angle and fill up with concrete or brick in cement, and afterwards build a spur of brickwork or a buttress well bonded into old work to prevent further subsidence. An angle buttress, if properly built in to old work and set in cement, or at least, its lower portion, will prevent further mischief. Of course the weak angle of wall or footing would have to be found out.—G. H. G.

STATUES, MEMORIALS, &c.

Sandringham.—The Prince of Wales has just erected, in the Church of St. Mary Magdalen, Sandringham, a tablet to the memory of his sister, the Princess Alice. The work, which has been executed by Mr. J. E. Boehm, A.R.A., consists of a medallion portrait in marble of the Grand Duchess, with an inscription. The design is by Mr. Arthur Blomfield, F.S.A.

WATER SUPPLY AND SANITARY MATTERS.

The London Water Supply.—Cardinal Manning presided on Wednesday at a meeting of the representatives of the organisations in the Metropolitan boroughs, composing the London Water Supply Committee, held at the Archbishop's House, Westminster. Reports of the action taken by the Vestry delegates in memorialising the Corporation of the City of London, and of two conferences held on the subject, were laid before the meeting. Several members of the committee reported that the Water Companies in the East of London and in Marylebone district were beginning to provide a direct supply without the use of cisterns or butts. After some discussion it was resolved "That it is desirable to hold public meetings in the Metropolitan boroughs, with a view of petitioning Parliament on the subject of the London Water Supply," and "That the Vestries be requested to give the use of the Vestry Halls for the purpose of holding the meetings."

CHIPS.

The new Cottage Hospital at Maidenhead was formally opened on Thursday in last week. The architect was Mr. Cooper, and the builder Mr. Woodbridge. Eight beds are provided.

Mr. John Hanvey, C.E., who, since 1861, has been borough surveyor of Dover, died suddenly on Wednesday week from apoplexy on his return home from the duties of his office. When elected from amongst 60 candidates by the Dover Town Council, Mr. Hanvey was occupying a similar position at Gloucester, and during his long term of office in Dover he showed himself to be a man of ability and ingenuity. The improvement of the borough prison, the original East Cliff revêtment, the perfection and extension of the main drainage, and the laying out of the Maison Dieu Estate were efficiently carried out by Mr. Hanvey. He designed and carried out a scheme for the separating the upper and lower services of supply from the waterworks, and inaugurated a system of water inspection that effected a considerable economy. More recently he designed and executed a comprehensive scheme for separating the whole of the surface water from the sewers, and has just completed the East Cliff sea-defences. Mr. Hanvey was 55 years of age.

The Adullam Baptist Chapel, at Felinfoel, was reopened on Sunday, after renovation, lighting with gas, and the addition of vestries. The alterations have cost upwards of £2,000. The architect was Mr. Henry Thomas, of Swansea; and the builder Mr. David Rees, of Ystalyfera, Swansea Valley.

Professor Sidney Colvin is delivering a series of lectures on Raffaelle, at Cambridge, and has such a large attendance that he has to deliver each lecture twice over on successive days.

The Hotel Continental, erected on a site at the corner of Charles-street, Regent-street, W., formerly occupied by Meurice's Hotel, was opened on Monday. It has been built at a cost of between £60,000 and £70,000. The decorations, which have been superintended by Signor Maroloda and Signor Codina, are chiefly in the Japanese style.

The Hove Town Commissioners, at a specia meeting held on Monday, approved of plans and estimates for a proposed new cemetery, estimated to cost, including land, £14,750.

The addition of a new vestry and class-room to the Church of St. Mary Magdalene, Langthorne, has just been completed. A bell-turret has been erected upon the west gable. The windows are filled with stained glass by Messrs. Heaton, Butler, and Baynes, of London. Messrs. Armfield and Bottomley, of Middlesbrough and Whitby, architects, have designed and superintended the additions and alterations.

At Chichester Cathedral a screen of open ironwork has been erected at the entrance of the Lady Chapel, and gates removed from Bishop Arundell's screen at the entrance to the choir have been placed in the new screen. The ironwork was executed by Mr. H. Halsted, of Chichester. The Dean Hook cenotaph is nearly completed, and will shortly be erected in the south aisle of the cathedral.

The Duke of Norfolk is expending over £30,000 on the alterations at Arundel Castle. A new front is being raised on the whole of the east side, from the ancient face at basement level, in flint work, with windows and dressings of Doulting stone. This front is continued with the boudoir, &c., now being erected, making an east façade more than 300ft. in length. The south front is also being carried up from the flint face below. The kitchen and offices are rapidly approaching completion. In the quadrangle the whole of the battlements, mouldings, windows, and doors, which were of Norman character, with their zigzag and semicircular enrichments, have given place to new work in the Early English style. The contractor is Mr. McManus.

Our Office Table.

The trade year of the Staffordshire potteries, which began gloomily, closed last week with encouraging prospects with reference to the business to be transacted with the principal foreign markets, although the home trade is as dull as ever, and colonial business is far from satisfactory. America still continues to receive more English china and earthenware than any other foreign country, and during the last few months there has been a marked increase in the demand. The improvement is greatest in regard to goods of the highest quality. The American potteries are increasing in extent and importance, and extraordinary efforts are being made to compete with English makers. But we are assured that many years must elapse before the decorative ware of America will approach the quality of that produced in England. British North America has shown a falling off of orders just at a time when the demand from the United States began to increase. The declared value of the china and earthenware exported in the nine months ending the 30th of September was £1,300,385, as compared with £1,260,590 in the corresponding months of last year, and £1,288,777 in 1877. The figures for the United States were £493,824 for 1879, £414,404 for 1878, and £454,353 for 1877. Australia is the only other country which does not show a falling off in the nine months, although in some other countries, as indicated above, there have been improvements in the last three months. Many manufacturers, however, aver that though both orders and inquiries have increased, there is still no substantial improvement in regard to profits.

The Session of the Institution of Surveyors was opened on Monday evening by an address from the president, Mr. William Sturge, who now enters on a second year of office. The subject dealt with was the agricultural depression of the past five years. The causes Mr. Sturge showed to be the extraordinary inflation in the commerce of the world culminating in 1874, which created a demand for agricultural produce, thus stimulating production in every country; the further stimulation to extension of area under cultivation in America, induced by the succession of bad harvests in Great Britain; the consequent vastly increased exportations to England; the unsettled state of the labour market, and the loss of capital induced by the several causes has led to impaired cultivation. The remedies suggested were of two classes: first the revival of trade, from the operation of natural laws; and secondly, legislative changes, chiefly in the laws as to land transfer, the introduction of tenant right, the arrangement of liberal covenants between landlords and tenants, and alterations in the incidence of local taxation.

A lecture on art and handicraft was delivered at the Free Library, Wolverhampton, on Saturday week, by Mr. Charles Gregory, art master, of that town. The lecturer pointed out the steady progress that had been made in the public estimation of what constituted true art by the productions of such firms as Elkington, and Mason, and Wedgwood, and Minton, and remarked with especial satisfaction on the ornamentation of the locally-made locks and keys from what were a few years ago objects of mere utility, of very plain form, and no artistic design, as compared with the productions of the present day, some of which were marvels of ingenuity and beauty. He particularised as the four essentials to be considered in making an article of utility and beautifying it by decoration as the use of the article, the nature of the material, the mode of production, and the expense of manufacture. To these might be added four considerations more—namely, the general form of the article, the style of art in its design, the extent of its decoration, and the treatment throughout. They should endeavour to combine in any art manufacture richness without extravagance, elegance and solidity, and to give a thoroughly English character to the work. There should be harmony throughout, and the decoration should serve only as an agreeable addition to the building. A rule of nature too often neglected in most branches of manufacture was that in symmetrical designs the two sides should be proportionate, but should not be exactly alike. In conclusion, he urged every artisan and artist to cultivate his powers of perception and of imagination, as well as his knowledge of art.

An exhibition of a somewhat unusual kind is now open at Boston. (U.S.) Last year Mr. Ruskin exhibited in London a large collection of drawings by Turner, with some of his own which were intended to illustrate them. Professor Norton, of Harvard College, thinking that the illustration of Mr. Ruskin's own work was a sufficient object in itself, and that it would be found interesting and useful on that side of the water, has induced Mr. Ruskin to send to Boston a selection of his drawings, to which he has added some which were in his own possession, so that there are a hundred or more of them now on view in that city. They are arranged in chronological order. Persons who have got their conceptions of Mr. Ruskin's work only from occasional passages in his writings, or from the elaborate engravings published with them, are, according to the *American Architect*, likely to be astonished at the extreme freedom of many of these drawings, at the regardlessness, some may think the recklessness, with which many characteristics of their subjects are passed over in the care for the particular characteristics which were the author's immediate object. Most observers will be struck with the abrupt change which came over Mr. Ruskin's manner at the time when he was at work on "Modern Painters," when he apparently first passed from under the influence of Prout to that of Turner, and the went on to develop his own native manner.

A question of some importance in regard to the liability of a city for its sewers has just been decided in Philadelphia by a referee. The inhabitants of one part of the city had some time ago petitioned the city to convert the Cohocksiak Creek, which drained their quarter, into a sewer. This had been done; but one day there came a rain so heavy that the sewer, though it had served for all ordinary contingencies, proved quite inadequate to carry off the water, which backed up and overflowed the property of the abutters, doing considerable damage. Thereupon several suits for damages were brought against the city, on the ground that it was liable for not having provided a sufficient sewer. These suits were by common agreement referred to a referee, Mr. W. Wynne Wistar, and we find in the Philadelphia *North American* an account of the decision which he has rendered. He holds that, since no defect appeared in the construction of the sewer, the damage, being due only to its small capacity, is to be attributed to an error of judgment in providing for ordinary, but not for extraordinary emergencies. "For an error of judgment," the referee decides, "as a matter of law, a municipality cannot be held liable." Therefore the suits are dismissed.

The railway for the ascent of Vesuvius is now finished. It is 900 metres in length, and will enable tourists to ascend by it to the edge of the crater. The line has been constructed with great care upon a solid pavement, and it is believed to be perfectly secure from all incursions of lava. The mode of traction is by two steel ropes put in movement by a steam engine at the foot of the cone. The wheels of the carriages are so made as to be free from any danger of leaving the rails, besides which each carriage is furnished with an exceedingly powerful automatic brake, which, should the rope by any chance break, will stop the train almost instantaneously. One of the chief difficulties of the undertaking was the water supply, but that has been obviated by the formation of two very large reservoirs, one at the station, the other near the observatory.

At the meeting of the India Council on Tuesday, a final decision was come to regarding the disposal of the India Museum. The museum does not cease to exist, but will in six or seven months be reopened with additions which will—so it is said—present to the people of this country such an exhibition of the manufacturing and artistic resources of India as has never before been laid open to their view. Beyond this, "most important and self-contained collections in illustration of the Indian building art antiquity, and of the economic mineral, vegetable, and animal productions of India, will at once be established at the great centres of learned and scientific research, and of industry and commerce, in the United Kingdom."

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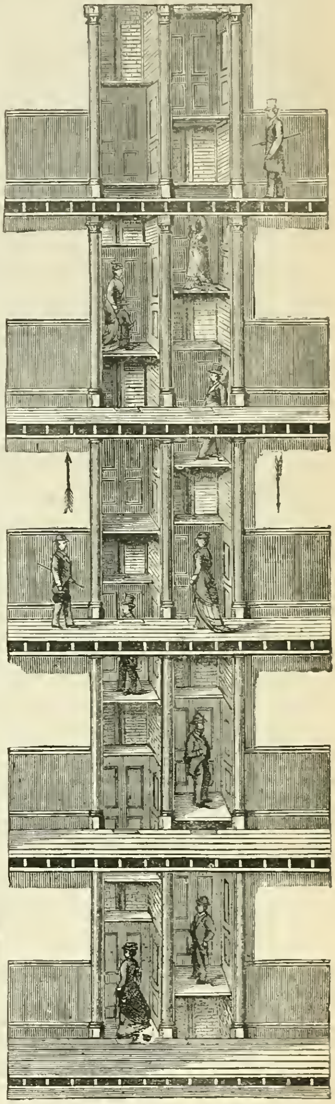

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THE well-known American hydraulic engineer and inventor, Uriah Atherton Boyden, died, October 17, at Boston, Mass., where he had resided for several years. Mr. Boyden was born in Roxborough, Mass., February 17, 1804. His early life was spent on a farm, and in assisting his father in the management of a machine for splitting leather. He afterwards took part in the construction of the Lowell Railway and in the construction of the Suffolk, Tremont, and Lawrence mills. In 1833 he opened in Boston an office, which he occupied until his death. The Nashua and Lowell Railway was built under his direction in 1836-8. For several years he was engaged as the engineer of the Amoskeag Company in establishing their extensive hydraulic works at Manchester, N. H. In 1844 he designed for the mills of the Appleton Company, at Lowell, a turbine wheel, which gave such satisfaction that in a little while that type of wheel was adopted for nearly all the Lowell mills. The Boyden turbines were also widely substituted for the older forms of water-wheels in the best mills throughout the country, and Mr. Boyden soon accumulated a large fortune by his inventions and services. He retired from the practice of his profession some years ago, and devoted himself to scientific investigation, making many inventions in connection with philosophical and chemical, metallurgical, electrical, and other apparatus.

A NEW tie-brick, invented by Mr. Herbert W. Hart, has been submitted to our inspection. It is very simple, but very effective, and by its use the most perfect bond can be obtained, without iron hooping, thus enabling structures to be erected with a great saving in time of skilled labour in plumbing and pointing, and in the time of labour in preparing mortar, and cost of material, as only one-fifth the quantity is required. The builder is also enabled to produce a perfect double-faced wall, whether 9in. or 9ft. By the use of this brick cracking of the work is prevented, and where cement is used in the foundations settling is impossible. The economy effected in skilled labour will, so the inventor says, reduce the cost of buildings to about 10s. per rod.

THE park front of the new Knightsbridge Barracks has now been removed, and the public is enabled to judge of the general effect of one *façade* of this pile of buildings. To say that it is not an improvement upon the wretched collection of dirty sheds which it replaces would, says the London correspondent of the *Leeds Mercury*, be an obvious exaggeration; but as one looks upon the tasteless muddle of red bricks and white stone, which do not even suggest its use and purpose, one cannot but feel more than ever sorry that the Ministry were allowed to carry out their scheme of disfiguring one of our finest open spaces. As regards the architectural features of the building in general, it might be supposed, from the narrow windows, that the idea of a possible siege of the barracks was anticipated, and to this idea all theories respecting light, air, and health have been sacrificed. This doubtless comes of employing a military rather than a professional architect, for it can hardly be supposed that Her Majesty's Commissioners of Works have not at their disposal some qualified person who might have turned to good account so fine a site and so liberal a grant of public money.

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CHIPS.

The chancel of St. Michael and All Angels' Church, Weyhilt, Hants, was reopened on Saturday, after restoration and the addition of a stained-glass window. The work has been carried out under the superintendence of Mr. A. K. Baker, the diocesan surveyor, and the builder was Mr. F. Beale, of Andover.

At a meeting of parishioners of St. Thomas-over-Monnow, Monmouth, held last week, it was decided to restore the parish church at an estimated cost of £600. The report of the architect, Mr. Trew, recommends the provision of dwarf wall and coping between nave and chancel roofs, with chimney, re-covering roof with slates, removing ceiling, and providing stained and varnished diagonal boarding to collar of roof, building in stone a new turret, removing plaster, and refacing outside walls throughout.

On Sunday special services were held at St. Gregory's Church, Sudbury, to commemorate the completion of works of restoration, which have been extended over a very considerable period. Five-and-twenty years ago the church was disfigured by many incumbrances: the western arch was blocked up by a series of galleries, the floor covered with ugly pews of varied shapes and sizes, and the walls, windows, &c., were old, decayed, and dilapidated. By degrees all has been altered. The fabric has been made good wherever defective; the galleries have been removed, the pews replaced by rush-bottomed chairs, the roofs repaired and decorated, and new windows inserted, those at the east and west ends being filled with stained glass as memorials. An organ has also been erected at the east end of the north aisle.

The annual report of the science and art classes held at the Working Men's Institute, Belfast, states that the results of the last session indicate continued and gratifying success; 353 students were examined and the great majority passed. The proportion of first prizes taken has not been so high as in former years, but still exceeds the average of the United Kingdom. The local exhibition of £50 was gained by Mr. James Meek.

The district of Sowerby-bridge is about to be sewered from the plans, and under the superintendence, of Messrs. Utley and Gray, of Halifax.

The National Gallery at Dublin was reopened on Monday after the recess. Several additions have been made to the pictures, the most notable being Maclise's "Marriage of Strongbow with the Princess Eva," which has been presented by Sir Richard Wallace, M.P., and which occupies the entire western wall of the modern room. The marriage is represented as taking place on the field of battle, immediately after the siege of Waterford.

The Guardians of the Cork Union at their meet-on Thursday, Nov. 6th, appointed Mr. M. J. McMullen, South Mall, Cork, as their architect and engineer.

Considerable alterations and improvements have just been completed at Blairmore, Woodberry Down, N. The whole has been carried out under the superintendence of Mr. Walter J. N. Tomlinson, architect, of 13, Great James-street, W.C.

The Brownhills Local Board have instructed their surveyor, Mr. Siddalls, to prepare plans for new public buildings, &c., proposed to be erected on an acre of land near the railway station; the accommodation to be provided consisting of offices for surveyor, inspector of nuisances, collector and clerk, board-room and ante-room, residence for surveyor, stabling, &c. The board are also about to memorialise the Quarter Sessions to hold a Petty Sessional Court at Brownhills, in which case the board intend building an assembly-room, which can be used for the magistrates' meetings, &c.

On Wednesday at the annual meeting of the Royal Scottish Academy, held in Edinburgh, Messrs. Robert Anderson, J. Z. Wingate, and J. C. Noble were elected associates in room of Mr. Gavin, Mr. Cassie, and Mr. Docherty.

The Liverpool Town Hall has been redecorated from the designs of Mr. H. B. Bare, of Liverpool, under the superintendence of Mr. Thomas Shelmerdine, jun., the corporation surveyor. In the recessed panels over two of the doorways are decorative paintings, the second and third of a series to illustrate the "transmission of music," the subjects being arranged as follows:—1, Pan instructing Apollo; 2, Apollo instructing the Muses; 3, The Muses instructing Orpheus; 4, The Nine Muses. Nos. 1 and 4 are intended to fill the corresponding panels on the opposite side of the room at some future time. These subjects have been ably worked out by Messrs. Shrigley and Hunt, of Lancaster and London.

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MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY.—British Archæological Association. Papers by Rev. S. M. Mayhew on "Antiquities of the Isle of Man," and by Thos. Morgan, F.S.A., on "Results of the Yarmouth Congress," 8 p.m.

Society of Arts. Opening address of the 126th Session, by Lord Alfred S. Churchill, 8 p.m.

FRIDAY.—Architectural Association. Presidential Inaugural Address, 7.30 p.m.

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or, 19, Parliament-street, London.—[ADVT.]

Trade News.

WAGES MOVEMENTS.

WAGES AND PRICES IN AMERICA AND GREAT BRITAIN.—Reviewing the information furnished by the American consular agents in England, with special regard to the influence of trades unions, Secretary Evarts says:—"A few years more of strikes and disorganisation in England, and it may be doubted whether any compromise between the employers and employés will restore to that country her manufacturing supremacy. As capital will not remain idle, nor permanently in unprofitable investments, it may be expected that English capitalists will seek new fields for investment, such as the transfer of the cotton manufacture to India, which may be said to have already begun. Under such circumstances nothing will remain for the British working men but emigration. Thus, if they drive capitalists away they themselves must go.

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THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 21, 1879.

THE DECORATION OF PUBLIC BUILDINGS.

THOUGH we have not yet emerged from what will to a future generation appear as a great building epoch in our history, there can be no question that the latter half of the nineteenth century will be looked back upon as essentially a building age; and one of extraordinary activity and architectural progress, not confined alone to the metropolis, but equally manifest in Liverpool, Manchester, Birmingham, and all our chief provincial towns. Cities, which for generations have been content with the town hall, the exchange, or the market built by their ancestors in the period, perhaps, of the Stuarts, have found with the increase of trade and the vast numerical gain in population, that the old buildings were wholly inadequate to modern requirements, and magnificent and stately edifices have sprung up everywhere to replace them. Nor have our citizens been content with the mere erection of the splendid buildings they have founded, but in many cases very considerable sums of money have been expended in decorating and enriching them; the designs for these works being furnished by artists of eminence both in this country and abroad.

It is true that we are still far from the possession of a school of skilled historical painters, whose master-pieces might fitly adorn the numerous public buildings which are rising around us; neither have we yet made choice of the fittest medium in which to execute the designs we destine for the adornment of our halls and galleries, and the reason of this is, we think, not far to seek. We do not trouble ourselves enough to make known our requirements, and we take no steps to learn what is being done in other countries in the decoration of buildings of importance. We do not even endeavour to study what was done in the best periods of the past, but we blunder blindly on in the way we have commenced, and with facilities as concerns the materials, for obtaining permanent and lasting masterpieces for the decoration of these great edifices; with opportunities which far surpass those of the artists of Corinth, of Rome, or of Mediæval Italy, we seem in a fair way to employ our painters upon works which will have become lost to us ere the close of the century in which they were produced.

The unrivalled occasion for art of the highest character, executed in the most durable of materials, which was afforded by the rebuilding of the Houses of Parliament, seems to have been wholly lost. Other great buildings are being decorated upon the same, or a nearly similar plan, and we appear to take no heed of the grave lessons past experience should have taught us. Many will say: "Surely the public competition for the frescoes of the Houses of Parliament must have brought the most able men into the field, and the careful investigation which preceded the execution of the work must have placed our artists in possession of all that it was possible that science could reveal respecting the durability of the colours they employed, and the materials with which they worked!" The best answer, taking a far more humble illustration, is that, notwithstanding every care in the selection of a suitable building stone, and in spite of all that science could teach us, a material was chosen which seems peculiarly ill-adapted for the nature of the structure itself; while the life-long labours of such artists as Maclise, Ward, and Dyce are in danger of vanishing from the walls which they adorn. The causes of failure in fresco-painting; the nature of the materials best suited to withstand the influences of our treacherous climate; the conflicting claims for superiority of water-glass and encaustic or wax medium; the possibility of working on the walls themselves with enamel colours; the advantages of mosaic work or marble inlay, and the employment of ceramic decorations;—all these are points concerning which it seems a reproach to us that there should be any shadow of doubt. Why, if mosaic work is found to be suitable and lasting as a method of architectural decoration, are four thousand pounds being paid to Sir Frederick Leighton, the President of the Royal Academy, for the execution in a species of wax medium of his noble lunette of "The Arts of War," on the walls of the New Court of the South Kensington Museum? What is the Professor of Chemistry at the Royal Academy about? Can he give us any good account of his stewardship? Why are we exposed to such constant risks of failure, when we ought, at any rate, to be told by scientific men the nature of the principles by which we should be guided in our work? What is the use of decoration at all on the walls of our museums and our municipal and civic buildings, if it is impossible to predict how long these works may last?

What a noble mission it would be for the Great National Art Institution at South Kensington, which has done so much for Art, and has so much still to do, if with her science laboratories and her art professors, she would inquire into and examine this question for us, and formulate a few certain and reliable laws.

Since the loss of her famous chief, South Kensington has done but little for Art, and stands in danger of being utterly extinguished. Sir Philip Owen, the successor of Sir Henry Cole, and Mr. Poynter, who is supreme in art matters, surely will not accept the position of pottering feebly on in the rear, instead of in the van of every art movement. The mission of the Science and Art Department is, it is true, first to educate; but secondly to initiate art work; not to limp lamely after other institutions, and to remain with folded hands waiting for more liberal masters, or more encouragement on the part of the public, to be up and doing.

It is a favourite idea of those who take a delight in abusing every institution for the extension of State aid to art and science, to describe South Kensington as the chosen haunt of a nest of opportunists and schemers anxious only to benefit themselves under the plea of promoting the spread of the knowledge they were called upon to foster and promote. To critics of this type the doings of the Royal Commissioners and their protégés; the efforts of the Science and Art Department; and all those other institutions which have made South Kensington their home were jumbled together promiscuously, and whatever was accomplished was attributed to "official jobbery." There has been of late a great falling off of such criticism, which merely implies a period of great inactivity, for where nothing is done, there can be nothing to blame. The Royal Commissioners appear to be bent on self-annihilation, or they have determined to wait until public clamour goads them into some measure or other in fulfilment of their trust. Perhaps their great quarrel with the Horticultural Society takes up all their time, or they are still devising plans for spending the money they may one day realise by the sale of their property as building land. All this, moreover, in happy unconsciousness of the coming storm, when the basket of eggs will be upset, and a more able administration of their valuable estates will be imperatively called for.

This is, however, a sad digression from our subject. We were about to enforce on the Museum authorities the urgent need of severing themselves from any possible connection in the public mind with the many moribund institutions by which they are surrounded, and the necessity of retaining their place in public favour by continual exertion and activity. Let them turn their attention to a few of the great art questions concerning which definite information is required, and let them show themselves alive to art-progress.

To point out only one way then in which real service might be done to artists. Let them take up this very important investigation—the decoration of our buildings. It will not come to them as a new study, for more has been done at South Kensington; more real, honest work in fresh directions; more new processes applied, and more old arts revived during the last twenty years, than in any other art institution in Europe. But it is not enough merely to begin a little bit of this kind of work, and to make a few desultory trials of that; to cover one wall with mosaics and another with frescoes; to coat one ceiling with enamelled iron and a second with enamelled terra-cotta; to begin with sgraffito one day and to discard it for majolica the next; to enable her students "to become familiar with these processes" forsooth. We want to know something concerning the relative merits of all these various modes of working; the positions for which they are respectively best adapted; their advantages, and their drawbacks; and their suitability or otherwise for artistic requirements. Let us have an exhibition, if you will, of the chief modern works of public decoration; the cartoons of Mr. Poynter and Sir F. Leighton, of Mr. Armitage and Mr. Watts, of a host of other eminent men, who have laboured during the past twenty years in decorating in various ways some of our most important buildings. A collection merely of the sketches or first studies of these and many great Continental designers would be of the utmost value to us, and a careful report into the systems they have adopted, and the grounds upon which their methods are based, might lead to a new departure in works of decoration, and be a source of infinite gain to art. If we are to enrich our public buildings with the best art we can command, it is a sorry compliment to our artists to withhold from them the knowledge of how most surely to render their works imperishable. If this can be done (and who shall say it cannot?), it would be a noble work for South Kensington to accomplish, and we offer them the suggestion as one out of the many great questions they might endeavour to solve.

THE RUSKIN COLLECTION OF THE DRAWINGS OF SAMUEL PROUT AND WILLIAM HUNT.

ONE of the choicest collections of pencil and water-colour drawings it has been our fortune to see lately is now open to the public at the Fine Art Society's gallery, New Bond-street. The drawings are by Samuel Prout and William Hunt, two of the greatest delineators of their kind of the present century, and these have been collected and arranged by no less an authority than Mr. Ruskin. It must be readily admitted that, whatever imperfections there are in the technical qualities of Prout's drawings, such as his inaccurate perspective, his work is unquestionably to be ranked among the most truthful and conscientious of the age, and no one with a spark of interest in the early history of the school of which he was so conspicuous a member will fail to derive profit from the exhibition. All those who can admire the unaffected and truthful in architectural drawing will especially take a pleasure in examining carefully the work of this indefatigable artist. Prout, as Mr. Ruskin says, in his interesting preface to the catalogue of this loan collection, "drew every lovely street in Europe, without troubling himself to learn a single rule of perspective, while Hunt painted mossy banks for five-and-twenty years without ever caring to know a sphagnum from a polypody." But although this remark is very true, there is still an accuracy about the proportion and details of Prout's drawings of Continental architecture that charms us. Prout drew entirely with pencil, and had not recourse to the numerous expedients of modern artists, while his colouring was exceedingly simple, his palette being limited to ochres, browns, and cobalt blue. Let us first look at a few of the charming pencil drawings Mr. Ruskin has brought together. Seventy of these have been chosen to illustrate the artist's manner and the course of an old-fashioned Continental tour, beginning at Calais and ending at Rome. Take Calais, a small sketch charmingly made on grey-toned paper, lightly tinted. Of this sketch Ruskin says, in one of his vivid notes, it is of the "best time and highest quality. . . . You see the size of the steamboat of the period. You may trust Prout's measure of its magnitude. So also of belfry, lighthouse, and church, very dear all to the old painter and to me." The architecture, observes Mr. Ruskin, is truly told. The view of Abbeville, with the Tower of St. Wulfran, is also described as of the artist's best time and manner. No. 5 is an extremely elaborate sketch, but Mr. Ruskin says of it:—"Of the late time, but not in the highest degree good. The chiaroscuro of the pinnacles evidently caught on the spot, but not carried through the drawing rightly, and the whole much mannered. Precious, however, for all that!" We find ourselves before a sketch of "Evreux" (No. 9), a fine pencil drawing on grey paper. We are quite of Mr. Ruskin's opinion that this is a perfect sketch. The artist's truthfulness in scale and proportion is well commented upon. We are told in the notes:—"No architect, however accurate in his measurements—no artist, however sensitive in his admiration—ever gave the proportion and grace of Gothic spires and towers with the loving fidelity that Prout did. . . . Observe first, everything in grace of form depends on truth of scale. You don't show how graceful a thing is till you show how large it is; for all grace means ultimately the use of strength in the right way, moral and physical, against a given force." "Strasburg Spire" (10) is another exquisite drawing, and Mr. Ruskin, in his notes, makes a very just critical remark in regard to the objectionable nature of the iron-like spire, which Prout has cleverly disguised by an expedient of introducing, "with all his might the flutings in the pilasters of the near well," and thus conquering, in Mr. Ruskin's words, "an objectionable character in the main subject by putting more of the same character in something else where it was not objectionable." The effect is all that can be desired, and the tower loses its rigidity of upright lines entirely, by the broken drawing of the lines themselves. "Lisieux" is a pleasing reminiscence of the quaint old town. The drawing represents an old street with rich fancy-timbered fronts of florid 14 or 15th-century work. Ruskin calls it a hurried and fatigued drawing, and it certainly is wanting in ease and finish; the detail in some parts is omitted, or merely outlined. We agree with the remark also, that this street is a wooden street in a stone style, which has rather puzzled Prout, who could work better in the representation of wooden buildings. The doorway looks certainly more like stone than wood. The water-colour drawing (13) is very rich in the brown transparent tints and the gray shadowing over. The drawings of "Antwerp," "Ghent," "Augsburg," "Brunswick," "Dresden" (18—22), are all of them intensely interesting sketches of Continental cities, exhibiting many of the quaint beauties of the architecture rendered with strict fidelity to detail. The tinting to the apse of Augsburg (20), with the ornamental gable near, and the partial "stumping" of many of the pencil sketches, as in No. 21, are characteristic of Prout. "Worms" (31), shows an exceedingly nice Romanesque apse, with some arcading over the windows very careful and correct in detail. The staircase, St. Maclou, Rouen (17), a very favourite subject of the young architect, is a highly-finished pencil-drawing. Mr. Ruskin says of it:—"Almost unique in the elaboration of the texture in marble pillar and effect of distant light, showing what he was capable of in this kind"; but both, he observes, "were mistakes, as it does not in the least matter to the staircase whether the pillar is smooth or the window bright." "Ulm" (36) is shown by both a pencil and a water-colour drawing, in his best style. The chief interest, architecturally, is the unique spiral cross. "The latter shows," says the catalogue, "the little interest he took in copying for the Exhibition, knowing that the British mind was not to be impressed by proportion, and only cared for getting things into their frames." "Antwerp" (19), and "Domo d'Ossola" (47) are highly praised by Mr. Ruskin. Of the first, he says it is "altogether magnificent;" of the last, that it is "one of the most exemplary in the room for intense fidelity to the place and lovely composition of living groups." The corbelled balcony and the figure in it, certainly are the most charming hits. The fine blue effect of the distance adds contrast to the rich warm brown of the balcony. No one can disagree to Mr. Ruskin's remark, that the southern subjects chosen by Prout are much more restricted in expression than those of North France and Germany, of which he selects eight drawings, Nos. 9, 10, 19, 47, 48 65, and 71, as estimable and unreplaceable. He says: "Prout was quite unable to draw the buildings of the highest Italian school, yet he has given the vital look of Italy in his day more truly than any other landscapist, be he who he may; and not excepting even Turner, for his ideal is always distinctly Turnerian, and not the mere blunt and sorrowful fact." We certainly feel the force of these very sensitive remarks in looking at the drawings of "Verona" (49 and 50), one in pencil, and the other in water-colour; and in the drawings of "Venice," showing the Ducal Palace, Nos. 56, 57, 60 (the last lent by the Right Hon. Lord Coleridge). There is a want of poetic feeling in the drawing of the architectural detail, which Turner comprehended and expressed; there is a stiffness apparent. We cannot resist again quoting an applicable passage from Mr. Ruskin's preface as regards this point. "Turner saw things as Shelley and Keats did; and with perfectly comprehensive power, gave all that such eyes can summon, to gild or veil the fatalities of material truth. But Prout saw only what all the world sees, what is substantially and demonstrably there." The "Place of St. Mark's, Venice," is tinted in cool colours, and hardly characteristic of the glowing spirit other painters have given to it. The water-colour drawing of Verona (61) is still a remarkably vigorous and finely-coloured subject, the dark brown bridge and campanile in shadow, the balcony and blue sea, are full of tone and colour. Mr. Ruskin asks why "Prout, practical among all manner of Cornish and Kentish boats, could not for the life of him draw a gondola, and never gave the grand Adriatic fishing-boat with its coloured sail." "St. Michael's Mount," Normandy (58), is far more characteristic, and shows the artist's appreciation for local truth. "Kelso" (73) is interesting as showing Prout's method of tinting in simple washes. Here the crossing of the fine old ruin is shown in a half-finished work of sepia of a cool tint, the smaller shadows being put in with a browner wash. The drawing of "Fountain of Egeria" (72) is also of interest in showing the manner he drew foliage, the masses being drawn in outline. "Ypres" (80) shows a finely-drawn bit of domestic architecture. "Rubens' House at Antwerp" is a singularly well-drawn piece of Renaissance, and "Caen" is also extremely effective as a pencil sketch. We can only enumerate further a bold and richly-coloured drawing, "Wreck of an East Indiaman," full of rich browns and madders, with the heavy purple sky and the majestic lines of the bow of the old vessel. One peculiarity in Prout's drawings we have remarked before, but which does not appear to have been observed by Mr. Ruskin, is the want of fulness in the curvature of his pointed arches, and the bluntness of the lines as they reach the apices. We notice this in the little Interior of St. Julien, Tours (101). His traceries and arches show the want of perspective which mar some of the finest drawings of this master. As regards his drawing of tracery, Ruskin says "No one had ever drawn the traceries of the Ducal Palace till I did it myself," and he puts Canaletto and Turner in the same boat as Prout in this deficiency. In the supplementary drawings by Ruskin we especially note "Calais," a very spirited sketch, half-tinted; No. 105, the Ducal Palace; 108, "Chiaroscuro," a study of a pillar of the Piazzetta; 106, Foliage of the S.W. angle of Ducal Palace; No. 12 and No. 113. We commend the student interested in the drawing of sculptured surface to read the sensible remarks of Mr. Ruskin under this head, appended to the catalogue at the end of Supplementary Drawings.

We have little space left to say much on Mr. Hunt's beautiful series here brought together. In his preface to this portion of the exhibition Mr. Ruskin impresses upon the visitor what he has brought this series here for, namely, to show what real painting is, as distinguished from daubing, from chromo-tinting, paper-staining, tray-varnishing, &c. We note "The Eavesdropper" (121) and the head of "The Wanderer" (120), as both examples of careful painting of figure and face. "St. Martin's Church" shows the portico, a well-drawn subject, the drawing being in brown ink, the colouring simple and transparent, with grey and transparent shadows. "Black Grapes and Strawberries" (129), "The Grapes" (130), and "Quinces" (131) are highly-finished pieces of painting. The stippling is done in opaque white, which renders the rotund forms of his fruit almost too painfully realistic for us. Mr. Hunt's earlier manner was a charming transparent mode of colouring, but his fruit pieces here shown, and his later works, were in thick pigment. The "Flowers and Fruit" (142) is highly spoken of by Mr. Ruskin, who goes into raptures over the butterfly in the drawing. The "Herring and Pilchard" (144), the "Pine, Melon, and Lemons" (143), "A Bird's Nest" (47), "Lilac and Nest" (48), are, to us, more pleasing than some which Mr. Ruskin admires, on opposite principles. We are bound to say, however, that the rendering of nature, in all its intensity and truthful literalness, was carried by this artist to almost an extreme and painful degree of finish, and that we lose much of the conception and refinement a less realistic treatment possesses.

LONDON SCHOOL BOARD EXHIBITION OF DRAWINGS.

WE have for some time past watched the progress made by the scholars and pupil teachers of the schools under the London School Board, and each annual exhibition has afforded us stronger ground for the belief that the Board Schools, by taking up elementary teaching in drawing, are increasing their usefulness, and extending their influence among the classes who frequent them. The present exhibition of drawings, opened at the beginning of this week at the offices of the Board, while showing no striking art-work, is satisfactory to us as indicating the teachers are proceeding on safer ground. In our first notice of these drawings we hinted the undesirability of giving pupils opportunities for copying subjects of a questionable kind found in the pictorial papers; this year there is, with a few exceptions we shall point out, a considerable improvement in this respect, the schools generally confining the attention of their pupils to a systematic series of graduated examples in outline, freehand, and geometry. Map-drawing, of course, as we have observed before, is both a good exercise to train the eye as well as a very desirable aid to the teaching of geography, and there are numerous specimens to be seen. Flowers, for obvious reasons, enlist the interest of girls, and within certain limits cannot be objected to; but we certainly object to coloured representations of bouquets, to pictures of Zulu warriors, and "British Pets." We are glad to find the larger district schools, such as those of Southwark, Lambeth, Greenwich, Chelsea, Hackney, and Finsbury, furnishing specimens of drawings of a suitable kind, and within the meaning of the Government Art regulations. Finsbury, for example, sends from the Poole's Park Boys' school some creditable shaded bosses, geometrical diagrams, and freehand ornament; the girls' school contributes a few careful outlines of Greek ornament. From the Caledonian-road school several creditable work in perspective and geometrical diagrams are sent. We could well spare some of the pencil and chalk landscapes that have been contributed from Poole's Park school. Keeton's-road school, Southwark, is well represented. We observe a boy's head drawn in chalk exhibiting much vigour and good shading, and some excellent outline ornament by the girls. The Farncombe-street school is noticeable for some clever perspective drawing, a hexagonal prism and skeleton cube; and the girls' school comes out with credit. The Monnow-road contributes a few pencil flowers (it would be wise to avoid tawdry crosses strewn with coloured flowers), and Holland-street some ornament, both commendable; but we hope the Nelson-street course will exclude such absurd caricatures as the "British Pet." Lambeth is a large district. We pick out a few schools at random, and find a general improvement. The Tennyson-road, Bolingbroke-road, Church-street, Westmoreland-road, are all represented by carefully drawn freehand outlines of ornament, some examples of geometrical drawing and perspective, and a few landscape subjects. The Church-street school in the boys' division sends two large crayon drawings, shaded, of a horse's head and also of a donkey's, both clever and creditable to the pupil (J. Shooter). We are sorry the boys at Bellenden-road school are not better engaged than in drawing hideous pictures of fighting Zulus. The same school exhibits other not very choice specimens of perspective, one a house front; certainly the models need a little more selection. Gipsy-road school contributes a number of similar works, though with much that is good. To these and others we would say, Discard the picture copy-book, as drawing of this sort is, in our opinion, more pernicious than useful. Greenwich generally contributes well; this year the drawings are fairly up to the average. Thus we note from Clifton-road school a careful example of perspective (G. E. W. Horton) and from Hugh Field's girls' school a vase. The Rendlesham-road school sends a clever drawing of girl with kitten, and another crayon subject, a woman with a child on her back. Bloomfield-road school is creditable in the work exhibited, particularly the ornamental freehand by girls. The design for book-cover, and tulip drawings are hardly, we think, the kind of work for elementary instruction. Sydenham-road sends a few well-drawn outlines from the girls' school, so also the Clifton and Grove-road schools. The Portobello, Blechynden, Queen's-Gardens, and other schools in the Chelsea district show excellent work; the freehand outline, the geometry, and physiological studies indicate considerable improvement in the more useful kinds of drawing. We note, also, one or two painstaking drawings, illustrating projection, from William-street school. Among other establishments we note the Buckingham-gate school, Westminster, as exhibiting too many chalk and pencil copies from prints, such as drawings of "Dignity and Impudence," Landseer's well-known picture; the Hackney schools of Turin-street, noticeable for some good freehand, and of Wilmer-street, for some ornament by the girls; the Marylebone schools, Netley-street, for outline of ornament; Haverstock-hill, Mansfield-place, and Cromer-street, for similar work, also the Tower Hamlets. From the latter, the drawings do not appear to be equal to those on previous occasions. We notice a drawing of a picture "A Cup of Chocolate, Sir," from St. Paul's school, that would have been better if it had not been sent. Of course these copies are not supposed to be competition drawings, but the recreation work of the school, and we must therefore take them as exhibiting a large amount of undeveloped talent.

It would be desirable, we think, if possible, to limit these exhibitions to the works of students who had passed competitions in their schools, for then we should have a more select number of works. As at present constituted, these annual collections contain drawings of every degree of merit. Many of them are not worth hanging, while the creditable works are mixed with the inferior drawings in a hopelessly confused manner. A dozen specimen drawings from each school, comprising the different grades, would be quite sufficient for the purpose, both for inviting comparison and stimulating effort. We should, at least, eliminate the drawings of the puerile and ridiculous kind we have pointed out, as we think it would be only fair to the schools which are doing good work to find themselves associated in their efforts with others who have really derived benefit from correct art instruction.

WORKS IN HAND.

SEVERAL works of more or less architectural interest are to be seen in the extensive workshops of Messrs. Farmer and Brindley, of the Westminster Bridge-road. Remarkable alike for its rich material and design, is a splendid mosaic pavement for the vestibule of Eaton-hall, the new residence of the Duke of Westminster, and which has been carried out from Mr. Waterhouse's design. An additional interest is imparted to this work from the fact that the porphyry and marbles comprising the pavement have been obtained from the remains brought over with the Elgin marbles, at the beginning of the present century, and partly from the antique fragments found in Rome. The red and green fragments are therefore real Egyptian, and these make up the chief part of the design; the yellow have been brought from Rome. The value of these three colours is enhanced by the fine Greek marble that has been used as a ground to the design. It would be impossible to convey by description in words the extremely rich effect of the combination of dark red, green, and yellow. The hall for which the pavement is intended is about 30ft. square, and the design consists of a centre circular panel of deep red, or maroon porphyry, with small discs of the same material at the corners. Round these is a bold border enriched with diagonal patterns, and with intersecting circles of coloured marble. The large centre and corner discs are encircled by lines or borders of porphyry, and the design is essentially of Late Roman or Byzantine character. The tesseræ are in parts very small, and are chiefly of square, diamond, hexagonal, and triangular shapes, composing bands of geometrical pattern in the manner of the *opus tesselatum* or *Grecanicum*, of old mosaic. The pieces are laid in slices of marble about half an inch thick, and the variety in the veins produces a rich appearance. The pavement resembles the kind found in Italian churches, dating from the time of Constantine, and the cubes are put together with large joints. In execution we can confidently speak of the thorough and artistic manner in which the tesseræ have been worked to the design, and the care bestowed in arranging and contrasting the natural vein of the pieces, and great praise is due to the artists and also to the workmen engaged by Mr. Brindley on this work. The design for Dean Ramsay's memorial lately erected in Princes-street, Edinburgh, has been executed by this firm. It consists of a plain cross with circle filling up the angles between the arms, the latter enriched by a guilloche. On the front side are a series of square bronze panels. The extreme end of the upper arm has the subject of the "Ascension," the arms on each side the "Incredulity of St. Thomas," and "Christ Appearing to Mary Magdalene." The intersection has a panel representing the "Resurrection," while the lower shaft has three panels, subjects—the upper one, "Giving Drink to the Thirsty," the centre, "Feeding the Hungry," and the lowest, "Clothing the Naked." On the other side, the panels represent the Flagellation, the Betrayal, the Crucifixion in the centre, besides other Scriptural subjects. We notice in another part of the workshop several memorial slabs, or gravestones, one of red polished granite, on grey base, from a design by Mr. Gilbert Scott. It is coped, and has a cross sculptured in relief upon it of a simple and very effective kind; the stem is enriched with leaves, and a quatrefoil head is introduced. We note also a reredos for a Roman Catholic Church, from Mr. Purdie's design, in which Mexican onyx has been introduced. For the Natural History Museum, Kensington, we find modellers and sculptors are employed upon two or three emblematic figures in marble, and our attention is directed to a medallion or profile in relief of the late Sir Gilbert Scott, intended to be placed in Edinburgh Cathedral. But the admirer of woodwork and carving will be as well rewarded by inspecting the upper workshops of the firm. Here we saw a large number of joiners and carvers engaged upon the new choir fittings for Canterbury Cathedral, opened on Tuesday last. The oak desk front, from a design left by the late Sir Gilbert Scott, is a particularly fine and ably-executed piece of open traceried work, quite Decorated in character, and in every detail breathing its design. The carving, and the arch mouldings and tracery, the shafts with their rich capitals full of small members, are specimens of workmanship that could not be surpassed for the painstaking labour and artistic feeling bestowed upon them. The bishop's throne, the altar table, organ case, sedilia, have also been executed by this firm.

In another class of art workmanship we find a few specimens of metal work, in the new showrooms of Messrs. Henry Hardman and Co., of King William-street, Strand. One or two of the altar crosses in brass, engraved and enamelled and set with stones, indicate a decided improvement in taste upon the very florid work executed some twenty years ago. The plain moulded bases of the lecterns and candlesticks also strike us. We notice a lectern with twisted stem, enriched by knop and with a plain circular base, well suited for a small church. Some of these are very rich. The altar candlesticks, with plain cable and twisted stems, crystal set knops, are excellent specimens; many of the designs exhibit the true spirit of Mediæval workmanship. An ebony and brass pair of candlesticks we saw drew our attention. Of the many beautiful designs in the way of chalices we must notice a silver-gilt one, of Early Gothic design, from a sketch by Mr. Burges; it is set with crystals and aquamarines in the knop and foot, and the bowl is of silver gilt. Another and very unique chalice of Early type, from the design of Mr. Street, R.A., is of silver. The bowl is quite plain; the stem is enriched by a bold knop of silver, and the foot has a series of niello enamels, with the cross and evangelistic emblems round it. A richly-executed tabernacle door in metal gilt, worked to a late 14th century design, with engraved centre and the frame set with crystals, is also on view. Messrs. Hardman, whose silver-work enjoys a high reputation, have an equally striking display. We notice, among other things, a card-salver with enamel centre illustrating an old English ballad; the lines of which are engraved round the border. The design is marked by extreme simplicity, and the figure of the knight in the centre is admirably drawn. Among other examples of ecclesiastical work may be mentioned a few highly-ornamented monstrances, with enamelled centres set with rich stones, some admirable gas brackets and suspending Argand burners with ventilating tubes. Messrs. Hardman's showrooms are worth a visit from all who prize good design and workmanship in metal.

Mr. Robinson, of High Holborn, whose woodwork and carving are always worthy of praise, has now in hand several interesting fittings for churches. In a recent visit we made to his workshop we noticed an oak litany-desk for a church in Yorkshire, we believe from a design by Mr. J. O. Scott. The upright framed part is pierced by three arches, and the elbows of standards are boldly carved. The design and workmanship are excellent. From a design by the same gentleman we must mention the new chancel screen for Orchardleigh Church, which is now being executed by Mr. Robinson. The design is Geometrical Decorated, the upper portion having a series of open traceried arches of rich design, supported on circular pillars with moulded caps and bases. It is surmounted in the centre by a carved cross. Mr. Robinson is also about to carry out the restoration of a fine Perpendicular screen for the church of SS. Mary and Andrew, near Uckfield. The altar railing for St. Mary, Totness, from a design by Mr. J. Oldrid Scott, will be a fine piece of traceried work of a Late character, in which the carver's work is seen at its best. Among other examples of workmanship we observe one or two presses for Kingstone church, near Weymouth, now being executed from Mr. G. E. Street's design. Both in detail and feeling Mr. Street's work offers a strong contrast to that by Mr. Scott. In the former we observe a vigorous, and, if we may call it, early muscular treatment; in the latter, a more inflected manner, cuspated to a florid degree, recalling the style of the late Sir Gilbert Scott. Mr. Street's presses are remarkable chiefly for the piquant, and striking, mouldings which form the cornice above a kind of billet-moulding, and the finish of the doors of the front. These are hung folding, with the upright joints of the oak boards moulded on the face in a style seldom seen in modern work. The wrought hinges are of pleasing design. Perhaps the most important work Mr. Robinson has in hand is a very handsome and elaborately-carved organ-case of oak, for the church of St. Mary-le-Strand, from Mr. Blomfield's design. The framing comprises a lofty centre and side wings, the open framing being ornamented at the angles by richly-carved and pierced brackets. The style may be designated Renaissance, and the architect has thoroughly mastered the spirit of the style. We lately spoke of the same gentleman's able adaptation in another City church, that of St. Mary-le-Bow. Mr. Robinson is also engaged on the stalls and pulpit for St. Mary's, Lewisham, and has lately completed the organ-case for Christchurch Cathedral, Dublin, and the new seating for the Greek church, Bayswater.

For art furniture the show-rooms of Mr. W. Watts, in Grafton-street, are worthy a visit. Mr. Watts' collection is not confined to one particular style of furniture, but comprises Gothic, Jacobean, and Anglo-Japanese designs. We may here chiefly note the latter—a style that lends itself more freely to the modern house than either of the former styles. One out of many specimens of cabinets struck us for its simplicity, albeit its upper part is heavy-looking. It was a hanging tablet executed in mahogany, simply oiled, with some exquisitely painted panels of birds, the spirit of the whole design being Japanesque. The painted panels were executed by Mrs. E. W. Godwin. It is called the "Beatrice cabinet," and has three lockers. A larger cabinet in mahogany, with latticed openings and curtains, from the design of Mr. Godwin, is a pleasing contrast to the dark ebonised furniture that suit only a few well-lighted rooms. We admire, for its truly artistic outline and unique mouldings, the chimney-piece sent to the Paris Exhibition. There is no quaint grotesqueness or fussiness of manner in the design; every part is quietly treated. The ends of the chimney-piece are splayed, and contain shelves for china. The brass blower, stamped with a pretty pattern in relief, and the buff tiles in front, the joints of which are concealed by cross bars of brass, produce a pleasing homely effect. Above the mantelshelf the background is painted with conventional cloudings. We do not like the extreme length of the standard ends. They look a little too freakish. One of the specialities in Mr. Watts' show-rooms is a small painted deal over-mantel, which can be fitted to any room and be made to correspond with the prevailing colours. It is a simple mirror, with shelf and side brackets for bric à brac; the centre or mirror part is carried up and finished by a cornice relieved by a leaf enrichment. We are informed this pleasing arrangement can be fitted for about £7. Between the shelf and mantel-board there is a space with three panels at the back; these could be filled with emblems or painted subjects. Among other objects we must notice a few admirable chairs and tables, a bachelor's washstand and dressing-table, already illustrated in our pages, and a very sensibly treated wardrobe in pine with painted panel.

LEGAL DECISIONS RELATING TO BUILDINGS.

We have often thought it would have been a good plan to arrange in something like categorical order those cases relating to buildings, and the rights and liabilities of architects and builders, for our guidance. In searching for cases and precedents we have been compelled to wade through volume after volume of the Building News, or to refer to legal treatises themselves in various branches for a recital of cases. Mr. Edward Stanley Roscoe, barrister-at-law, and an Honorary Associate of the R.I.B.A., has at last to some extent relieved us of this irksome labour by the publication of a book * containing a carefully compiled digest of cases relating to the construction of buildings and to the liability and rights of architects, surveyors, and builders. The Digest contains all the recent cases which have been decided either directly or indirectly bearing upon the profession, and the architect and builder will each find some point or decision that may be of interest to him. We are sorry the decisions bearing upon cases arising out of the Metropolitan Act have not been introduced; but they have been purposely omitted because they have been treated in other works. The appendix contains some very useful matter, such as the precedents of pleadings, the forms of agreements and leases and conditions of contract, as approved by the National Association of Master Builders and the Council of the Royal Institute of British Architects. We also find the schedule of rules for professional practice and charges as published under the Institute's sanction. Prefixed to the book, which is of handy size, is a table of cases and an index, though the matter is also arranged in alphabetical order. Each decision, as for instance "Authority of Architect," "Building Lease," "Certificates," &c., is first clearly stated in large type with the references to Law Reports, after which, in many instances, are notes by the author further elucidating it or the law of the case. The constantly recurring questions we receive relating to the architect's powers and his liabilities as agent of the employer, show the value of a list of decisions of this kind. The other day the question was put in our pages, whether an an architect who had ordered grates and chimney-pieces for an employer's house was liable for them in case of the failure of his client: from the ruling cited in Mr. Roscoe's book he is clearly not liable, as the architect is the agent of the employer for all purposes connected with the structure. Our author says "When an architect is employed merely to prepare plans, he can scarcely be considered as an agent at all, for he supplies a certain thing for a certain sum; but since, as in general, architects have more to do than merely supply plans, they become agents for the building owner, and fall within the class known as general agents, that is, agents who have authority to act in a certain character, as distinguished from special agents who have a special authority to do a particular act. An agent of the former class can bind his principal by all acts within the scope of his employment as against third parties, although the employer may have privately limited his authority." Architects are, therefore, considered as general agents; but the difficulty is to decide in a particular instance whether a certain act comes within their scope. There is a general belief, we know, in the profession that an architect has authority to order quantities, and that the employer is bound to pay the surveyor's commission. As we have previously said, this authority is very doubtful. Mr. Roscoe, replying to the question, says: "This, apart from any specially expressed or implied agreement between an architect and his employer, is a point which cannot at present be decisively answered in the absence of any

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* A Digest of Cases relating to the Construction of Buildings, &c. By Edward Stanley Roscoe, barrister-at-law, H.A.R.I.B.A. London: Reeves and Turner, Chancery-lane.

authoritative decision on the point." It is true that the custom of the profession assumes an implied authority to employ a surveyor to take out the quantities, but such custom must be proved in all cases. The reader may be referred on this subject to the following cases: "Moon v. Guardians of Witney Union," 3 Bing. N. C. (1837); "Taylor v. Hall," 4 Irish L. R. (1869). One or two important cases are mentioned having reference to the amount due to the contractor, which we may quote in the author's own words: "Where an architect is, by the contract between the employer and the builder, to determine the amount due to the builder, and such architect has given to the employer an assurance that the cost of the work shall not exceed a certain sum, the architect does not, in the eye of the law, possess the unbiassed mind which will enable his decision to be just and conclusive, and the builder may bring a claim for a sum over and above that allowed by the architect." The reader may be referred with profit to another point, the "Contingent engagement of an architect," by which he will see the importance of being careful in accepting employment that is made contingent on certain events which may not happen. Under the head of "Builder"—also there are one or two useful hints—namely, that when a builder fails to carry out his work according to the terms of the contract, the employer may either deduct a fair amount, or if he has already paid, bring a cross action; also that the payment can be withheld altogether in case the work has been so badly executed as to be useless to employer. Under "Certificates" some useful principles of law are enunciated, the general effect of the cases cited showing the architect's certificate to be a powerful instrument. It is clear, for instance, that an architect's final certificate may supersede written orders for extra work, by allowing such work at the end; at the same time, from "Ludbroeke v. Barrett," an architect can be sued by the builder for withholding, in collusion with the employer, his certificate of completion, when the contract has been made by him as the employer's agent. A builder can also bring an action against the employer for work, if the architect has fraudulently withheld certificate by collusion with his client. Further, it is necessary for the architect to use discretion, and be perfectly fair in giving certificates, for in the case cited ("Pawley v. Turnbull"), the plaintiff, the builder, was entitled to recover from the employer the full amount of contract and extras. We recommend to the reader an attentive perusal of this portion of Mr. Roscoe's little treatise. It is sometimes thought that an order for extra work invalidates the clause in a contract to complete work under penalty, but the case of Legge v. Harlock establishes the principle that such orders do not put an end to the stipulation, but only entitle the builder to have an allowance made for the extra work. The author, in alluding to another case, well cautions builders against entering into stipulations of a wholly one-sided kind, and signing contracts to perform impossibilities, from which the law does not help them to excuse themselves. An agreement to do extra work within a reasonable time made after the former agreement, and when such work is mixed up with the orginal work, prevents the employer suing for penalties under the first agreement. Again, a builder can argue, by another case cited, that the employer or his architect prevented the completion of a work, thereby causing him damage. Such hindrance may be caused by default of the architect in supplying plans and drawings.

A very important point affecting architects and contractors is mentioned in page 31: it is to the effect that when an architect or contractor enters into a contract with a corporation the contract will not be binding unless it be under seal. The case of "Hunt v. the Wimbledon Local Board," which was referred to by us not long since, is the latest decision on this point, and cannot be too well remembered by the profession. In commenting on this case Mr. Roscoe observes: "It is noticeable, particularly as showing the necessity for architects to stand on strict legal principles in dealing with public bodies such as local boards. Because it is further stated by the Court of Appeal that, in their opinion, even if the architect's plans are used by a corporation which acts not for its own benefit, but as trustees for a certain portion of the public, such a corporation would not be liable on the ground that it had benefitted by the work, as would be the case generally speaking if similar facts existed in a contract between an architect and a private individual." A case of similar import to the architect was decided in "Moffat v. Dickson," when it was ruled that drawings and specifications prepared on approval cannot be legally charged for by the architect unless they are approved. We are sorry so few decisions affecting this question have been given, as a great many architects have discovered to their cost that they may really do an immense amount of work and render service without remuneration. We may mention another and by no means uncommon case. A building committee is appointed to receive designs and drawings for the erection of a new church. These are prepared, by order of vicar, by an architect, with of course the implied belief that he will be paid for his labour and services in their preparation, even should the funds for the building not be sufficient to carry the drawings into effect. The vicar is removed to a more lucrative charge. The architect attends various meetings, prepares drawings and specifications for a rebuilding of the old church; but when he sends in his account finds that no one is answerable, and the only advice he gets is that he should have obtained a faculty. Cases of this kind are happily rare; but young architects occasionally find themselves in the position of a man who has no legal redress. Again, builders are sometimes led to do extra work without a written order, but they are not all perhaps aware that even when they are ordered by the employer, they cannot be legally claimed without such order. Of course this principle is good only when a written order for additions has been stipulated in contract. On a similar principle, when a builder undertakes by contract to build and complete a house according to a specification, and certain details, such as flooring, are omitted, which are necessary for its completion, the builder cannot charge for it as an extra. This principle, established in the decision of "Williams v. Fitzmaurice," is a sound one. It is necessary to point out that it only holds in the omission of some detail that it would be unreasonable to leave undone, such as the flooring in the case mentioned. In this instance the scantlings of the floor-joists, &c., were specified, but no mention made of the flooring. It would be impossible with fairness to apply the same principle to details not absolutely necessary to complete a building, but which had been omitted mention in the specification, and the less architects have recourse to general clauses to cover their ignorance or carelessness the better. The other cases cited by Mr. Roscoe, under the heads of "Landowner," "Liability for execution of works," "Lease," "Penalties," "Tenders," "Warranty," &c., are important, and deserve the attention of the profession. The precedents for pleading will be found of service, but more particularly the forms of agreements and conditions of building contracts appended to the book. The digest has been admirably printed by Messrs. Reeves and Turner, and we recommend every architect in practice to obtain a copy of a work that will save them much anxiety.

THE POLLUTION OF THE THAMES.

IN the last number of the BUILDING NEWS you adverted to the inquiry now proceeding at Westminster with regard to the effect of raw sewage upon the accumulations of mud in the navigable channel of the river. That inquiry is avowedly limited to questions affecting the navigation, and is not concerned with another subject of certainly equal importance to the well-being of the metropolis—viz., the wholesale pollution of the river and its banks both within and without the metropolis. The Metropolitan Board has never ventured to extenuate nor deny the existence of this pollution. It was affirmed last May, by a unanimous resolution of the Conference on National Sewage and Health at the Society of Arts, and was stigmatised as in regard of wasted wealth and neglected opportunity, a national humiliation, amidst the approving cheers of representative men from all parts of the kingdom. As far back as 1873 the Metropolitan Board, when urged to adopt some system of deodorisation in order to complete the purification of the Thames, the main object of the Metropolis Local Management Acts, only replied, "We have got rid of the sewage out of our midst. That is enough. We have spent four millions, and with the sanitary problem we have nothing to do."

In the last special report of the Medical Officer of Health for the Port of London, it is said that "the reaches of your district, situated between Blackwall and Erith, are now little better than a huge sewer, this being the only river in England and Wales that is permitted by Act of Parliament to be polluted without let or hindrance," and with regard "chiefly to those parts of the river abutting on the districts, for the complete drainage of which the Metropolitan Board of Works is exclusively responsible," there were at the date of the report 176 foul outfalls of all descriptions, viz., "70 on the north, and 106 on the south side," polluting the stream within the area of the metropolitan main drainage system. There is, moreover, a large sewage outfall still discharging off Woolwich; and from other statistics, compiled with much care and diligence, "it is evident that the Board has not fulfilled even the letter of the Act" under which the main drainage system was constructed.

That the Metropolitan Board has violated the spirit of the Acts, the preamble of which affirmed the necessity of works to be "completed for the purification of the Thames," has never been contradicted; though it must be confessed that whilst some of the provisions of the Act of 1858 are clear and imperative, others are permissive only and ambiguous—a loophole through which the Board have hitherto contrived to escape.

One point, however, admits of no ambiguity, viz., that in disposing of their sewage the Board "shall act in such a manner as not to create a nuisance."

That this provision is day by day ignored and set at nought can be proved by a cloud of witnesses: ask the vestrymen of Woolwich; the bargemen plying between the Medway and Westminster; the riparian proprietors below Barking; or the masters of vessels becalmed in the reaches above Gravesend! But who, we ask, is to bell the cat? Who can be found to bear the cost and risk of fighting, as it were on its own dungheap, the crowing Chanticleer who proclaims from its vantage-ground that the "waste of sewage" is the logical result of modern science and practical sanitary experimentation?

The conservators of the Thames are in some sense charged with the duty, but they are more concerned with the navigation of the port than with the health and comfort of the people.

The arbitrary limitation of the inquiry at

Westminster, before Mr. Bramwell and Captain Douglas Galton, R.E., is matter for regret, more especially for this reason—that physical obstructions to the navigation caused by silting up can be removed by dredging at a cost easily to be ascertained; whereas the mischief of continuous pollution by the organic constituents of sewage is not susceptible of accurate measurement, nor can it be redressed without an entire change of policy, and a subversion of all the ideas which have hitherto prevailed with the authorities in Spring Gardens. From this point of view, the sanitary aspect of the question is by far the more important subject of inquiry.

The Corporation of London is not indifferent to the material well-being of the East-end population, witness Epping Forest regained, and Burnham Beeches rescued from destruction! They are, we believe, the sanitary authorities of the port, and the report from which we have already quoted has been in their hands since December, 1878. There has surely been time enough for digestion; and whilst an inquiry is already pending with regard to the "silting up of the Thames," it would seem to be a mockery of the public patience to restrict the arbitration to only one branch of a gigantic evil.

By the 31st section of the Act, the Secretary of State, at his discretion, may cause inquiry to be made, and take such proceedings as he may think fit to insure the abatement of such a nuisance. Is the health of London, the navigation of its noble river, nay, the very existence of the port, no concern of Government? Where will you find scope for domestic legislation if not here?

It is useless to wait on Providence in the guise of private enterprise, or the intervention of aggrieved proprietors. They dare not grapple with this monster—a sort of Frankenstein, created and designed by the Legislature for the especial purpose of "completing the purification of the Thames," and yet the author of its wholesale contamination! Some adventurous spirits have essayed the task; like the Essex Reclamation Company, whose untimely fate you have already described. The Native Guano Company have at their own cost striven gallantly to demonstrate the practicability of defecation; but the contest has left them sorely maimed, if not altogether worsted.

"Scott's Sewage Company," with all the *prestige* of acknowledged scientific experience, and backed by social influences of the highest value, has urged, demonstrated, and protested—but all to no purpose.

Nothing now remains but for the Secretary of State, at the instance of the port sanitary authorities, to cause inquiry to be made, as the first step towards the cessation of a mischief endangering alike the value of riparian property, and the health of the metropolis.

Inner Temple. C. N. CRESSWELL.

ARTISAN REPORTS ON THE PARIS EXHIBITION OF 1878.*

In the spring of last year a joint committee of the Royal British Commissioners for the Paris Exhibition and of the Society of Arts, sent a number of selected artisans to Paris, in order to report on the Exhibition. In this movement and subscription, nine of the largest manufacturing towns of Great Britain, one of the City Companies, the Builders' Society of London, and several private firms, co-operated, so that in all some 204 men were sent out through the agency of the committee. Excellent arrangements appear to have been made for selecting the representative artisans, for their accommodation, maintenance in Paris, and to explain to them what they were expected to do. It is manifestly impossible to gauge the effect of the mental stimulus afforded to the picked parties of artisans by the visit; but a tangible result of the undertaking was, that 168 reports were received by the committee from the delegates. Of these, those from Liverpool (10), Bristol (9), Leeds (6), Huddersfield (5), and Leicester (3), have been printed by the various towns, and the Coachmakers' Company have also published five reports. A selection was made from what were considered the best reports, and these having been edited by the present secretary of the Society of Arts, Mr. H. Trueman Wood, assisted by Dr. Mann, have only just been issued, more than a twelvemonth after the close of the Exhibition, in the bulky volume before us.

On cutting its leaves we see that the book consists of 664 pages, and it comprises thirty-nine separate reports on a wide range of subjects. As might be expected, these papers greatly vary in character. A few descant at length on the Exhibition, and on details of merely ephemeral interest; but the pruning knife has been, in the main, judiciously used, and although there are here and there repetitions, digressions are not common; and these venial sins of commission may be overlooked in view of the evident care that has been taken to leave intact the individuality of the several reporters. The writers very generally dovetail into their statements their conclusions upon the general character, not only in the Exhibition, but throughout Paris and its suburbs as far as seen, of the industry reported upon, thus giving permanent value to the reports, and many of the comments are noteworthy for shrewdness and common sense. We notice that the reports have also been issued in twelve parts, at the price of 6d. each. Of these the most valuable to our readers will probably be Division 5, "Building Trades"; Division 6, "Cabinet Work"; Division 2, "Art Workmanship"; and Division 1, Parts I. and II., "Pottery and Glass." Having indicated the history and nature of the work, we propose to summarise some of the conclusions of special interest arrived at by the reporters, only adding that the entire responsibility for the statements made rests with those whose names are appended to the reports.

Throughout the book there is a concurrence of opinion as to the superiority of English over Continental artisans. The many advantages possessed by foreign, and more particularly Parisian, workmen are admitted with equal unanimity,—their abundant opportunities for art education afforded free of cost in museums, galleries, and institutions, open seven days a week, their more general sobriety, and their greater capacity for simple amusements. On the other hand, it is recognised that these external pleasures are popular because of the absence of true home comforts, and this and the long hours of labour continued throughout the greater part of Sundays are commented upon as unenviable features of the French artisan's life, which counterbalance the special advantages he enjoys. There is also an agreement of testimony that in the shorter number of hours' work the Englishman will produce more and better results than the Frenchman in his longer hours of labour.

One of the clearest and most practical papers is that on "Bricklaying," furnished by Mr. George M. Berry. Both in Paris and the towns and villages outside its walls bricklaying seems to be, he says, the work of only two schools of bricklayers, of definitely fixed methods, with a remarkable sameness of design and of execution in these two methods. The execution in the best work consists without exception in laying the bricks in mortar, as if "left for pointing," and in afterwards stopping-in the joints, and laying on with a ⅜in. pointer a white joint in either plaster or putty. The only other method of finishing the face work is to lay the bricks as described and to stop-in with white material; the whole is afterwards coloured to the required shade, and the joint brought out white by ploughing into the stopping with a jointer run along a straight-edge rule to ¼in. depth. The width of beds is about ⅜in., alike for bed and cross joints. In laying bricks for pointing or external plastering, French workmen make no attempt to fill the joints, but leave them gaping to ¼in. depth, so that no raking-out is required. By this means a better key for either stopping or plastering is obtained, and Mr. Berry thinks the practice might be usefully adopted in this country. The greater durability of French over English work is due not to climate, but to this open-joint mode of construction, and to the employment of a less absorbent material for pointing. The only artistic effect produced in brickwork in Paris is the universally-adopted checkered, lozenge-shaped, and square patterns, either light or dark red or blue, which are supposed to be done in various bricks, laid to regular bond, but which are often the work of the pointer or the painter. He saw no example of moulded brickwork, either in or out of the Exhibition, nor any exhibits of moulded bricks, or rubbers, or of cutting bricks of French make. The drawings in the architectural and civil engineering departments showed no indication of cornices, moulding caps, gauged arches, scrolls, or carving in brickwork. Indeed, ornamentation in domestic architecture does not seem, he says, to run very high in France. The French appear to delight in decorating their public places and edifices, but, unlike the English, have not applied the same rule to their houses, which are ranged in grand but monotonous lines. At present, however, the uniformity of Haussmann is being gradually superseded, and the taste of the architect's client as well as that of the architect is being cultivated in Paris. For the accommodation of the English, about Passy and the Bois de Boulogne, there is a strike off in the direction of villa building; these are mostly in the Louis XIII. style, somewhat English in appearance; and brickwork largely enters into their construction. The domestic architecture of Paris, either on the grounds of external show or of internal comfort, is not, the reporter thinks, to be preferred to ours if examined in detail either as to the bricklayers', masons' or plasterers' work. The sanitary arrangements of Parisian houses are, as a rule, very bad. The closets rarely have water laid on; the rooms are small, badly lighted and ventilated, and without fireplaces; while a closet at the bottom of the house, having only a stone slab or iron plate six inches from the floor, with places to rest the feet upon, is the common provision made for houses ranging from two to five stories high, and occupied by from three to eight or nine families. Sinks and washhouses are quite the exception. Open backyards and forecourts in front are rarely seen; and owing to the proximity of houses, the want of light in bedrooms is a common defect. The water supply to houses about Vaugirard, Grenelle, and Montrouge is very insufficient. Mr. Berry next criticises the specimens of brickwork exhibited by Holland, Belgium, and England in the famous International Façades of the Exhibition. Of these the Dutch specimen was, he says, the best for workmanship and finish. The pointing, which was in white, was peculiar in execution. The joint, after being laid on, was laid back by the trowel to form a wedge shape, sloped up from 3-16in. at base to a sharp edge in front. The Belgian work looked very dirty, the joints being badly struck with the trowel and the work rough. The only English specimen of brickwork proper was Messrs. Collinson and Lock's half-timbered house* built from Mr. T. E. Collcutt's design. The execution spoilt a good design; the mouldings of the brickwork were rubbed out of shape after being set, and the joints were badly filled in and dirty. Of Messrs. Doulton's terra-cotta pavilion,† erected from the designs of Messrs. Tarring and Wilkinson, the opinion pronounced is that the design was too heavy; the colours were inharmonious and too diversified, and while the squareness of blocks and sharpness of mouldings were good, the smallness of some blocks, and the consequent large joints suggested the need of a more thorough knowledge of the contraction of terra-cotta and the art of baking it. The competition in concrete was confined at the Exhibition to France and England. Of French work the most notable examples were the full-size sections of sewers, which are built of this material and to large size in Paris. The concrete is composed of 1 part of "Portland" cement, 1 of sand, and 6 of a broken local stone, of a light and honey-combed character. A personal inspection of the great sewers, which should, he says, rather be called subways, led Mr. Berry to regard the system as unwholesome and very incomplete. The Parisian bricklayer gets 7d., English, per hour, for journey work. The working hours are from 6 a.m. to 6 p.m. under one method, and from 6 a.m. to 5.30 p.m. under the other, Sundays being treated as other days. The earnings thus amount to 43s. 1½d. for a full week of 77 hours, and 41s. for 73½ hours. The pay-day is once in four weeks, on Saturday evenings, and on the following day he can, if he choose, take a holiday. There is not in Paris the convenience for early travelling we have, artisans having as a rule to walk to their labour. Compared with the English bricklayer, who receives 9d. per hour for 52½ hours per week, enjoys the free use of his time on Saturday afternoon and Sunday, and leaves earlier in the evenings; it is easy to see that although the Frenchman's earnings are the higher, week for week, his lot is not to be envied. Overtime is not much in use on large jobs, but in the suburbs and on little masters' work is adopted, when the following rate is uniform; from 6 to 7 p.m., 2d. extra; from 7 till 8 p.m., quarter time extra, and after that hour double time is charged and paid. An hour is allowed for the first meal, either at 10 or 11 a.m., and although no authorised pause takes place until the close of the day's work, the men may, if they choose, go out at 2.30 p.m. for luncheon, half an hour being allowed; this is chiefly taken by those who work the full time. Piecework is carried on to a large extent in the outskirts of Paris, and in the country likewise, and the prices paid are equal to:—Brickwork, £2 17s. per rod; moellon, or fixing large blocks of stone which have been only bedded and jointed, the face left in rough, 2¾d. per cubic foot; building rubble work, 4s. 7d. per cubic yard; tuck pointing to brickwork, 25s. per 100ft.; superficial small jointings, from 7s. to 9s. per 100ft. super. French bricks are not equal in quality to our red malms, white stocks, and white Suffolks; they are generally well burnt, but the common ones are very brittle. The cost per 1,000 varies from 44s. to 53s.; the sizes are somewhat smaller than ours, being 8⅝in. by 4½in. by 2¼in. approximately. Red tiles of firm quality are about 40s., while Bourgogne tiles range to 84s. *Cement Passy*, the Parisian equivalent to Portland cement, is 2s. 4¾d. per bushel, weighing 110lb., and Roman cement is 2s. 2¼d. per bushel. Lime is 11s. 9d. per cubic yard. Plaster of Paris is but 7¼d. per bushel, and its almost incredible cheapness (about one-fifth of our price) accounts for its very free use in building operations. French plasterers do their pricking-up with plaster, and nail the laths 4½in. to 5in. apart, and the ceilings are pugged in on a boarded sheeting fixed under the laths, which is afterwards struck, and the finishing done from beneath with plaster also. The tools of the French bricklayer differ only in the trowel and mortar-trough. The latter is the same as used in some parts of Scotland, and by masons' fixers, and is similar in shape to a washing tray. The French trowel is made to suit the trough, and both cutting and trimming are effected with a brick-hammer. The labourer's hod as used on the ground consists of boards, 1ft. 10in. by 1ft. 2in., set at right angles to form the bottom and one side of a box. That which forms the side being fixed on two short poles, one to rest on each shoulder, and the upright board prevents the mortar, which is loaded by an assistant, from slipping down the bearer's neck and back. It may be possible that more stuff can be carried by this clumsy tool than by the English hod; but it does not seem customary to overload the bearer.

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* The Society of Arts' Artisan Reports on the Paris Universal Exhibition of 1878. London: Sampson Low, Marston, Searle, and Rivington.

* Illustrated in the BUILDING NEWS, May 10, 1878.

† Illustrated in the BUILDING NEWS, May 17, 1878.

In a paper on "Stone and Machinery used in Stone Work," Mr. William Pyle explains that the principal stone used in Paris is soft, something like our Bath stone, and that some thirty kinds are employed. The walls are generally built solid. The masons are of two classes: first those to take the rough block as it comes from the quarry, two men generally working together, sawing and roughing-out, and making beds and joints. The prepared stones are taken by labourers to the lift, a square fixed scaffold built at the commencement of the job to the intended height, with patent crab at bottom. The stones are drawn up to the required height, and then rolled from the scaffold to the wall, and placed in by means of bars. This is no improvement on the English mode. The beds and joints are large and rough, and their position is not regarded in fixing or working. After the wall is built they start from the top and work down with planes. For plinths, bases, and caps Chateau Landon, a stone rather harder than our Portland and sometimes very coarse, is used. The reporter did not see any sawing machinery in use in Paris, everything seeming to be done by hand. The heads of openings are generally worked in small stones, with key joints, instead of being covered in with one stone as in England; on the latter plan if there be the slightest settlement, the heads get broken, whereas this is a rare occurrence in Paris. There seems no fixed rate of payment per hour for the workmen; a first-class mason gets from 7s. to 8s. 4d. per day of ten hours, and rough-work masons and fixers get 6½d. and 7d. per hour. The work is generally done by the piece, payment being reckoned by the mètre. The hours are the same as the bricklayers, and the character of working is described by Mr. Pyle as loose and careless. He considers that labour on stone is cheaper in England than in France, principally on account of the deficiency of machinery there and the loose system of working. The system of dividing the masons into two classes seems an advantage both to employer and employed; but the mode by which the men are kept apart, by first roughing-out, then building, and finishing afterwards, could not be carried out with English stones. In his report on "Plaster Work," Mr. M. Currey declares the plain plasterer in London to be a cleaner, cheaper, and superior artisan to his *confrère* in Paris; but the ornamental plasterer of the latter city is in every way superior to the English artisan of the same class. This he attributes to the careful study of ornament before it is carved or modelled, and to the splendid examples of ornamental plastering and carving afforded by the Palace at Versailles, and the Louvre, Madeleine, Pantheon, Palace of Justice, and hundreds of other buildings in Paris, at easy command, both of time and place, for the designer, carver, or modeller to study. The cements for building purposes exhibited by English firms were superior in strength and general utility to those shown by foreign firms. Mr. William Hodgson, in a report on "Joinery," severely criticises the constructional features of the "Street of Nations." The most common faults were roughness and want of finish, and the Jury-house does not escape from stricture. In the exhibits of practical joinery and carpentry, for careful selection of material, firmness of framing, general soundness of workmanship, to insure durability and excellence of finish, the foremost place was certainly due to Great Britain. The inclosures from Norway and Sweden were well-constructed examples of deal framing. Russian productions were rough, and wanting both in design and finish. The French availed themselves, in their constructions, of every opportunity for displaying scroll, tracery, and fretwork ornamentation.

"Furniture" is the subject of a paper by Mr. Thomas Paterson, who says that while in this class the Exhibition of 1878 showed a marked advance on its predecessors; there was little to be found which was new, whether in the introduction of materials or methods unknown before, or in the extension of already known processes of treatment in fresh directions. On the French side were exhibited some small examples of a placage in paper, said by the inventor to be as solid as the ordinary wood veneer. Mr. Paterson suggests that no reason exists why a tissue might not be made which should be capable of receiving very delicate ornamentation either by printing or photography, and as wear-resisting and certainly as thick as ordinary wood veneering. In painted decorations for furniture, two English exhibitors claimed to have exhibited novelties. Mr. J. A. Heaton, in his gesso work, which had a certain richness which might make it useful in many cases, and the examples of xylography shown by Messrs. Whitbarn and Young, in which the natural brilliancy of the wood was not deadened by any process of dyeing. There was a considerable advance in the substitution of machinery for handwork, and this could be traced in a more complete mechanical accuracy of finish, which was not, however, always an improvement. Regarded as a competition of nationalities, the most remarkable thing in the exhibition was the very great advance accomplished by English furniture makers in the goodness of design and in ornamentation of work, as compared with that of other nations. Some very good and suggestive work was to be found in the Japanese section, but the real competition, so far as the Exhibition was concerned, lay between England and France. The French furniture designer confines himself, says Mr. Paterson, within very narrow limits; for the richer cabinets he adopts the Renaissance of Francis I., and for chairs and couches the style of Louis XIV. and XVI.; he does not trouble himself with any art but that of France, and except for ecclesiastical furniture, with very little of the artistic work of France before the time of Francis I. This gives both to designer and workmen facility in handling, but tends also to a poverty of design and to mere mechanical execution, leading in some workshops to a division of labour in the carving of the same design, and to each workman limiting himself to certain kinds of scroll or foliage work. This facility in producing and applying ornament tends to that overloading with decoration which was seen in the French court of the Exhibition. Another grave defect of French ornament is a constant recourse to the use of gilt or lacquered ornaments to make the work effective, often without reference to the general outline, which, at a short distance, often has the effect of a mis-shapen lump of gold. In the French department there was a magnificent show of furniture of the richest kind, some of it extremely beautiful, and most of it well-constructed; but there were not many marks of originality or progress, and in many cases the effect produced was only attractive to those who consider that if a thing is covered with well-executed ornament, it must be beautiful. The English section presented many more signs of life and energy, sometimes, perhaps, pushed too far, but, on the whole, indicating an immense advance. This the reporter ascribes in great manner to the influence of Mr. Morris and his school, and he thinks there can be no doubt that Mr. Morris has greatly improved the English taste in the colours and patterns of carpets and wall decoration. Whether the revival of the Queen Anne style will be permanent depends on whether we can put enough life into it to adapt it to our wants and habits. Having referred to the exhibits of the Misses Garrett, Messrs. Collinson and Lock, and Messrs. Gillow, Mr. Paterson asks why the names of the workmen are so completely omitted from all mention. The French firm of Christofle is an honourable exception to this almost universal concealment of the names of the real workmen. They took pains to publish the names of their chief workmen, specifying the portions of work done by each. How can it be expected that workmen should take pride or interest in their work when they are completely ignored in an exhibition? The unsatisfactory feature about the Paris Exhibition was the entire absence of good, well-designed furniture, at a price suited to the wants of the great mass of a comparatively poor people.

A report on "Cabinet-Making" is furnished by Mr. John Frazer, one of the Dublin delegates, who compares the exhibits of England France, and Italy, and laments that not a single exhibit came from Dublin, once famous for the beauty and solidity of its work. He thinks the reason for the gradual extinction of the Irish schools of good workmen is due primarily to the fact that the public taste in house furnishing has degenerated into the vulgar. The gentry and moneyed classes prefer, he says, glaring, highly polished but roughly made and shaky pieces of furniture to more chaste, elegant, and thoughtfully designed work, with carvings and mouldings in true taste. For this decadence of Irish taste he not alone blames the furniture dealer but also the architect, who, he says, appears content with designing and erecting splendid mansions, and leaves his client to spoil the whole by furnishing these with materials and designs out of character with the buildings. Another reason for decline is that in Dublin manufacturing firms the head carver has himself to design the work, draw it for the men, and even carve it; whereas in Paris there will be one chief and eight supernumerary designers and draughtsmen in one cabinet factory. As to the exhibits, the English furniture stood before that of any other country, and had every qualification constituting good workmanship. The best features of English work were simplicity of construction, smoothness of finish, level surfaces, close joints, regularity, making and mitreing of mouldings, fitting and "running" of drawers, making of doors, and selection of timber suitable for the work contemplated by the designer's pencil. For inlaying, the work of Messrs. Jackson and Graham was unrivalled for beauty of design and excellence of workmanship, and illustrated the advantage of wood-working machinery to the cabinet manufacturer. The French exhibits presented a great sameness in design, and, with a few exceptions, the workmanship was not of the highest order, and lacked finish. The modes of construction of these nations are very different. The French veneer all their good work in oak, and show the oak on the inside irrespective of the outsides, which may be walnut or satinwood. The English make their work look as if all constructed out of one material, giving an appearance of greater solidity. The endeavour to flank panel every part which the French carry to the extent of making imitation framings with veneer is highly objectionable, for the wood cannot expand or contract with changes of temperature, and the result is broken joints and uneven surfaces. The English make all their carcase work permanent, while the French make it portable, and the several parts of their work are put together with thumbscrews, which is never so good as dovetailed and glued work. The Italian work in the Exhibition was inferior to the French in construction and finish, but, as in France, everything was made subservient to the display of the carver's art. Their carvings were splendid, but there was a carelessness in trifles which marred the work. It was much cheaper than either French or English. The wage rate in France for cabinet-making is better than in England, and far above Ireland, but the hours are much longer. Dublin manufacturers have, Mr. Fraser says, great advantages over those of Paris and London, both in time, wages, and the speed at which men ~~work~~, and Dublin could therefore manufacture nearly all the cabinet work sold in it with profit to employer and advantage to buyer. Mr. Henry R. Paul, in his report on "Cabinet Work," arrives at much the ~~same~~ conclusions as Mr. Fraser, but deals with the exhibits of each nation in detail in a voluminous paper. The construction of French work, although better than most of Continental displays, was not so correct as the English, for it was so surrounded with carving that the construction was subordinated to the ornament. In many cases the carver had cut so deeply into the framing that the furniture was too weak to be of service. In the Belgian exhibits, there was a falling off in the carving, but a gain in the construction. There were none of those awkward pieces shown in the French section, but then there was not the excuse for them, for the work was less elaborate. The Austrian display of wood furniture showed at once the perfection at which the working cabinet-maker had arrived, and the poverty of his designs. The only difference between this and the Hungarian show was that the latter was less skilfully executed. The most peculiar European exhibit was that of Russia. The style of exhibits was so thoroughly savage and uncivilised that the furniture was quite unique, although it could not be considered ugly. There was an evident striving after solidity, and the woods used were of the strongest kinds. The Japanese collections of furniture were so original in design, so artistic in treatment, and so neat in workmanship as to constitute one of the most pleasing displays. It was full of quips and cranks and of quaint disorder everywhere. From Japanese to Chinese work was a long step, and artistically a downward one in design and workmanship. The execution was so rough and weak that the ornament was the sole reccommendation. An amusing illustration of the peculiarities of the "heathen Chinee" is given. The obliging Chinaman who showed Mr. Paul the articles, in opening the doors of a wardrobe (to do which he had to take away a paper wedge that kept them closed, the lock not being workable), pulled off the handle. With a coolness which belongs proverbially to his race, he spat upon it, stuck it on again, replaced the paper wedge, and passed on to the next specimen. Never before did the British furniture manufacturers enter so heartily into an exhibition as into this one, and the great advances made since the Exhibition of 1851 were very apparent. The English specimen which won the grand prize of 1878 was as far in advance of the French cabinet of 1851 as that was before the English *chef d'œuvre* of that year. This prize exhibit of 1878 was a chimney-piece, with glass above, and clock-case and two candelabra on the mantelshelf, of Greek design, and was shown by Messrs. Jackson and Graham. The reporter smartly criticises many of the exhibits in the English section, reserving his heaviest fire for those shown by Mr. W. H. Lascelles, which, he says, are some of the ugliest cabinet works in the English section, both in design and workmanship. The designs, which were by Mr. Norman Shaw, R.A., were certainly distinguished by originality, but could not, by any stretch of taste, be considered suitable to a modern house. Some of these exhibits are made uglier by the construction being shown, by the tenons going completely through, and then being pinned. But a tenon, properly made, will be no stronger, but the weaker, for being pinned, nor will a badly-made tenon hold together any better for being pinned, so that the cry of truth in art is quite erroneous. Messrs. Shoolbred's exhibit of satinwood furniture was designed in the most extravagant manner, and the design by Mr. Batley appeared to be the Queen Anne style carried out to the most extreme point. In a description of visits to some Parisian cabinet-making firms, Mr. Paul remarks that French cabinet-makers do not individually possess anything like the amount of tools that a London man has. Workshops are attached to factories for the purpose of making the tools required in the manufactory, the firm finding all the tools but about £3 worth to each workman.

In a report on "Flower and Ornamental Gardening," Mr. Geo. Stanton mentions as the best trees for avenues and squares the plane, horse-chestnut, and false acacia. The Paulownia imperialis makes a shady tree, but it is more suited for a square than an avenue. At the Exhibition glass houses were numerous; amongst them Messrs. Boyd and Son's handsome and well-built conservatory being conspicuous. The houses of French manufacture were chiefly of iron, having curvilinear roofs and ornamental exteriors. Copper hot-water pipes seemed to be going out of fashion; many of the houses exhibited had cast-iron pipes ~~with~~ india-rubber joints. Mr. J. Simpson, who takes the allied subject of Horticulture, mentions a conservatory shown by Mr. W. H. Lascelles as one which would make an excellent vinery and plant-house combined. It is a lofty circular domical structure with no division betwen roof and sides, so that the water runs down to the ground at once; it is light, receives all the rays of the sun, and avoids the objections felt to most circular vine-houses because of their breaks and angles.

We shall revert to these reports next week.

TUNNEL OUTLETS FROM STORAGE RESERVOIRS.

At the second meeting of the Session of the Institution of Civil Engineers, held on Tuesday, the paper read was on "Tunnel Outlets from Storage Reservoirs," by Mr. C. J. Wood, M. Inst. C.E.

The subject was divided into the consideration of culverts in a direct line through an embankment, and tunnels round the end of the embankment as a distinct work. The author stated that the practice of laying pipes through an embankment, governed by valves at the foot of the outer slope, was reprehensible, and had been abandoned for a culvert of masonry or brickwork, in which the supply pipes were laid. This method was not satisfactory, first, because of the settlement of the earthwork; and, secondly, because of the subsidence of the puddle, both of which were likely to damage the culvert and create leakage. In crossing the puddle trench, a stone or brickwork pillar had sometimes been used to remedy this difficulty with partial success, and in other cases a "slip-joint" had been made of the portion of the culvert crossing the trench, to allow a slight vertical movement. In consequence, however, of the uncertain settlement of the earthwork of the sides of the embankment, this movement might not be vertical. The advantages of a culvert through the embankment were speed, economy, and the building of the culvert in daylight; these culverts were frequently surrounded by a coating of concrete, which gave additional security. The study of culverts under high railway embankments was suggested, and the author believed it best to leave the bank, if possible, intact, by an alterative method—that of driving a tunnel round or under the end of the embankment in the solid rock as a separate work, the tunnel to be lined with stone, brick, or cast-iron segments backed with concrete. The objections to this plan were stated to consist in the work having to be done in comparative darkness, in the possible displacement of the natural strata of the ground, producing a creep of water outside the tunnel, and in the difficulty of backing the crown of the arch satisfactorily. The expense was in favour of the culvert directly through the embankment; the tunnel, though more costly, was safer, as it was not in the most dangerous place. The draw-off valves, placed in earlier examples at the foot of the outside slope, which prevented necessary repairs, were now frequently at the bottom of a valve-pit built on the inside of the puddle trench in the embankment. These valve-pits were liable to get out of the perpendicular, and to prevent the valve-rods working; also the water went half way through the bank in the inner culvert. The draw-off valve was sometimes placed at the foot of the inner slope; it had a sloping face; and was worked by rods up the inside slope. The drawbacks were that stones were apt to settle, that there was great thrust on the valve-rods, that there was a want of access to the valve in case of accident, and that the least cleanly water was drawn off. A culvert terminating in a valve-tower of masonry or iron was the best plan, the valves being in duplicate, one set inside, the other outside, the tower. The author advocated the tunnel clear of the embankment and valve-tower as the best and safest, if more costly, plan.

Some remarks followed on the works for the supply of water to Bradford, Yorkshire, which was obtained from three districts. A high-level supply was taken from the hills above Oxenhope; an intermediate supply from Manywell Springs; and a low level supply from Skipton histrict. The high-level reservoirs afforded instances of tunnel outlets. The Stubden reservoir had been a cause of anxiety, the original culvert of masonry proving leaky. It had been abandoned in favour of a tunnel lined with cast-iron plates backed with concrete, terminating in a cast-iron valve tower, erected from the design and under the superintendence of Mr. A. R. Binnie, M. Inst. C.E. The embankment was cut down, the original culvert taken out, and the ~~embankment~~ was then made up solid in thin layers, the new tunnel being used to run water off during the reconstruction of the work. No leakage of any description had since been noticed, the valve-tower and tunnel being water-tight.

The Leeming compensation reservoir for millowners had been originally made with a circular culvert having a slip-joint and iron shield where it crossed the puddle trench. This culvert was seriously fractured by the subsidence of the bank, which was mostly on a clay foundation, and it was considered unsafe to fill the reservoir. On the suggestion of Mr. Rawlinson, C.B., M. Inst. C.E., and of Mr. Binnie, on the latter taking charge of the Bradford Corporation Water Works, the old culvert was abandoned, and a new tunnel was substituted, similar to the one at Stubden. The original culvert was afterwards filled on the inside with concrete, and the reservoir was successfully filled with water, no leakage or disturbance having occurred up to the present time.

In the case of the Leeshaw reservoir, which was in course of construction, on Mr. Rawlinson's inspection it was resolved to abandon the culvert already cracked, and to substitute a tunnel outlet and valve-tower of cast-iron, similar to those at Leeming and Stubden; this had been successfully done, the reservoir filled, and the work had since proved most satisfactory. In two of the above cases the culverts were so damaged as to be a strong argument in favour of tunnel outlets distinct from the embankment.

The remainder of the paper explained the form and construction of the type of cast-iron tunnel outlet and valve-tower used in these works. The tunnels were mostly driven through Yorkshire grit and shale; they were 8ft. 6in. high, 7ft. wide, and each tunnel had a fall of 1ft. in its length. The tunnel commenced at the bottom of a shaft, 13ft. or 14ft. deep inside the reservoirs, in which the lower part of the valve-tower, cased with concrete, was afterwards built. The valve-tower was composed of cast iron rings with socket joints, caulked with iron borings and salammoniac; on the top of the valve-tower, at the level of the top of the embankment, a house was built to protect the valves, and the tower was connected with the mainland by a light wrought-iron Warren-girder bridge on stone piers. The tunnel starting from the bottom of the valve-tower was elliptical in form, made in rings, each ring being composed of four segments bolted together and surrounded by concrete; it extended in a V-shape under one end of the embankment, and was a distinct work; at the angle of the tunnel an air-shaft was sunk, which was subsequently lined with cast-iron rings, and formed a ventilating pipe. The supply-pipes, 2ft. in diameter, extended through the tunnel, and were jointed at the tower to a vertical stand-pipe, at equal intervals on which branches were cast and sluice-valves fixed. Connections to the pipes extended from the sluice-valves through the sides of the tower, and were further protected on the outside by flap-valves. Provision was also made for equalising the pressure on the flap valves, and for the expulsion of air when opening one of the flap-valves. A wrought-iron ladder extended up the tower, and at intervals there were grated floors so as to afford access to the valves and working parts. The connection of the bottom of the tower with the tunnel was made with a cast-iron gland, to the face of which a wrought-iron bulkhead was screwed, so as to make the valve-tower water-tight; the upper half of the bulkhead could be removed for entrance to that portion of the tunnel. These valve-towers had proved successful wherever erected. Mr. Binnie was the engineer for carrying out the works, the author being the resident engineer.

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ST. MARK'S, VENICE.

THE Universities of Oxford and Cambridge have joined in the work of saving St. Mark's, although the memorial presented by the last-named university is a separate and distinct one from that prepared under the direction of the Society for the Protection of Ancient Buildings. At the meeting, on Saturday, in the Sheldonian Theatre, Mr. Street made some very sensible remarks, and gave some information which was not before in the possession of the public. He urged that the western façade was constructively sound, that its present appearance was beautiful and venerable, and that the proposed alterations were detrimental to art. St. Mark's was a brick building incrusted with ornaments. Slight repairs would lead to great. One façade had been already "restored," and had entirely lost its warmth and beautiful glow of colour. So had the south side been treated, of which the surface was now new, and the interest of the artist and the antiquary had gone. Two years since, he could say from personal inspection, there was nothing in the state of the west front to warrant a reconstruction. The value of St. Mark's did not lie in architectural purity, nor in scale, but in beauty of colour. To "restore" it was an impossibility. The work of an individual genius could in no case be restored. The surface would be treated as in the baptistry, in which not a morsel of the original mosaic now remained. Of six persons he had lately met, three had pieces of it. Here was another piece purchased of the sacristan for a few *lire*. The modern mosaic was essentially different from the old—apart from all question of design—in its structure—*e.g.*, in the size of the pieces and the roughness of the surface, producing play of light and shadow. The pavement, which was probably originally irregular and in waves, had been made level and commonplace.

Dr. Acland regretted the absence of Mr. Ruskin, as the greatest English writer on art, whose name was inseparably connected with the "Stones of Venice," and read passages from Mr. Ruskin's letter to Count Zorzi, to whom Mr. Ruskin had referred him, heartily sympathising with the objects of the meeting.

We seem still to be without any exact information as to what is really intended in the way of restoration at St. Mark's. Probably we shall learn more in a day or two. Mr. J. H. Chamberlain, of Birmingham, is announced to deliver a lecture to-night in that town before the Fine Art Society on the subject, and he seldom speaks without accurate knowledge of what he is talking about. M. Charles Yriarte, the author of "La Vie d'un Patricien de Venise au Seizième Siècle," has also promised to send information from the city itself, and it may be as well to delay the presentation of the memorial in case it should seem desirable to modify its contents. The following is the text of the memorial which, by the way, Mr. Gladstone, in a letter read at the meeting last Saturday, declined to sign, apparently agreeing pretty much with the opinion we expressed last week as to the good likely to result from its presentation.

To his Excellency the Minister of Public Works of Italy.

We, the undersigned, architects, artists, men of letters, and others, lovers of art, and students of history, having been informed that the rebuilding or renewal of the Great façade of St. Mark's Church, at Venice, is under consideration, venture most respectfully to address your Excellency, and to express a hope that you will give your attention to some considerations contained in the following memorial, which we make bold to lay before you on the ground of the universality of the interest in a building which has always been a centre of attraction for people of taste and cultivation.

In an admirable picture by Gentile Bellini, preserved in the Academy at Venice, there is, as you are doubless aware, an accurate representation of this miracle of art as it then existed; and, comparing this with the building as it now is, we can see clearly that the façade has suffered little from the ravages of time since the end of the fifteenth century. Almost the only notable change is the substitution of comparatively modern mosaics for the ancient ones; though even of these a beautiful and perfect specimen is left us in the doorway at the north end of the façade. The delicate carvings and mouldings are as sharp and clear as if only finished yesterday; the shafts of rare marbles, collected with such care and pains, are still in their places; the marble slabs that cover the walls have not fallen down; and, in short, the whole front remains for us a storehouse of instruction in the history of style, and in the practice of architecture.

But furthermore, the lapse of time has done more than merely pass harmless over the invention and incident wrought out by the original builders; rather, it has glorified them; it has cast a veil of beautiful tone over the surface, which no device of man's hand could accomplished; it has softened whatever was crude, without hiding anything that was delicate; it has, we may say, restored those rare and laboured stones to nature without taking them from art.

Nor is that all. If this excellent work of art so kindly dealt with by nature had been preserved to the world with scanty or no records of its origin, it would be precious indeed; how much more precious is it then, being as it is a very hive of history and tradition; a relic of the wonderful state of Venice in the days when she was the link between the East and the West, and the foundress of European commerce. What a treasure the world has in this lovely building, schemed by men whose noble and dramatic lives have made their names household words at every hearth in the civilised world.

And if this art, history, and beauty of surface still exist in the building, and make the square of St. Mark's one of the classical spots of the earth, how lamentably rash must any alteration be. We are compelled to ask, what is there to restore, when all that architects, painters, and historians seek for is there in full measure? And if such restoration were desirable, it would be impossible. And in the vain attempt at it the total loss of that beauty of form and of surface, and the historical interest which the building now possesses, would not be risked merely, but certainly incurred. For every age has had its own style of art, bred of its own thoughts and aspirations, and every change in these latter has immediately received its due expression in art. The imitation of the workmanship of past times, therefore, must be carried out by those whose daily lives, in common with those of all modern workmen, are passed amid thoughts strange to that workmanship. They cannot understand its forms, which are repellent to their instincts; the rudenesses, of which most mediæval work is full, seem ridiculous to them; its excellencies are not those they have been aiming at; they work, therefore, fettered doubly, by their own traditions, and by those of the past. The very central point and reason for existence of the ancient work is missed by them, and they produce a mere caricature of it. The building dies under their hands.

The loss of the time-softened surface of an ancient building by the process of renewal is obvious enough, and it might have been thought that no less obvious would be the loss of its historical interest as a genuine document; indeed, this is allowed universally in the case of buildings that are beyond a certain age. No one, we imagine, has suggested the restoration of the Parthenon, of the temple of Philæ, or the circles of Stonehenge; yet we fail to see that the past of Venice is less a part of history than that of Greece, Egypt, or England, or that the study of it should be denied to the lovers of freedom and progress.

We also beg to remind your Excellency that the rebuilding of the façade would certainly necessitate the destruction of the historically interesting and artistically unrivalled mosaics that at present adorn the ceiling of the portico. We say destruction, because though the restoration of several parts of the mosaics of the interior has been attempted, the result has been the loss of all beauty and interest in those parts, in spite of the skill and care which undoubtedly have been employed in these restorations.

On all grounds, therefore, we believe that any rebuilding of the facade of St. Mark's Church, any renewal of its beautiful and venerable surface, will be an irreparable misfortune to art.

As to the soundness of its structure, we are not in a position to express any definite opinion, but we are confident that, if it be threatened, it is within the power of science to devise a remedy which would restore its stability without moving a stone or altering the present surface in the least.

If, on the contrary, that surface is tampered with, all will disappear for which the façade is now valued, nor will it be ever possible to bring it back again.

Such, your Excellency, are our firm convictions on this matter, and they urge us to plead earnestly with you for, at least, delay and further consideration of the question—a prayer that we feel sure will be widely echoed throughout Europe and America among cultivated people.

In conclusion, we beg your Excellency to excuse us if in pressing any point, our words have been too warm, since we trust you will believe us to be actuated by that gratitude to Italy, our instructress in the arts, and by that sympathy both with her past and present life, which is universal in all civilised countries, and is felt in none, we believe, more strongly than in England.

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The Bishop of Ely reopened the church of Barton-le-Cley on Tuesday, after restoration.

THE ARCHITECTURAL ASSOCIATION.

THE "Brown Book" of the Architectural Association, just published, announces in the annual report of the committee another year of continued prosperity. There has been an increase of 44 members, making a total of 812. The balance-sheet is satisfactory, showing an income, of nearly £370, slightly in excess of expenditure, and the balance in favour of the Association is £758 2s. 5d. The committee express satisfaction with the attendances in the various classes during the past session, and congratulate the members on the quantity and improved quality of work submitted. The 12th volume of the "Sketchbook" is in course of publication, and the committee extend their offer of five guineas for a title-page, to all members of the Association, whether subscribers to the "Sketchbook" or not. The prize list is headed this year by a silver medal, supplemented by five guineas or upwards, offered for the best design for a coffee-tavern on a corner site in a populous district in London, with 30ft. frontage to main thoroughfare and 60ft. to side street; the whole to be built in accordance with the Metropolitan Building Act. The Architectural Union Company offer prizes of £5 and £2 10s. for series of measured drawings of existing buildings or portions of buildings in England, erected previously to the 18th century. The Association further offer a prize of three guineas for the best essay on either of the following subjects:—"The Architectural Decoration of the Interior of a Modern Town House, or "The System of Building in Flats, for the Upper and Middle Classes, most suitable to English requirements." Each of these four series of prizes is open to all members of the Association, and the usual prizes are also offered to be competed for by "members of the several classes." All work submitted for prizes (except for the Sketchbook title-page, the time for which is limited to January 31st next) must be sent in before 6 p.m. on September 30th, 1880. It is announced that in consequence of the alterations which have been made in the Conduit-street premises by the Institute, the committee of the Association have taken upon lease the whole of the second floor. The new committee-room, which will also be used for the meetings of several classes, is larger, will be found more suitable than the old room, and the position of the library has also been changed.

The programme for the ensuing session is as follows:—November 21 (to-night), address from the president, Mr. S. Flint Clarkson; December 5, annual conversazione; December 19, "Common Sense in Architecture," by Mr. Cole A. Adams; January 2, 1880, "Architectural Illustrations and their Classification," by Mr. R. L. Cox; January 16, "Soul Bay and its Churches," by Mr. Basil Champneys; January 30, "Competitions," by Mr. Robert Walker; February 13, "The Civil and Domestic Architecture of Germany between 1500 and 1700," by Mr. H. W. Brewer; February 27, "Structures between the Piers of Ground Story Arcades in English Churches," by Mr. J. F. Wilson; March 12, "Famous Kentish Houses," by Mr. S. W. Kershaw, M.A.; April 9, Members' Soirée; April 23, "Haddon Hall, Derbyshire," Messrs. T. Roger Smith and R. E. Smith; May 7, "Unrest," by Mr. E. Ingress Bell; May 28, "Some Old Italian Architects and their Works, with Thoughts on an Architect's Education," by Mr. W. Scott, and nomination of officers; June 11, "The Special Planning and Arrangement of Sunday Schools," by Mr. C. G. Maylard, and election of officers for 1880-81.

The committee of the Birmingham branch of the association, in their annual report, which is also published in the "Brown Book," regret that they cannot express complete satisfaction with the progress made, although the session was fairly successful. It has been decided to raise the annual subscription for ordinary members to 15s., and that of honorary members to one guinea; the change will commence with the ensuing session and the committee hope to keep clear in the future of all monetary difficulties. The life class was not held last session, owing to insufficiency of members, and it has been decided to discontinue this class.

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An offer has been made to the householders who have Lincoln's Inn-fields under their charge, to keep the square in order as an open space if the holders will permit it to become an area of public rest.

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ELM GROVE BAPTIST CHAPEL, SOUTHSEA.—NEW RECTORY HOUSE, ST. ALBAN'S.—NEW CORN EXCHANGE, IPSWICH.—SCRAPS OF OLD HALF-TIMBER WORK AT WARWICK AND COVENTRY.—HIDE, SKIN, AND FAT MARKET, NOTTINGHAM. — PLANS OF CATHEDRAL AND MONASTIC PRECINCTS.

OUR LITHOGRAPHIC ILLUSTRATIONS.

BAPTIST CHURCH AND SCHOOLS, ELM-GROVE, SOUTHSEA, HANTS.

The site has a frontage of 71ft. to Elm Grove—a leading thoroughfare in the town—and is near to a convergence of several roads or streets, so that the tower will be a prominent object from all points of view. The restricted area of land has caused some trouble in the planning of the buildings, so as to secure good light to the church; and the front elevation is specially designed to obtain the utmost amount of window opening. Being nearly due north, this is feasible without glare. All external walls seen from Elm-grove will be faced with red bricks from Fareham, and all the dressings are to be of Bath stone. The roofs will be slated, and the spire also. Internally, the church will be divided transversely into nave and aisles by arcades of five bays, the columns being cast iron, and the whole of the ceilings groined in plaster. The groin ribs will be deeply moulded, and the treatment generally will be a wide departure from what is usually attempted in structures of this class. The accommodation in the church is for 800 adults, in appropriated sittings, including side and end galleries. The school-room, 55ft. by 26ft., will be over the ground-floor class-rooms, and will communicate with the church galleries. Scholars will enter from Occupation-road, in rear of the site. The spire will be 110ft. high to the top of the vane. Messrs. W. R. and C. Light, of Portsmouth, have taken the contract for £6,250; and the works are to be commenced forthwith. The architects are Messrs. H. J. Paull, F.R.I.B.A., and A. A. Bonella, 9, Montague-street, Russell-square, W.C.

NEW RECTORY HOUSE, ST. ALBAN'S, HERTS.

This new rectory house for the Rev. W. J. Lawrauce has recently been built, and is just now being completed. It is in the grounds adjoining the Abbey, and was erected from the designs and under the superintendence of Sir Edmund Beckett, Q.C., the well-known and distinguished author of "A Book on Building," and other architectural works. From this fact it will be of unusual interest to our readers, and our drawings have the additional value of having been taken from the building itself. The details clearly show the character of the work, which has been exceptionally well executed by Messrs. Longmire and Burge, the builders who are restoring the high-pitched roof and nave of the Abbey. Mr. J. Arney was the foreman on the work. The cost has been about £4,000. The walls are built of local purpose-made bricks, of a uniform dark purple colour, the same material being used for the arches and cornices. The sills are of rubbed York stone. The outer slopes of the roof are covered with Broseley dark-brown tiles, and the inner slopes are covered with slate, like the bay on the garden front. The interior gutter of roof discharges itself by a gutter, carried over the attics at the ceiling line, on to the outer slope of the roof on the north side, as shown by the upper plan. The timber used in carcassing was Crown Memel, excepting to the roof, which is of pitch-pine. The joinery to the principal rooms is of Oregon pine, and the staircase and balusters are of pitch-pine, sized and varnished. Oregon pine is a very beautiful wood, but is not much known in joinery. It was introduced here by Mr. Longmire, and certainly it is capable of producing an effect superior to other descriptions of white wood, either for French polishing or varnishing. It is free from knots almost entirely, and is possessed of a good, but not violently marked, figure, so often conspicuous in pitch-pine and other similar woods. The mantel-pieces in the dining-room and library are old oak examples introduced by the rector, who also furnished the modern semi-Gothic oak mantel in the drawing-room. The front door is grained oak and varnished, and the sash bars to the windows are finished in a dark colour. The several arrangements are carefully shown by the three plans which we give, the roof planning and skylights to top rooms being dotted on the upper plan. There is no step, as the line shown on the ground-plan would suggest, to the principal w.-c. adjoining the kitchen-door and parish entrance.

CORN EXCHANGE, IPSWICH.

We illustrate this week the design submitted in competition for the Ipswich New Corn Exchange by Mr. Brightwen Binyon, A.R.I.B.A., which was unanimously selected by the building committee and awarded the premium. We understand that since then the Town Council have instructed Mr. Binyon to prepare the plans for carrying out the work. The exchange is well situate in the centre of the town, back to back with the present town-hall, and is designed to harmonise therewith. The buildings consist of a large corn hall 131ft. by 60ft., with a belt of shops on two sides—towards King-street and Little King-street. The perspective view we publish is of the angle formed by these two streets. On the north side of the hall the irregular space will be utilised for retiring-rooms in connection with the exchange, also a public urinal approached from the town-hall passage, the remainder of the space being devoted to a settling office for the use of the merchants, and to a yard of 150ft. super., which is the space required by the local Building Act for all dwelling-houses; in this respect this plan differed from all the others, that a dwelling-house was given to the shop at north-east corner with the necessary yard. The shop is provided with a show-room and a sitting-room over the shop, and on the third floor a kitchen, and suite of sleeping-apartments in the roof. The shops on the south side are all to be small, those shown on plan being divided into two. On either side of the south entrance to the hall are offices which will be to let; as also the suites of three offices on the first and second floors. There are also rooms over the shop at the south-west corner, which will be used in connection with the hall. On the second floor towards King-street are a fine suite of municipal offices approached from the town hall by a staircase at the north-east corner. An approach to the basement will be made from Liou-street, with cask and goods wharf, giving access to a central corridor from which large store cellars open on either side. Those at the Lion-street end will be well lighted, and form excellent workshops, the rest being only lighted by deck lights in the floor of corn exchange. The corn hall is mainly lighted from the roof, the whole north slope of the roof being glazed with double glazing, a space of one foot being left between the glass to deaded the sound of rain, so that the hall may be used for concerts and public meetings. There are also side windows which are more for ventilation than light. The winter ventilation is further secured by large fresh-air tubes in the window-sills, and a series of extraction flues in the centre panels of ceiling opening into a continuous louvred space along the ridge. The exterior towards King-street and the Little King-street side of angle pavilion are to be of Portland throughout, the rest of the exterior being of Suffolk white bricks with Portland dressings, The interior of the hall, of which we hope shortly to give an illustration, is also to be of white brick, with a few terra-cotta red and buff bands. The drawings are now being prepared, and tenders will most probably be invited early in January.

CATHEDRAL AND MONASTIC PRECINCTS.

The plans which I now submit to your readers form the complement of a series which from time to time has appeared, mainly in your columns, but partly in various publications, and (as my gift) in "Black's Guide to Wales." St. David's is reproduced from a plan made more than a century and a half since. Wells, from a MS. plan of Bronne Welles, and the communications of a learned resident in that city, who, it is to be hoped, will one day give at least a portion of his invaluable collections to the press. Hereford, Exeter, and Lichfield are shown, with their old buildings complete.

HALF TIMBERED DWELLINGS IN COVENTRY AND WARWICK.

See article on "Scraps of Half Timbered Work," on p. 625.

NEW HIDE, SKIN, AND FAT MARKET, NOTTINGHAM.

A description of this market appears on p. 625.

CHIPS

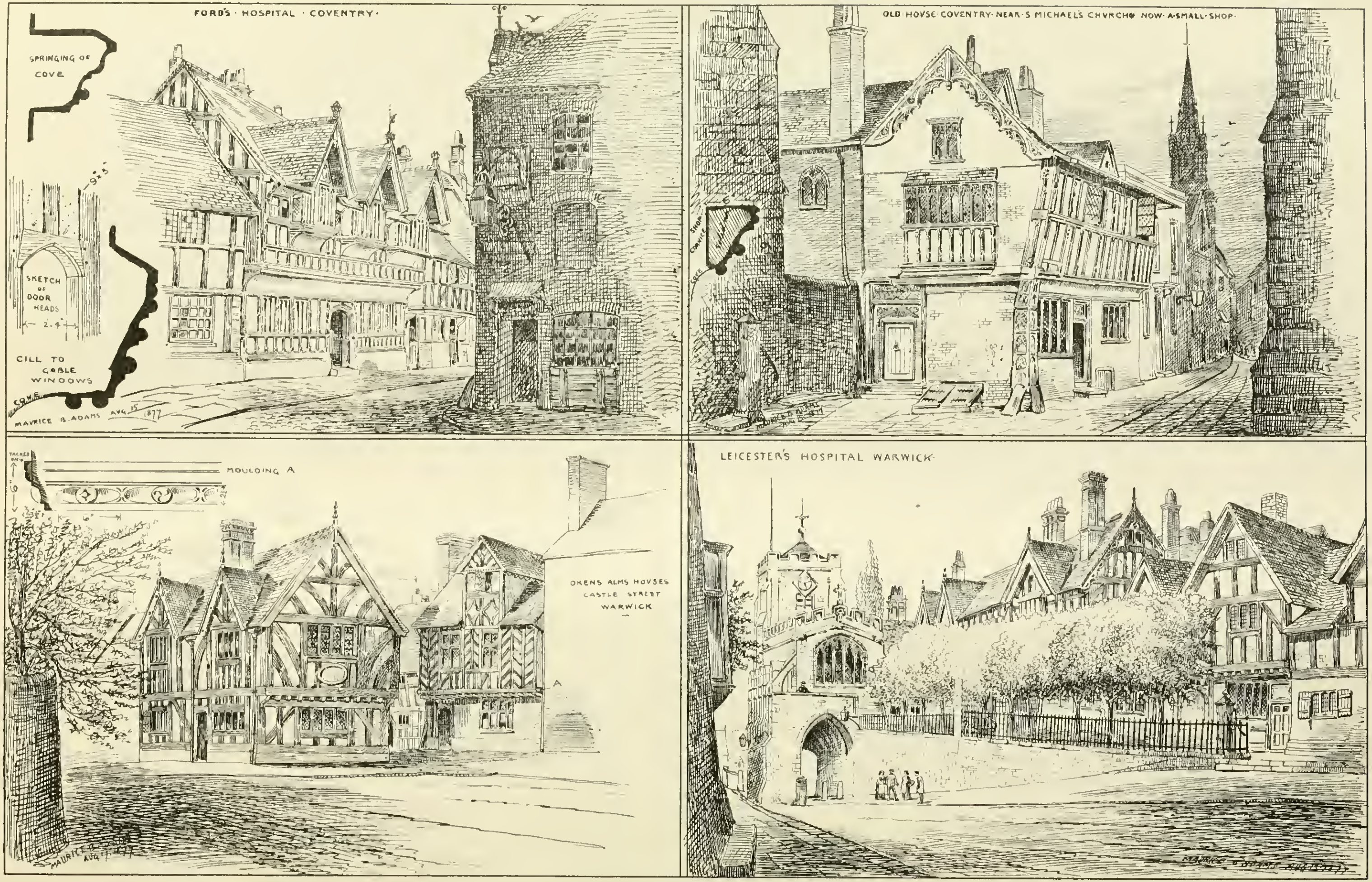
A new cemetery has just been completed at Syston. The buildings consist of a central gateway, with a chapel, &c., on each side. They are Gothic, built of red bricks and Ketton stone dressings, Bath stone being used for all internal masonry. The architect was Mr. A. Ardvou, of Leicester, and the contractor Mr. M. Hicking, of Syston, the contract being for £2,035.

The memorial stone of a new Roman Catholic chapel in course of erection at Kirkoswald, Ayrshire, was laid on the 4th inst. The new chapel, which is Gothic, is designed as much as possible in the same spirit as the ancient chapel of St. Oswald, K. and M. (in ruins), about 200 yards distant, and will be dedicated to the same Saint. It was on occasion of John Knox smashing the Crucifix, overturning the altar, and launching out into a tirade against the Mass in old St. Oswald's, that the last abbot of the neighbouring Benedictine monastery of Crossraguel challenged Knox to a public dispute in an inn at Maybole, and, according to the *Tablet*, "gave him such a thrashing that he never showed face again in this part of the country until after the abbot's death." The new chapel is 45ft. long by 15ft. broad, has a small sacristy attached, and will have eighty sittings.

The spire of the new church of St. Mary Abbots, Kensington, was completed on Saturday, when a service was held, and the ceremony of laying the top-stone was performed by the vicar. It was in 1869 that the old church was pulled down, and the edifice now almost finished is considered by many to be one of the late Sir Gilbert Scott's finest works. The stone used is Kentish rag, with Box Ground for the facings and the spire. The total length of the church is 179ft.; the breadth at the transept, 109ft.; the height of the nave, 73ft.; from the ground to the top of the vane on the spire the height is 278ft., the tower being 112ft., the spire 152ft., and the iron vane rising 14ft. above the top-stone, which was put in its place on Saturday. Of the eight old bells three have been recast, and two new ones have been added. Including the expenditure on the bells, the outlay on the tower and spire will be £21,000, and it is estimated that the whole building, church and spire, &c., will, when completed, have cost about £50,000. The works have been executed by Messrs. Dove Brothers.

A correspondent of a daily contemporary says that a fine Norman fresco has just been discovered on the wall of Patcham Church, three miles from Brighton. The subject of the painting is the release of souls from purgatory through the intercession of the Virgin Mary. The fresco is over the chancel arch, and measures 18ft. by 9ft. It is inclosed in an ornamental border, and is divided into three portions. The figures are very numerous, the central panel alone containing 18. The drawing is said to be good, and the colouring well preserved in all the most important parts of the design.

New stores, to be known as the Army and Navy Provision Market, are in course of erection in Regent-street and Heddon-street, W., from the designs of Mr. A. Bedborough.


FORD'S · HOSPITAL · COVENTRY ·

OLD HOUSE · COVENTRY · NEAR · S MICHAEL'S CHURCH · NOW · A SMALL · SHOP ·

OKENS ALMS HOUSES CASTLE STREET WARWICK

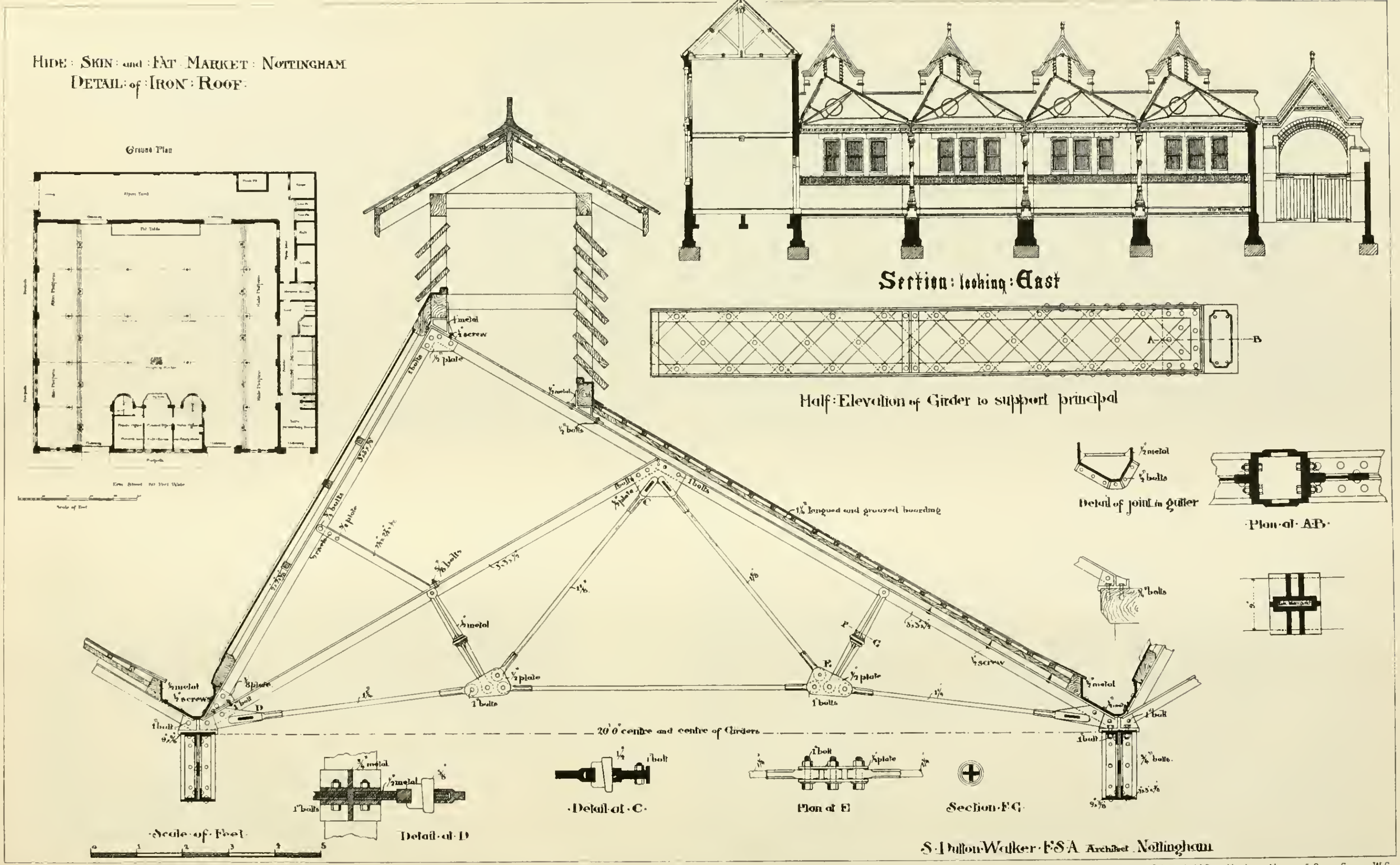
LEICESTER'S HOSPITAL WARWICK ·

SCRAPS OF OLD HALF-TIMBER-WORK.

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C

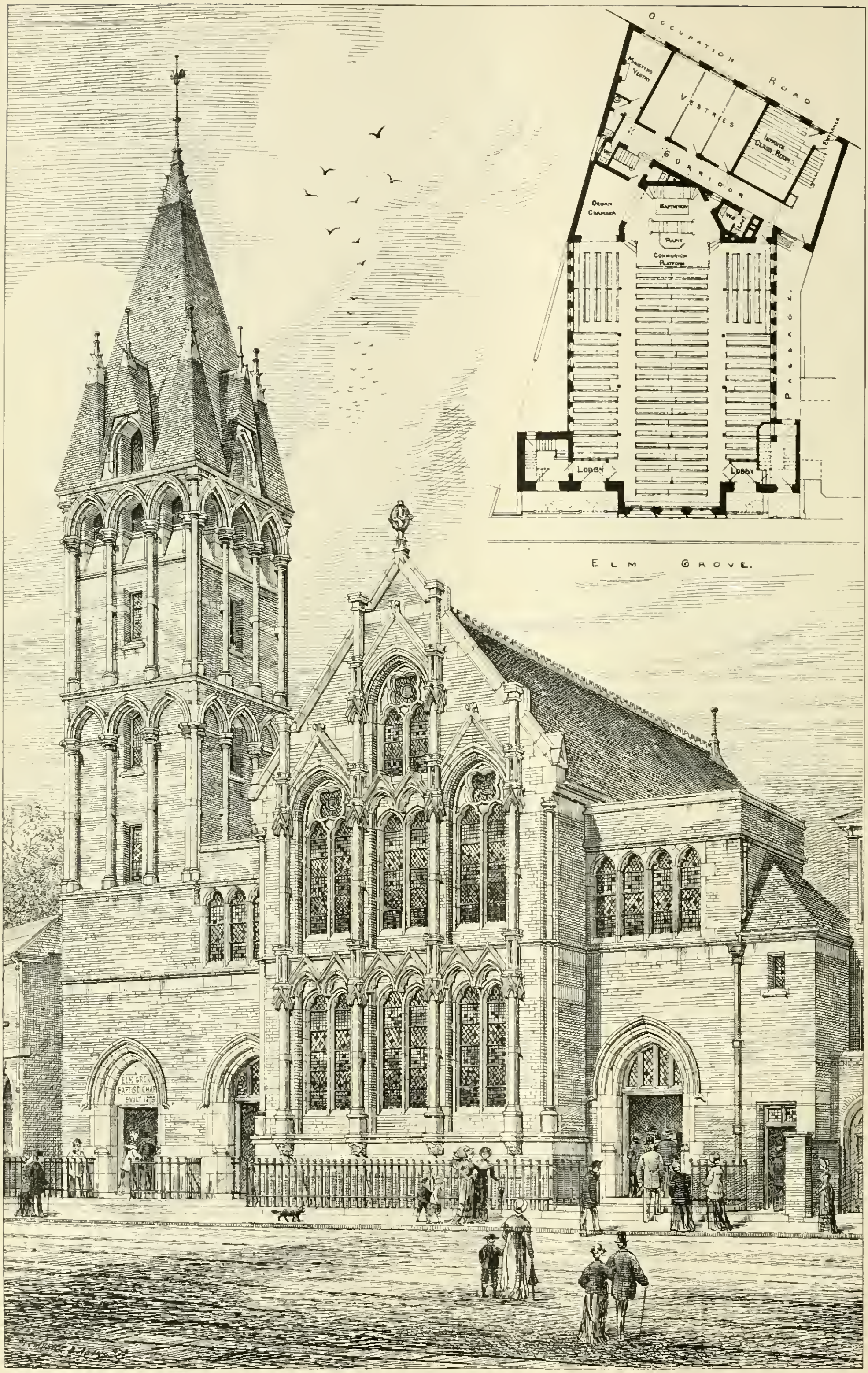
THE BUILDING NEWS. NOV. 21 1879

HIDE : SKIN : and : FAT : MARKET : NOTTINGHAM
DETAIL : of : IRON : ROOF

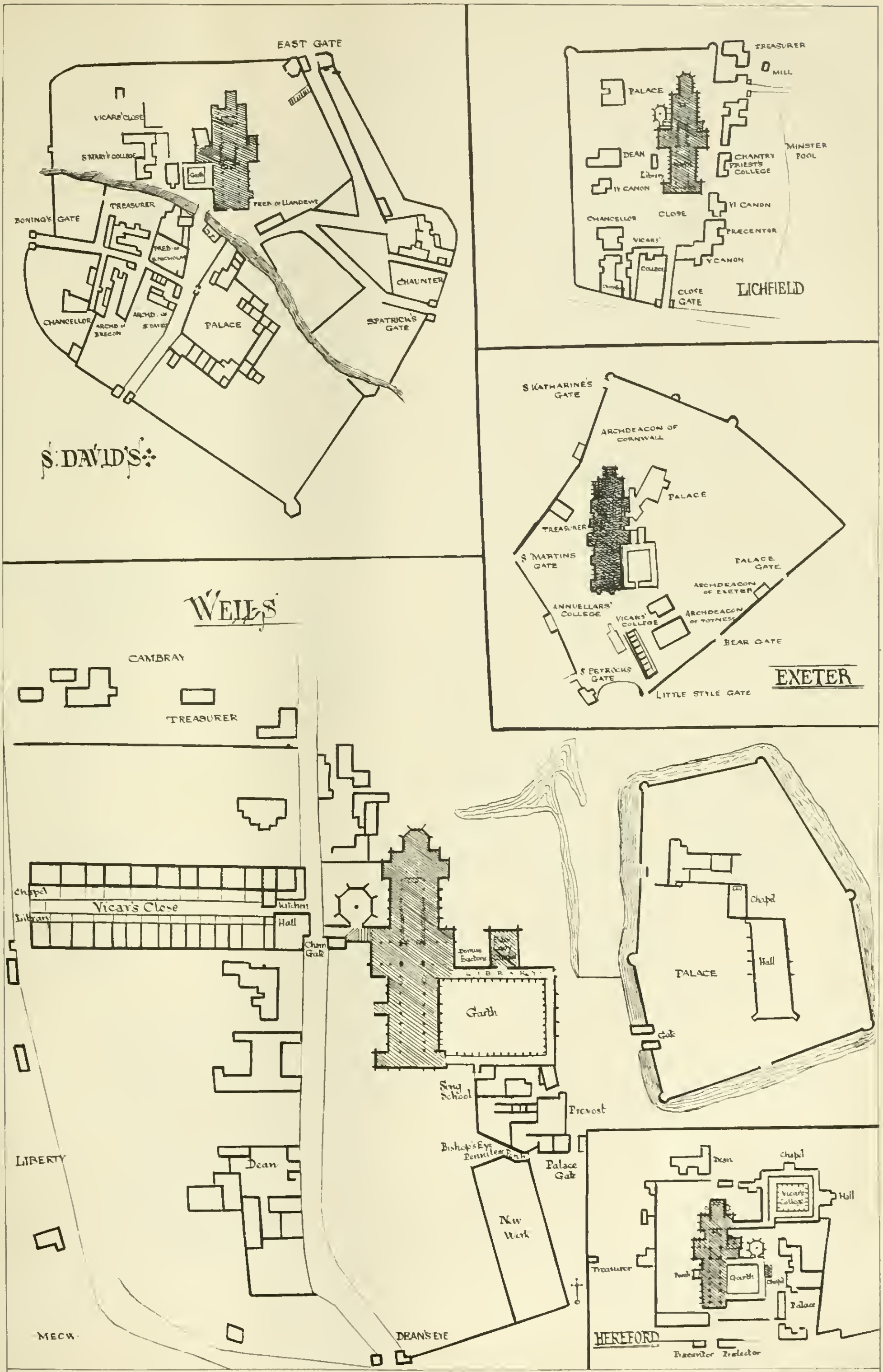


S. Dutton Walker F.S.A. Architect. Nottingham

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



Elm·Grove·Baptist·Ch·SOUTHSEA· H·J·Paull·F.R.I.B.A.& A·A·Bonella·ARCHTS



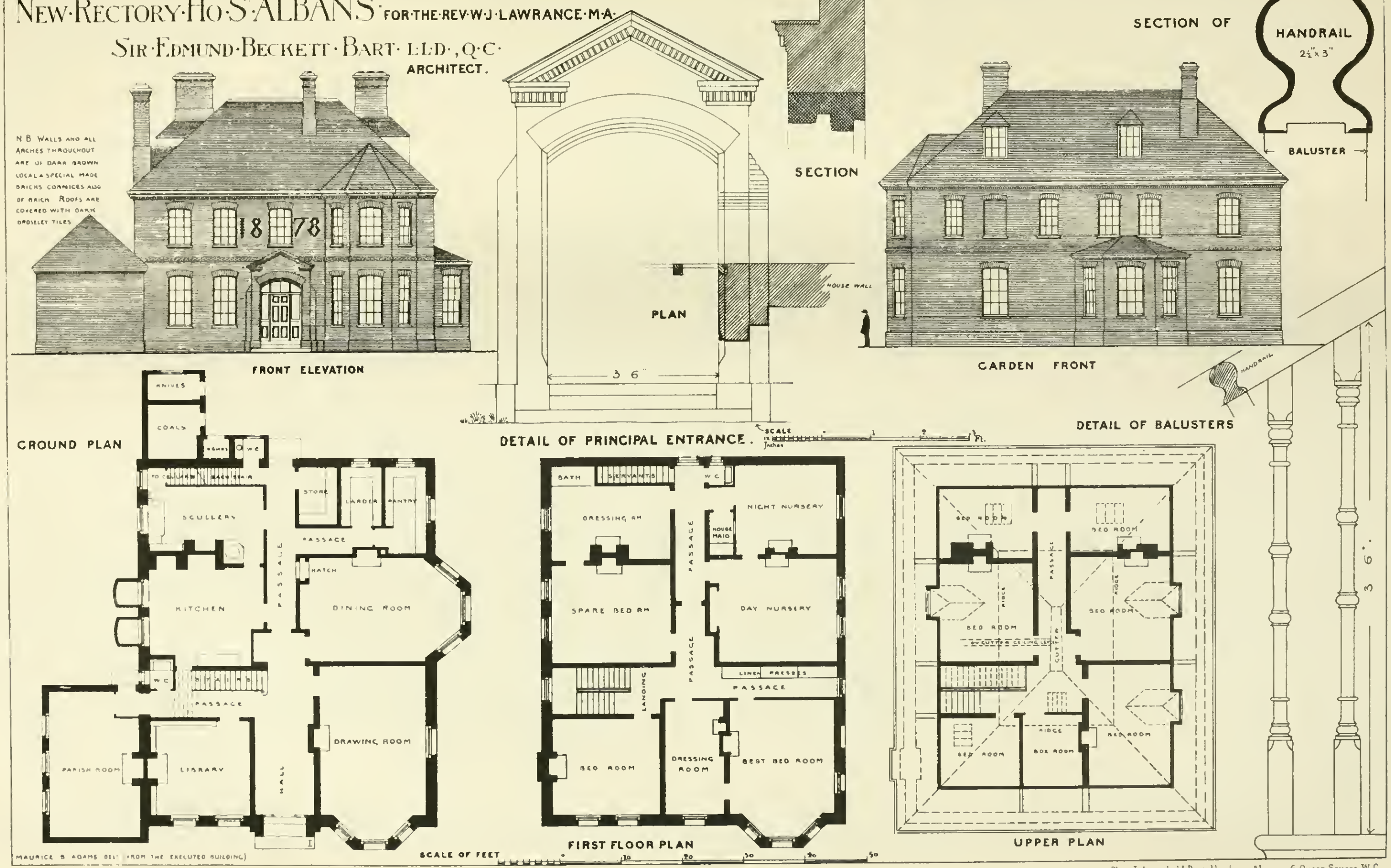
PLANS OF CATHEDRAL AND MONASTIC PRECINCTS

Photo-Lithographed & Printed by James Akerman 6 Queen Square W.C.

NEW·RECTORY·HO·ST ALBANS· FOR·THE·REV·W·J·LAWRANCE·M·A·

SIR·EDMUND·BECKETT·BART· LL·D·, Q·C·
ARCHITECT.

N.B. Walls and all Arches throughout are of dark brown local & special made bricks cornices also of brick. Roofs are covered with dark Broseley tiles



MAURICE B. ADAMS DEL. (FROM THE EXECUTED BUILDING)

Photo Lithographed & Printed by James Akerman, 6 Queen Square, W.C.

Ipswich Corn Exchange & Shops

Selected Design

Brightwen Binyon, A.R.I.B.A.
Architect

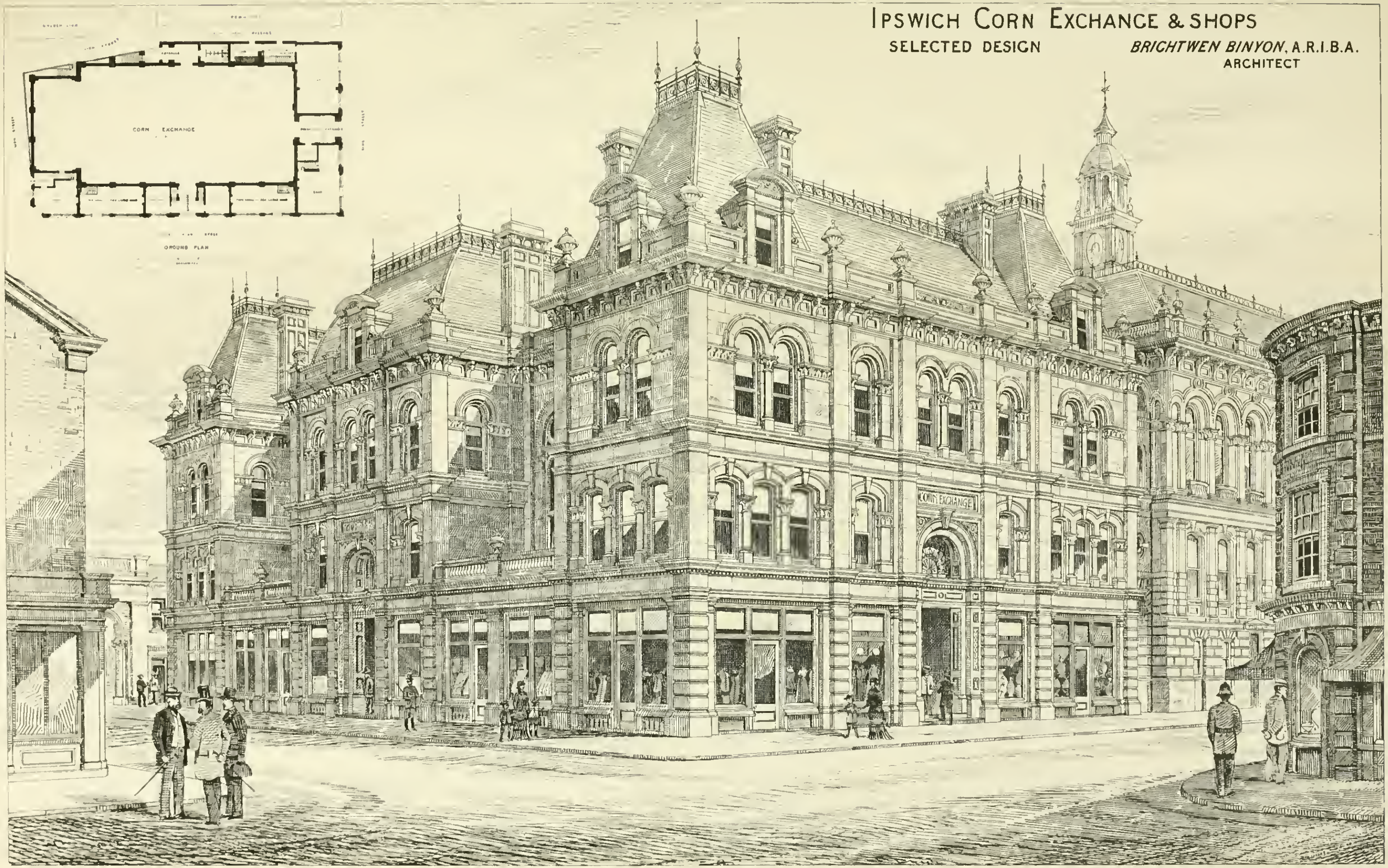


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

SCRAPS OF OLD HALF-TIMBER WORK.

THESE four sketches from Warwickshire were made in 1877 on the occasion of the Architectural Association's excursion to Warwick and the neighbourhood. A report of the meetings, written by Mr. J. Tom Burgess, F.S.A., was published in the BUILDING NEWS for August 24th, 1877, when some particulars of the buildings visited were given. Ford's Hospital, at Coventry, erected in 1529 by Wm. Ford, and shown by the first sketch, is perhaps one of the most perfect buildings of its kind now remaining in England, while the character of the work is exceptionally good. The barge-boards are figured in Pugin's "Ornamental Gables," and the whole building was fully illustrated by a beautiful set of measured drawings, the work of my friend, Mr. Ed. J. May, in the BUILDING NEWS of August 31st, 1877, when an account of the hospital was given. Those who sketch "Ford's Almshouses," as the people in the neighbourhood call the building will "hardly ever" forget what "garlic-savoured neighbours" "Ford's widows" enjoy, for, like many similar institutions, it occupies a site in an exceedingly dirty and low part of the town. The old house also at Coventry shown by sketch No. 2, is evidently the work of the same builder as Ford's Hospital, indeed the details are almost precisely similar. It is a singularly quaint example, and probably is but a fragment of a much larger building. The carved and massive post at the angle is wrought to the original twist of the tree, the upper projection being used as a stop for the shallow cove which forms the cornice carrying the projecting upper floor. This part of the house, however, has no doubt bulged, and of course was originally upright. The building adjoins St. Michael's Church, the buttress of the tower being seen in the view, while the spire-capped building in the rear is some Roman Catholic institution designed in the very florid Gothic peculiar to its author, the late Mr. Pugin. Oxen's Almhouses at Warwick is a very simple specimen of half-timber, the detached house really being a recent re-erection of not much interest, but the small building to the right is in its original condition and is worthy of attention. The effective verge moulding has the not unusual thumb enrichment with a capping piece tacked on. The fourth sketch shows a general view of Leicester's Hospital (Leycester's as it was formerly called), an interesting series of half-timber buildings formed round a small quad, at angle of which is a quaintly devised staircase to the gallery and first floor. The "Brothers" give a very graphic account of all the wonders recorded in history in connection with the place, and show a series of black jacks, and other similarly uncomfortable-looking utensils which enrich the walls of their common room. The whole place is begrimed with the usual treacly kind of brown varnish used on old timber erections, and the buildings have a very over-restored appearance. The whole, however, is remarkably picturesque, and the beautiful chapel over the roadway, carried by a pointed arch, gives a unique character to the street. The chapel has recently been well restored by Mr. Garner (Bodly and Garner), who introduced new stalls and open screen of carved oak at the west end. The new stained glass in the east window is also very bright and good. Few towns of the size of Warwick present more of interest to the architect and antiquary, in spite of the indifferent hotel accommodation, and although a vast fire in 1694 consumed the greater part of the town, including the nave and west end of St. Mary's Church. This building was, however, re-erected by Sir William Wilson, a freemason of some note in the locality, in 1700, the style being a strange mixture of Classic and Gothic detail. The beautiful Beauchamp Chapel, of Late 14th Century date, is in every way a singularly fine example, and contains a splendid Elizabethan tomb to the Earl of Leicester. It is now only used as a show place, and is very dirty. A fine drawing of this chapel, by Mr. J. Langham, was published in the BUILDING NEWS as a double-page plate on Dec. 21, 1877.

MAURICE B. ADAMS.

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An inquiry was held at Hindley, near Wigan, on Tuesday, before Major Tulloch, R.E., one of the inspectors of the Local Government Board, with respect to an application from the Local Board for sanction to borrow £40,000 for street improvements, gas, and fire brigade purposes.

THE NEW HIDE AND SKIN MARKET, NOTTINGHAM.

THIS building, which has been erected from designs prepared by Mr. S. Dutton Walker, F.S.A., of Nottingham, covers an area of 120ft. each way, and its principal elevation faces a new street, 80ft. in width, recently formed by the corporation of Nottingham. The style chosen is Gothic, very freely treated, to accord with modern business requirements; the external aspect is neat and substantial, and free use has been made of ornamental enriched red terra-cotta mouldings and string-courses, manufactured by the Whitwick Colliery Company, near Leicester. This terra-cotta work, while inexpensive, greatly adds to the effect of the elevations, and the architect cordially recommends this material to his brother professionals. Entering by one of the large archways on the north side, we find ourselves in a large market, which, at a first glance, we might suppose to be a modern railway-station, the cast-iron columns and the light iron roof greatly favouring such a supposition. On referring to the plans, it will be seen that the east side of the market is reserved for sheep-skins, and the opposite side for hides, and at the south end a space is reserved for the "fat" market. The floors upon which the hides and skins are deposited are made of impervious hard blue bricks, laid on edge in cement, upon a substratum of concrete 8in. thick, the floors being laid to a very steep gradient for washing and sluicing purposes. The walls, to the height of 7ft., are faced internally with white enamelled bricks, manufactured by the Farnley Iron Company; thus it will be seen that both walls and floor can be scrupulously washed at frequent intervals; in fact, throughout, most special attention has been paid to the sanitary condition of the building. Reference to the section will show the systems of ventilation and light. The market is kept cool by louvre ventilators at the various ridges; light is admitted on the north side only of the ridge and furrow roofs, so that little or no sunshine can enter the building. The south sides of each roof are covered with felting, boarding, and slates, to keep out the heat. The centre part of the building is paved with 4in. Mount Sorrel granite cubes, bedded on an 8in. bed of concrete, all laid to falls and proper gradients. To this part of the market, drays, waggons, and vans are admitted for the conveyance of the various articles which are here on view for sale. The official part of the market is upon the north side, and comprises clerks' entering-room, clerks' account-room, secretary's offices, &c., while above, on the second story, the whole is thrown into one room, which is used both as a board-room and sale-room. These various rooms are fitted up substantially with mahogany desks and other fittings, and are heated by hot water. The clerks' account-room has a glazed bay-window, by which the whole of the market can be supervised, and this is also used as a pay-window, for the settlement of accounts and payment of workmen's wages. There are gateways for the entrance of carts, &c., and others in the rear for exit, and thus no impediments are caused, and no confusion arises. On the west side of the market the stabling is placed, at present arranged for six horses. Yards are arranged on each side for air and light, also for washing the horses, for manure and straw-pits, &c., and above are hay and corn stores. There are also other out-buildings requisite for the business, such as washpits, stove lime-pits, salt-houses, &c. The contractors were Messrs. Lees Brothers. The market has been built by the order of the Bridge Committee of the Nottingham Corporation, and is let on lease to the Nottingham Hide, Skin, and Fat Market Company, Limited. It is approached by good roads, is very conveniently situated, both with respect to the Great Northern and the Midland Railway stations, and is considered by good authorities to be the best-arranged market in the kingdom, both as regards business and also sanitary arrangements, a proof of which may be given when it is stated that deputations from many towns have visited the market, preparatory to the erection of other buildings of a like character. The architect is, as we have already said, Mr. Dutton Walker, and the consulting engineer is Mr. M. O. Tarbotton, F.G.S., also of Nottingham.

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A new Theological College is about to be built at Ely. Mr. Brown is the contractor.

ALL SAINTS' CHURCH, MAIDSTONE.[*]

I HAVE learned with sorrow and with surprise that it is proposed to alter the existing arrangement of the organ of All Saints' Church. As one whose family belongs to the neighbourhood, and who is himself a frequent guest in Maidstone, I may perhaps be allowed to express the profound regret with which I have heard of this proposal. The restoration of All Saints' Church, so far as it has at present proceeded, is not perhaps upon the whole a great success, although it is the fashion to criticise it more severely than, in my opinion, it deserves. But whatever faults may be found with the work generally, in the arrangement of the organ the architect has been singularly successful. Our ancient churches were not planned to contain organs, except of a very small size, and there is, therefore, very great difficulty in introducing a large instrument into an old building without disfigurement to the interior. This problem has been solved with unusual felicity in All Saints' Church, and I have on more than one occasion adopted the same plan, and have been happy to be able to refer to All Saints', Maidstone, as an instance of the success of such arrangement both from the architectural and musical point of view. I had occasion only a few months back to refer to the success of the organ arrangements of All Saints', in the case of a large church in Yorkshire in which I am following the plan first suggested to me by Maidstone parish church. I may add that the organ-case is a particularly beautiful design, which is more than can be said of most of those of the present day.

There is no doubt that, musically, a great organ is a great evil. The almost colossal instruments now in vogue cannot be, and never are, kept throughout in tune, and the result is very much noise and very little music. The perfection of an organ is surely an instrument of moderate size, fine quality, delicate voicing, and kept strictly in tune. Of course "there is nothing like leather" to a cobbler, and organ builders and organists may perhaps be pardoned for thinking, as they appear to do, that churches and congregations exist for the sake of being filled and deafened by organs. No organ builder is really happy as long as there is a bigger instrument than his in Christendom, "*Nil actum reputans dum quicquid restat agendum.*" Interest pulls the same way with the natural zeal which a man has for his own craft. It sometimes happens that the builder looks forward to large profit, or the organist to a large commission, and so pedal pipes grow till you might drop the Tichborne claimant down them and stops become yearly more numerous; and when, *vox humana* ,and *vox cœlestis*, and *vox angelica*, and fifty others have been added, the organo-maniac still sighs for an echo-organ or perhaps for a *vox diabolica*.

The interior of All Saints' Church is, to my mind, surpassed by few parish churches in England. Its great and striking characteristic is its symmetry. The nave has on either side an immense aisle, the chancel has similarly on either side a narrower aisle, of about one half the width of the nave aisles. Thus nave and choir form each of them in plan a square, and the wonderfully impressive effect of the interior is due entirely to these proportions and to this symmetry of plan. These would be lost at once if one of the chancel aisles were to be blocked up by a huge organ, and I must express my deep regret, both as an architect, and as one who is connected with your town, at hearing of this proposed change, so disastrous to the beauty of the church and so uncalled for. Maidstone church has suffered much from ill-advised alterations. In the last century its roof was concealed by incongruous plaster-work. In the present century its noble windows have been disfigured by a collection of stained glass some of which, I fear, may almost be described as the worst in the kingdom.[†]

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[*] From the *Maidstone and Kentish Journal.*

[†] The ancient windows are divided by ironwork into *ten* compartments in the height. Of these *four*, as is clear from the arrangement of the glazing panels, were occupied by the *predella* or small lower subject of the original stained glass, and the upper six by the principal figure and its canopy. The new windows with ingenious perversity are divided, some into *five* and some into *seven* compartments, in entire disregard of the original arrangement of the painted glass. More than this, the ancient ironwork, coeval with the church itself, which once supported the old stained glass, has been ruthlessly cut out, and galvanised wire guards inserted in its stead. The effect of the exterior of the windows so treated is utterly ruined. The ironwork forms as much a portion of the design of an ancient window as the tracery itself, and it is as great a vandalism to cut out the one as to remove the other.

Let us hope that the effect of the church's noble proportions, so far spared to us, is not now, in the last quarter of the nineteenth century, to be sacrificed to a passing mania for monster noise-machines.

G. Gilbert Scott.

31, Spring-gardens, Nov. 1.

THE ART OF ARCHITECTURE.

MR. JOHN P. SEDDON, according to *St. Luke*, delivered a lecture on the 10th inst. in St. Mark's School-room, Reigate, on "The Art of Architecture," tracing its historical rise and progress from its Oriental origin and intellectually perfect development by the Greeks, to its perversion and consequent decline in the hands of the less artistic but bold and grandly constructive Romans. Then, again, from the common sense and more spiritual revival by the early Christians, and growth by sure but slow degrees according to true principles successively at Rome and Byzantium; stimulated by the power and zeal of Charlemagne till it attained to the vigour and energy of the full Romanesque style as seen in the sturdy work of the Norman conquerors of England. Afterwards he sketched the wondrous rise and development of the Pointed Gothic, and described the characteristics of its successive periods known as Early English, Decorated, and Perpendicular, in our own country, and its corresponding phases on the Continent, until it, in its turn, fell into decay and was superseded by the Chaos of the Renaissance, with the falseness of Roman rather than the purity of the Greek as the type selected for imitation. The varieties of Roman, Florentine, and Venetian Italian were pointed out, and the stages of the struggle of Mediæval and then Classical elements in our own Tudor, Elizabethan, Jacobean, and Queen Anne, which led step by step to the depths of Hanoverian Bathos, till the eclectic work of the present day represented the extinction of architecture as a living art. In conclusion he pointed out that individual rather than collective excellence must be hoped for, and that its attainment was only to be achieved by fulfilling the requirements of the age in the purest and best architectural language to be gleaned from the works of past ages and the true principles of beauty learned by attentive study, but not close imitation of Nature.

A CYLINDER OF CYRUS THE GREAT.

ON Monday Sir Henry C. Rawliuson read an important paper before the Royal Asiatic Society on "A Newly-discovered Cylinder of Cyrus the Great," which he described as the most interesting historical record in the cuneiform character as yet brought to light. It was not among the monuments lately brought home by Mr. Hormuzd Rassam himself, but must be credited to his last archæological explorations in the East, under the auspices of the British Museum, having been sent to this country by one of the agents left behind by him to continue his excavations in the Mesopotamian mounds. It is in the Babylonian script, as was to have been expected from its having been discovered among the ruins of the Birs Nimroud, the acknowledged site of the ancient Borsippa, of which city, as Sir Henry Rawlinson remarked, it was the more surprising that it makes no mention. The cylinder is 9in. long, by 3¼in. in diameter, and must originally have been covered with forty-five long lines of text. The writing is very minute, and it is computed that the inscription would run to about 130 lines of the average length. Unfortunately, the monument is very badly injured, and the beginning is wholly lost, with the exception of a few scattered signs. When it does begin to be legible it is found to relate to the very moment of that great historical event, the capture of Babylon by the founder of the Persian Universal Monarchy. Nabonidus has abandoned his capital, which has fallen into the hands of Cyrus, though he is still struggling against his fate in Babylonia. But the priestly worshippers of the rising sun declare that the gods have rejected him for his impiety and for his scandalous neglect of their temples. On the other hand, they extol the piety and the greatness and glory of Cyrus, whom the heavenly powers have raised up to avenge their cause. The Guti, whose overthrow Sir Henry Rawlinson thinks was involved in that of the Medes, and a people whose name is taken to be equivalent to Blackheads, reminding us of the Negroes, are described as his subjects, and the god Merodach has delivered King Nabonidus into his hands. Of Belshazzar no mention is discoverable, although it is conceivable that this may be due to the many and serious gaps in the inscription. The long introduction is followed by what purports to be the text of a proclamation issued by Cyrus upon the taking of the city, and in which the King repeats in the first person the principal allegations of the preamble. It is partly mutilated, but the beginning, "I am Cyrus," with his genealogy in full, and his description of himself as "King of Gyndia," &c., can be pretty clearly made out, and Sir Henry gave a translation of all that is legible. Cyrus is made to speak of his reparation of the temples of Babylon, and of the favours conferred upon him by Merodach, Bel, and Nebo in answer to his prayers to them, of the homage paid him by distant nations, and of the gatherings of the people in the city to acclaim him king. The last ten lines are illegible. Sir Henry Rawlinson said this new text settled for ever, in favour of Herodotus as against Ctesias (in Diodorus), the genealogy of Cyrus. He was fifth in descent from Achæmenes, next to whom came Teispes, Cyrus, then the grandfather, and Cambyses, the father of Cyrus the Great. Moreover, the succession was direct, not indirect, as Professor Oppert had maintained. The inscription styles the native country of the Persians "Assan," which Sir Henry Rawlinson gave reasons for locating in the plains between the modern Shuster and the Persis of the classical writers. He gave an interesting account of the great temples of Babylon. An important religious centre named Calana in the inscription he illustrated by reference to the Calneh of Genesis and the Calno of Isaiah. The great difficulty, he said, in the inscription was the transformation of the Royal zealot of Aurumazda into a devotee of the Babylonian gods.

THE SOCIETY OF ARTS.

THE 126th session of the Society of Arts was opened on Wednesday evening by an address by the Chairman of the Council, Lord Alfred S. Churchill, who sketched the history of the Society since its establishment, and claimed, that while the Society was ready to act as the pioneer only in many fields of labour, it had a special field of its own in the applications of science and of art to practical purposes. He had little sympathy with the fashionable talk about the dignity of science and the necessity of following science, not for its results, but for itself. Knowledge apart from results would be but a barren possession. True, we must pursue science without looking for an immediate reward; but that is because we know that the reward will come sooner or later. Passing on to speak of the congresses of the past few years on sanitary matters, he asserted that the great attention drawn to these subjects of recent years had been almost entirely due to the efforts of the Society. The speculative builder had begun to find out that one of the most attractive points in a house was, that it was well supplied with the newest sanitary fittings. Drains were ventilated, proper appliances supplied, and the houses in course of erection to-day were, the speaker believed, twenty or thirty per cent. better than the houses built half-a-dozen years ago. Notwithstanding this conviction, however, Lord Alfred intimated that the council were considering the question of repeating the annual conference, and that it might be considered desirable to omit it for a year, in the hope that more fresh material would be likely to be available for discussion after a longer interval. Should it be held, it was probable that the scope of the conference would be enlarged so as to include all subjects relating to national health. As the result of a correspondence between the Society and the City Lands Committee, the Corporation had undertaken to erect memorial tablets in the City of London if suitable names were submitted to them by the Society. In the announcements of meetings for the ensuing session, attention was drawn to the third course of Cantor Lectures which will be given in the latter part of the session, when Mr. R. W. Edis, "who was known both as a writer and practical architect," would deliver a series on "Art Decoration and Furniture." In concluding, the chairman mentioned that the committee of the council had under consideration the renovation of the meeting-room, and also the question of the possibility of providing increased accommodation for meetings, and asked for the hearty co-operation of the members in all the objects of the Society.

A RECORD OF GREAT FIRES.

HISTORY is full of accounts of the devastation caused by fire in the cities and towns of nearly every country of the civilised world. A record of these conflagrations cannot but be of interest. In the year 798 London was almost entirely destroyed by fire, and again in 982 the greater part of the city burned. In 1086 all houses and churches, from the East to the West Gate, burned. What is known as the "great fire" occurred in 1666. It began September 2, and continued three days, burning over 436 acres. Houses to the number of 13,200, including many public buildings, were destroyed, and six persons were killed. The loss was estimated at 50,000,000dols. In 1794, 600 houses burned; loss over 5,000,000dols. In 1834 the Houses of Parliament were destroyed; 1871, Tooley-street warves burned, entailing a loss of 10,000,000dols; in 1873 Alexandra Palace was destroyed. The great fire at Edinburgh occurred in the year 1700. At Brest, France, in 1784, explosion and fire in a dockyard caused a loss of 5,000,000 dols. Paris (Communists' devastations), 1871, 160,000,000 dols. A fire at Rome in the year 64 lasted eight days, and ten of the fourteen wards of the city were destroyed. Venice, Italy, was almost wholly destroyed by fire in 1106, and in 1577 the greater part of the city was ruined by an explosion during a fire at the arsenal. Leipsic, Germany, in 1420 lost 400 houses; 1491 Dresden, Germany, was destroyed. In 1811 forest fires in Tyrol destroyed 64 villages and hamlets. In May, 1842, at Hamburg, a fire raged one hundred hours; during the fire the city was in a state of anarchy, 4,219 buildings destroyed, one-fifth population homeless, and 100 lives lost; total loss, 35,000,000 dols. After the fire contributions from all Germany came in to help rebuild the city. At Copenhagen, in 1728, 1,650 houses burned; 1794, Royal Palace, with contents, destroyed; 1795, 1,563 houses burned. At St. Petersburg, in 1736, 2,000 houses were burned; the great fire occurred in 1862, when the loss was 5,000,000 dols. In 1753, at Moscow, 18,000 houses were burned. On Sept. 14, 1812, the Russians fired the city to drive out Napoleon. The fire continued five days, and nine-tenths of the city were destroyed. The number of houses burned was 30,800, and the loss was 150,000,000 dols. At Constantinople, in 1729, a fire destroyed 12,000 houses and 7,000 persons. In 1745 there was a fire which lasted five days; January, 1750, 10,000 houses burned; April, same year, loss 10,000,000 dols.; later, same year, 10,000 houses destroyed; 1751, 4,000 houses destroyed; 1756, 15,000 houses and 100 persons; years 1761, 1765, and 1767, other great fires; 1769, 1771, and 1778, great fires; 1782, fire burned three days, 10,000 houses and 100 lives lost; February, same year, 600 houses; June, 7,000; 1784, 10,000 houses; 1791, between March and July, 32,000 houses burned; same number in 1795; 1707, in suburb of Pera, 13,000 dwellings, and many magnificent buildings destroyed; 1861, August 16, 12,000 houses and 3,000 shops in finest quarter were destroyed; 1818, August 13, fire destroyed several thousand houses; 1826, 6,000 houses; 1848, 500 houses, 2,000 shops, loss estimated 15,000,000 dols.; 1865, great fire destroyed 2,800 houses and public buildings, 22,000 persons left homeless; 1870, June 5, the suburb of Pera, occupied by the foreign population and native Christians, was swept by a fire which destroyed over 7,000 buildings, many of them among the best in the city, including the residence of the foreign legations; loss estimated at nearly 25,000,000 dols. Scutari, Greece, 1797, 3,000 houses burned. Smyrna, Greece, 1763, 2,600 houses consumed; loss, 1,000,000 dols.; 1772, 6,000 houses; 1796, 4,000 shops; 1841, 12,000 houses. Yeddo, Japan, 1872, six square miles burned over, 20,000 persons homeless; 1873, 10,000 houses destroyed.

At Boston, Mass., 1679, all the warehouses, 80 dwellings, and vessels in the dockyards were consumed, loss 1,000,000 dols.; 1760, fire caused loss of 500,000 dols.; 1787, 100 buildings destroyed; 1794, 96 buildings burned; 1872, great fire November 9 and 10, the richest part of city destroyed, an area of 65 acres burned over, 776 granite and brick buildings consumed, loss 75,000,000 dols. Charleston, S. C., 1778, fire caused the loss of 500,000 dols.; 1796, 300 houses burned; 1838, one half of city burned, loss 3,000,000 dols. Savannah, Ga., 463 buildings, loss 4,000,000 dols. New York, 1835, 530 buildings in business centre of city destroyed, 52 acres burned over, loss 15,000,000 dols.; 1845, 300 business blocks, 35 persons killed, loss 7,500,000 dols. Pittsburgh, 1845, 300 buildings destroyed, loss 10,000,000 dols. Albany, 1848, 600 houses burned, loss 3,000,000 dols. St. Louis, May 17, 1849, 15 blocks, 23 steamboats, loss 3,000,000 dols.; May, 4, 1851, three quarters of the city burned, 2,500 buildings, loss 11,000,000 dols.; same year 600 houses, loss 3,000,000dols. Philadephia, 1850, July 9, 400 buildings burned, 30 lives lost, loss 7,000,000dols.; 1865, 50 buildings burned, 20 persons killed, loss 500,000dols. Washingto, 1852, part of Capitol and whole of Congressional Library burned. San Francisco, May 4 and 5, 1851, 2,500 buildings and a number of persons burned, more than three fourths of city destroyed, loss 10,000,000dols.; June, same year, 500 buildings, loss estimated at 3,000,000dols. Chicago, 1857, 14 lives, 500,000dols.; 1859, September 15, 500,000dols.; 1866, August 10 and September 18, 500,000dols. each; 1871, the greatest fire of modern times, October 8 to 10, 2,124 acres, or 3½ square miles, burned over in the very heart of the city, 250 lives lost, 98,500 persons made homeless, and 17,430 buildings, one third in number and one half in value of buildings in city, consumed, loss estimated at 190,000,000dols. Troy, N.Y., 1862, nearly destroyed by fire. Portland, Me., 1866, great fire of July 5, one half of the city burned, 50 buildings blown up to stop the progress of the fire, loss 11,000,000dols. Quebec, 1815—1816, 1,000,000dols; 1845, May 28, 1,650 houses burned, one-third population made homeless, loss 3,000,000 dols; another fire, June 28, 1,300 dwellings, 6,000 persons made homeless, loss 1,000,000 dols; 1866, 2,500 houses and 17 churches in French quarter burned. St. John's, N.B., 1837, January 13, 115 houses and nearly all the business part of the city burned, loss 5,000,000dols.; 1877, June 21, 200 acres burned over, 1,650 dwellings, 18 lives lost, total pecuniary loss, 12,500,000dols. St. John's, Newfoundland, 1846, loss 5,000,000dols. Montreal, 1850, June 7, 200 houses in finest part of city burned; 1852, July 9, 1,200 houses burned, 10,000 persons destitute, loss 5,000,000 dols. Santiago, South America, fire in the Jesuit church, 2,000 persons perished.—*American Fireman's Journal.*

LONDON STATUES.

THEY are many of them old acquaintances, writes Mr. E. Ingress Bell, in the *Magazine of Art*, and "seen too oft, familiar with their face, we pity first." They have been so often the butt of the critic that it seems almost cruel to join in the hunt and run them down. They are, moreover, outcasts. They have no friends. They are the deserted children of this great city. Let us at least hear what is said in mitigation of their grotesque appearance and their woe-begone and forlorn condition generally.

Their authors plead the costume of the time. The climate. Admitted. The absence of out-door life in ennobling forms. The tendency of the pursuits of the age to perpetuate ignoble traits. All of these are no doubt difficulties. But have the sculptors made the most of the opportunities left to them? Are there not some points in their practice capable of improvement, even if the improvement of their subjects is beyond their reach? The bulk of our sculpture will in future probably answer to the painter's easel pictures, and will be portrait sculpture in some shape, and of this portrait statues to our public men will form a considerable proportion.

We have hitherto apparently felt no incongruity in placing Nelson and the Duke of York out of mortal view, adding a finish to them by way of a spiky lightning conductor, looking as though the peril of their position had set their hair on end. There may be some excuse for thus getting the duke out of sight, but why on earth should the admiral be mastheaded? Thanks to the purer ether and diviner air of cloudland, and to the bleaching sun and rain, Nelson's statue is not so hopelessly begrimed as some of lowlier place. But when near enough to be seen in detail, it is from its position foreshortened out of all possible appreciation of whatever artistic merits it may possess. Seen from a distance it is only a dark mass against the luminous sky, in which the sculptor's work goes for nothing.

The public have, however, long since accepted the conditions with aggravating equanimity, and the puzzled foreigner is informed—"That? That is the Duke of York's column. That is Nelson's column!"

The above anomalies are happily too costly to be often repeated, still a little ingenuity has contrived to invest less costly mistakes with an almost equal absurdity. Our military heroes are scandalously treated. Take the statue of Lord Clyde in Waterloo-place, or that of Sir George Outram in the Embankment Gardens. As statues, and in their sculptors' studios, no doubt well enough. But it was felt essential to their exhibition in public to provide them with pedestals, or something to raise them into public observation, and to show them off to the best advantage. Of course, the less obtrusive and self-assertive the pedestal, the more the attention would be directed to the statue. And how has this necessary accessory been provided? These heroes have been hoisted upon blocks of polished granite. The material in which the figures themselves are cast speedily assumes in our sooty atmosphere a sombre grey, which obliterates all the delicate work of the sculptor, and the closest scrutiny from the nearest accessible point scarcely suffices to reveal the lineaments of the great men whose deeds we honour in the dust. But the pedestal is a brilliant object far and near. Observation, whether with extensive view or not, cannot escape the blinding sheen of the obtrusive pedestal. Worse still—one of these pedestals is actually cylindrical in figure, and carries a line of white light from top to bottom. The "highest light" in the picture falls necessarily and permanently on the unimportant accessory, and carries off the eye from the modest figure, which should be the only thing about it which the eye could not choose but see. There was no need to further dilute the effect by the aid of the lion and the lady at the base. The distraction was complete without them.

The pedestal is the rock upon which the sculptors split. They desire to give something of an architectural character to it and its surroundings, and in few cases do they succeed. The best way is to leave it quite plain, bearing only names and dates. The best material is unpolished *grey* granite, which both in tint and texture gives preciousness to the costlier material and finish of the statue. Long ago Mr. Ruskin asked us to leave a "little architectural silence" about our statues, and every day the wisdom of the advice becomes more and more apparent.

THE BUILDING MATERIALS OF NEW ZEALAND.

MR. W. N. BLAIR, M.Inst.C.E., has sent us a copy of a very interesting book on the Building Materials of Otago and South New Zealand generally, written by himself, and published at Dunedin. It is full of information, cannot fail to be of use to settlers, and should contribute even here towards the development of the resources of the colony. The following particulars of the cost of building in New Zealand will probably be read with interest:—

It is impossible to determine a general rule on the subject of cost and suitability, as they depend so much on the resources of the locality and the purpose in view, not to mention the wider range of individual tastes. The following conclusions are applicable to Dunedin, but they will give at least indications of results in other parts of the Province by making the allowance due to a difference in the value of materials and labour.

It is authoritatively stated that the cost of concrete in London is only one-half that of brickwork for the same thickness of wall, and the béton agglomere sewers in Paris are calculated to have cost 20 per cent. less than any other material procurable of the same quality. It must, however, be borne in mind that in both these places the circumstances are very much in favour of this result. The cementing ingredients are manufactured on the spot, consequently concrete is on a par with brickwork, and has an advantage over stone which comes from a distance. In Otago the conditions are exactly reversed. Brick and stone being in the locality, can be procured at a moderate rate, while cement has to bear the heavy charges inseparable from the importation of a low-priced article. When the manufacture of Portland cement is established in New Zealand, the relative costs of the three building materials will in all probability approach nearer the European proportion. The price of concrete in plain walls, near London, with cement at 8s. per cask, is from 9s. to 11s. 6d. per cubic yard. Béton agglomere in Paris for the same work, with cement at 8s. per cask, hydraulic lime about one-half that price, and labour 3s. per day, costs from 20s. to 24s. per cubic yard. The greater cost of the latter is a proof that there is more labour and care bestowed on its preparation than is done with concrete in England.

The price of concrete for ordinary engineering purposes in Dunedin is about 35s. per cubic yard; and Mr. Petre, who has had considerable practice in building with concrete, informs me that its price in a plain wall is about 41s. 6d.; if to this is added the cost of outside plastering, which is indispensable in any class of dwelling-house, we bring it up to 50s. I am not aware of any building having been erected in Otago in strict accordance with the method adopted in France, so there is no way of getting at the cost from actual experience; but the data at command are sufficient to fix 60s. as a close approximation. In America, the price of béton is estimated at from 36s. to 44s. for labour and materials alone, and those are much cheaper than with us.

The following statement gives the comparative cost of the building in London and Dunedin at the present day:—

	London.	Dunedin.
	s. d.	s. d.
Ordinary brickwork, per cubic yard	22 0	40 0
Concrete	11 0	50 0
Béton agglomere	22 0	60 0
Rough rubble	12 0	27 6
Coursed rubble	18 0	37 6
Freestone ashlar, per cubic foot	3 8	4 6
Hardstone ashlar, rock-faced, per cubic foot	10 0	4 6
Hardstone ashlar, fine-dressed, per cubic foot	11 0	6 6

At those prices, and the standard thicknesses of wall formerly established, the relative cost of building in Dunedin, with the various materials at command, is as follows:—

Brickwork	1.00
Concrete	1.11
Béton agglomere	1.33
Rough rubble	0.91
Coursed rubble	1.25
Freestone ashlar	2.70
Hardstone ashlar, rock-faced	2.70
Hardstone ashlar, fine-dressed	3.90
Ordinary timber-work in walls	0.44

This proportion is not, however, applicable to the whole building, for the value of the masonry is generally less than half the total cost. Furthermore, the high-priced materials are seldom used in large quantities. The front of a business place in a street, or the facings in an isolated dwelling-house, are all that is required to be of this class.

Mr. Lawson estimates the difference in cost of brick over timber in an ordinary dwelling-house at from 33 to 50 per cent. Taking it at a mean of those rates, a wooden house worth £1,000 would cost £1,400 in brick, the cost of the walls being respectively £300 and £700. The interest of the amount saved is sufficient to rebuild the walls every ten years, which is oftener than required, but it is not sufficient to renew the whole house when the walls decay—a very probable contingency—for the renewal of the walls entails, practically, the entire reconstruction of the building. Besides, the interior of a wooden house is more subject to deterioration and injury than that of a brick or stone one; and the permanent charges, such as repairs, painting, and assurance, are always much higher.

Independently of the increased comfort and security obtained, I believe that even now it is true economy to build our houses with more durable materials; and when the railways are in full working order, north and south, the matter will be placed beyond doubt.

At present Oamaru stone costs 5d. per cubic foot, in blocks at the quarries, and 3s. 6d. in the same state in Dunedin. When the railway is opened it should be brought into Dunedin at 1s. 6d., the price when laid being 2s. 6d., which is a saving of 44 per cent. on current rates. The brown and grey freestones of Waihola are already within reach of railway carriage, and will be conveyed to town for about 4d. per cubic foot, so that they can be sold for 1s. 6d. As already stated, the former is too hard for fine work, but the latter is an admirable substitute for the Oamaru stone; it is a compact limestone of the proper consistency—soft enough to be easily worked, but sufficiently hard to stand the weather.

Roofing slates appear to be obtainable in New Zealand in almost inexhaustible quantities, and of even better quality than American, or our own Welsh slates, the proportion of silica being much greater.

The slate deposits on the Kauroo are of a vast extent. Professor Hutton, in a recent report on the subject says:—

"The thickness of the bed forming the present face cannot be as yet ascertained, but is no doubt considerable. The side of the valley, above the quarry, rises very abruptly, so that before long the height of the workings will be over 100ft., and wiil continue to rise to 500ft., so that a comparatively thin bed even would produce an enormous quantity of slates. In addition to this bed, there are at least two others higher up in the valley, both of which will be available for working when the fallen rubbish is cleared from the surface. Higher up the hill other outcrops of good slates are seen, so that no doubt the supply is practically inexhaustible."

Mr. Macpherson, a practical slate quarry surveyor, from Wales, bears similar testimony to the extent of the deposits, and states further that the quality of the slates and the facility for working the quarries, are superior to anything he has seen in the Old Country. In England, slates are usually obtained from comparatively thin layers surrounded and embedded in hard rock. The best vein at Bangor is only 60ft. thick. At Otepopo there seems to be a whole mountain of the material, perfectly homogeneous, and nearly all available.

The value of our slate deposits is very much enhanced by the fact that the product is infinitely superior to anything hitherto discovered in the other Australian colonies. I have compared the Otago slates with samples from various parts of England, America, Australia, and Tasmania, and so far as I can judge, the Blue Welsh is the only rival it has. Indeed, the resemblance between them is so great, that when similarly-grained specimens of the two kinds are placed together, the best judge can scarcely distinguish them.

It will also be seen from the following comparative analysis of American, Welsh, and Otago slates, that the little difference in chemical composition between the Welsh and Otago samples is in favour of the latter, inasmuch as it has a slight preponderance of the imperishable ingredients:—

	Welsh.	American.	Otago.
Silica	60·50	56·65	65·44
Alumina	19·70	19·33	21·04
Protoxide of iron	7·83	7·12	6·20
Lime	1·12	2·77	0·75
Magnesia	2·20	1·00	0·44
Alkalies	5·38	8·30	4·49
Water	3.30	5·15	3·75
	100·03	100·32	102·11

Timber, too, is found in different varieties, and in great profusion.

Otago possesses about 2,250,000 acres, or 3,500 square miles of forest lands, With the exception of a block of 600 square miles in the north, which is almost treeless, the forests are well disperssd throughout the province, and the largest supplies are in very accessible situations. Practically there is a belt of forest along nine-tenths of the Otago coast. It is quite unbroken from the north-west boundary at Martin's Bay to Riverton, a distance of 200 miles, and the gaps from thence to Waikouaiti, near the north-east boundary, are few and short. The West Coast belt extends with greater or less continuity right across the country to Waiau valley, its resources being comparatively unknown. The timber on the seaboard is good, but that in the interior is supposed to be scrubby. There is a considerable quantity of birch in the seaboard forest from Martin's Bay to Preservation Inlet, but round the south and east coasts they consist of pines and other common varieties. Stewart Island is one large pine forest, with a fair sprinkling of rata. Southland is remarkably well supplied with timber. A glance at the map shows an alternation of bush and open country that resembles the conception of a landscape gardener more than a natural arrangement. These isolated patches of forest embrace the whole width of the country, and extend 50 miles inland. One of the largest bushes in the interior of the province extends along the face of the Eyre mountains from the Five rivers to the Te Anau lake, including the Mararoa district. It covers about 400 square miles. This and the Lake forests, altogether about 400,000 acres, are all birch.

The principal forests now available near the sea-in Southland, are from Riverton to the Waiau, sixd teen miles long by twelve broad; and the Seawary bush, from Invercargill to the Mautura, twente miles long, and from two to three broad. The Ototara, Waikiwi, and Makarewa bushes in th- vicinity of Invercargill are also of considerable ext tent. Following up the coast the next large fores, is the Tautuku bush, extending from Waipapa point to the Cluto river, a distance of forty-five miles, and inland about twelve. We have then smaller patches at Kaitangata, Akatore. Dunedin, Waikouaiti, and Otepopo. The principal isolated bushes in the interior occur at Waipori, Tapanui, and Switzers. Except on the west coast, where it descends to sea-level, birch does not exist in forests below an altitude of 900ft.

The quality of many of the woods is good, as will be seen by an extract with which we conclude our notice of Mr. Blair's really valuable book in which he gives the result of some experiments made with upwards of 400 pieces of various kinds of timber which were tested under his direction.

They were obtained from all parts of the Colony. Generally the samples were from ordinary market stuff, picked up promiscuously in the timber yards, therefore the results can be considered a fair average of what may be expected in practice. The samples are carefully prepared and tested by Mr. Buchanan, and the results worked out and checked by other officers of the Public Works Department. So far as they go I have every confidence in the accuracy of the experiments and the deductions made from them. By referring to Balfour's Tables in the Jurors' Reports of the New Zealand Exhibition, it will be seen that there is a great difference between his results and mine in many of the more important timbers, the following being the most conspicuous examples:—

Name of Timber.	Balfour.		Blair.	
	No. of Pieces Tested.	Breaking weight. Pounds.	No. of Pieces Tested.	Breaking weight. Pounds.
Silver Birch ...	8	158·20	11	175·50
Red Pine	16	140·20	25	175·44
White Pine ...	11	106·00	4	166·62
Red Birch	7	202·50	99	156·84
Totara	17	133·60	10	142·50
Kauri	12	165·50	34	137·17

BOOKS RECEIVED.

In *A Short Memoir of the Late Eminent Shropshire Genealogist and Antiquary, William Hardwicke, Esq.* (Madeley, Salop: J. Randall), Mr. Hubert Smith, F.R.H.S., tells us that Mr. Hardwicke, who was born at Allscote, in 1772, was a solicitor at Bridgnorth, who cultivated a taste for genealogical and historic research, possibly because of his appointment as a local registrar of wills. He collected great stores of MSS., but seems to have declined to publish his information except in occasional magazine articles, from a shrewd suspicion that archæology does not pay. That he returned to Wales in his later years, and died at Barmouth in 1843, may be facts interesting to his family; but, as he did so little for posterity, posterity will feel little interest in so prudent an investigator of county records. The *brochure* is well got up, and illustrated with an engraved portrait by Whymper, and with photographs of the Ouseley's mansions at Allscote and Worfield, the latter a charming Queen Anne mullioned and brick structure, and of Llanaber Church, Barmouth.——*A Treatise on Metalliferous Minerals and Mining*, by D. C. Davies, F.G.S. (London: Lockwood and Co.) is the work of the author of "A Treatise on Slate and Slate Quarrying," which we had occasion to speak very favourably of in these columns some time back. The book before us seems characterised throughout by the same desire to impart accurate information, and the same facility for doing it—two things not so frequently found together in text-books of the mechanical arts as is desirable. The book is copiously illustrated and well printed.——*The Artizan's Year-Book and Engineer and Building Trades Almanac for* 1880 (London and Manchester: A. Heywood and Son) is a well-selected compendium of useful information, likely to be of daily service to everybody in any way connected with construction or machinery. The matter has been gathered from reliable sources, and the compilers should receive sufficient encouragement to repeat their efforts in 1881.——*The Great Industries of Great Britain* (London: Cassell, Petter, and Galpin) is another volume of this admirable serial.——*Tables of Metric Measures and their English Equivalents*, by G. M. Borns (Charles Gilbert, 37, Bedford-street, W.C.), will save many an architect and engineer valuable time in reducing metric measures into English equivalents.——*The Life and Work of St. Paul*, by Canon Farrar (London: Cassell, Petter, and Galpin), is a work which cannot, for obvious reasons, receive in these columns the notice it deserves. We may, however, say that however the reader may differ from, or agree with, some of the conclusions arrived at by the author, there can be but one opinion as to the powerful influence for good on the minds of ordinary people, who have neither the time nor inclination to follow more abstruse commentators, which the learned Canon's vigorous and popular method of treating his subject is likely to have. One seems to realise when reading the book that the great Apostle and his colleagues were indeed men of "like passions" with their fellow-men, yet distinguished from them by the enthusiasm and heroism which characterised their life-long conflict on behalf of Christianity. Too much praise can hardly be given to the way in which the publishers have produced the volumes.

SCHOOLS OF ART.

Maidstone.—The distribution of prizes to the successful students of the Maidstone School of Art took place on Friday evening. The report stated that the committee were glad to be able to announce a large attendance of students during the year ending August, 1879. The number of drawings executed was larger than usual, comprising 567 sheets and seven oil-paintings. The class keeps a good position amongst other schools in England, standing third in the list of prizeholders. The committee continued to regret so few, comparatively, presenting themselves at the annual examination, and said it would be desirable to see more of the students candidates for examination in the second grade. The balance-sheet showed that the receipts had amounted to £164 0s. 7d., and, after paying all expenses, there was a balance in hand of £10 7s. 8d. The Rev. H. Collis, vicar of St. Philip's, afterwards read a paper on "The Study of Art considered in its aspect of a training in mental discipline."

CHIPS.

An important extension of the Metropolitan Railway will be opened for traffic on Monday next. At its commencement it forms a continuation of the recent extension of the St. John's Wood line to West Hampstead station, and it terminates at Willesden; there is an intermediate station on the Edgware-road for the accommodation of Kilburn and Brondesbury. The works have been carried out by Mr. Firbank, from the plans of Mr. Charles Liddell, the consulting engineer to the Metropolitan Railway Company. The further extension of the railway from Willesden to Harrow is in a forward state, and is expected to be ready for opening within four months' time.

Darmsden Church, Suffolk, is about to be pulled down and rebuilt on the old foundation, from designs by Mr. H. Green, architect, Norwich.

The work of boring for water for the East Dereham local board was commenced on Monday week by Messrs. Villiers, of Beverley. The site selected is on the Cemetery road, a quarter of a mile from the centre of the town, and 40ft. above the level of the centre of the town. The work is carried on under the superintendence of Mr. Nankivell, surveyor to the local board.

A chapel is in course of erection from the designs of Mr. Charles Bell, at the corner of Christ Church and Roupell roads, Roupell Park, Streatham.

The Dublin town council took into consideration on Monday week an official representation from the consulting sanitary officer as to the whole of Plunkett-street, and Blackhall-row, and parts of many courts and lanes adjoining, which he regarded as an "unhealthy area." It was decided, after discussion, to deal with this area under the Artisans' Dwellings Improvement Act of 1875.

The new premises of the City Carlton Club in St. Swithin's-lane, King William-street, were opened on Wednesday week. The internal fittings have been supplied by Messrs. Jackson and Graham, of Oxford-street. The total cost of erection has been £27,000.

A new organ case is being erected in St. Peter's Church, Folkestone, by Mr. Harry Hems, of Exeter, from the designs of Messrs. Morris and Stallwood, architects, of Friar-street, Reading. The case is composed wholly of well-seasoned wainscot oak, and is Early English in style. The height of the case is 16ft., and the west frontage is 8ft. wide, whilst its northern façade measures about a foot less in width. A portion of the front immediately above the key-board coves over, and then opens with tryptical shutters. These are enriched by paintings upon oak panels. When closed, the whole presents one picture illustrative of the life of St. Martin.

Building Intelligence.

Barcombe.—The parish church of Barcombe was reopened on Saturday after restoration, at a cost of £2,800, from the designs of Mr. C. L. Luck, of Carlton Chambers, Regent-street, the work being entrusted to Messrs. Card and Son, of Lewes, under the superintendence of Mr. G. Johnson, their foreman. The alterations in the ground-plan are, that the south aisle has been widened and a new porch and vestry have been constructed. The chancel has been entirely rebuilt, and so, of course, have the walls of the aisle; the north wall has been refaced outside and in, the old arcade has been restored to the perpendicular, its facing stones recut, and a new arch added at the chancel end. The seating throughout is entirely new, of yellow deal stained and varnished, and will accommodate 300 persons; the pavement is of Minton's tiles. The roofing of the chancel and nave is of stained wood, ribbed and panelled; the aisle has an open roof. The altar, pulpit and reading-desk are of old oak.

Bootham.—During the last half year considerable alterations and additions have been made to the Society of Friends' Boys' School, Bootham, York, including a new gymnasium, laboratory, fives' court, workshop, and additional class rooms. The gymnasium is the gift of the old scholars, who subscribed the necessary sum of money required for its erection in January last, as a memorial of the 50th anniversary of the foundation of the school; its length is 43ft. by 20ft. in width; the roof is an open timbered one, and is glazed in between the principals, which are of ornamental construction. The fives' court which adjoins the end of the gymnasium, is 40ft. long by 25ft. in width, and is paved with Portland cement concrete. The chemical laboratory is now being fitted up with stands for 16 students, draught chambers, and cupboarding, &c., for apparatus, the arrangements being of similar character although on a smaller scale to those adopted at Owens College, Manchester, and Elmfield College, near York. The gymnasium, workshop, and play-room are warmed by means of Messrs. Shillito and Shorland's patent stoves and warm air flues. The whole of the works have been carried out by Mr. John H. Thorp, contractor, of 20, Bowman-lane, Leeds; Mr. William H. Thorp, St. Andrew's-chambers, Park-row, Leeds, architect.

Canterbury Cathedral.—After being closed for about two months for the purpose of being re-pewed, the choir of Canterbury cathedral was reopened on Tuesday. In 1876, the Dean and Chapter determined that the new work should assimilate in style to the screen constructed by Prior Henry de Estria in 1304. These beautiful open screens of stone were raised upon the walls and continued across the west end of the choir, no canopies of any sort being used, except above the two principal seats on either side of the western entrance. These were of stone, and formed a part of the general design. This western portion of De Estria's work has been concealed since the time of Archbishop Sheldon by elaborate canopy work of the Caroline period. The authorities engaged the services of the late Sir Gilbert Scott to act in conjunction with their architect in devising plans for re-pewing the choir in accordance with the style referred to, and for other proposed works. Ultimately the plans thus submitted were adopted, and ordered to be carried into execution under the direction of Mr. J. O. Scott, son of the designer. The carving was forthwith intrusted to Messrs. Brindley and Farmer, of Westminster Bridge-road, London. The cost of the re-pewing, exclusive of alterations to gas-fittings, hot-water apparatus, new flooring, &c., amounts to £6,000, and the whole expense will probably fall little short of £10,000.

Higher Openshaw.—On Saturday afternoon the foundation stone of St. Clement's Church, Higher Openshaw, was laid. The plan of the church is oblong; the only projections will be the chancel and two porches. The style is that of the Geometrical Period of English Gothic. The aisles are lighted by sixteen side windows and two at the west end. Quasi-transepts are formed by gabling the two easternmost bays of aisles, and a large three-light window is placed high in each gable. East of the transepts are situated on the north, the clergy vestry, &c., and on the south the organ chamber. Between the organ and vestry is a lofty chancel, 22ft. in width. Eastwardly the chancel ends in an octagonal apse, the three bays of which contain each a two-light window with traceried heads. Internally the dimensions of the church are as follows:—Extreme length, 117ft. by a width of 50ft.; the nave from floor to ridge will be nearly 50ft.; and the chancel 46ft. The walls internally will be plastered between stonework, and open-timbered roofs have been adopted. Durnford parpoints will be used throughout the exterior, with Yorkshire dressings to all windows and angles. Accommodation will be provided for 664 adult worshippers. The contractors for the superstructure are Messrs. Wilson, Toft and Huntley, Messrs. Cordingly and Stopford doing the masons' work. The whole of the works is executed from designs prepared by Messrs. Enticknap and Walter K. Booth, architects and surveyors, of Kennedy-street, Manchester. The estimated cost of the works under the present contract, exclusive of the tower, is about £5,300.

Lancaster.—The new Centenary Congregational Chapel was opened on the 13th inst. The church is designed in the Romanesque style and is built of stone. A tower and spire at the south-west angle give character to the building. Internally the first consideration was to effectually light the building, a matter of some difficulty in a galleried building with light obtainable from only two sides. This problem has been satisfactorily solved, and the building is certainly not deficient in the way of affording space for daylight to enter. The roof is lofty and waggon-headed in form; all timbers throughout are pitch pine simply varnished. The warming is by hot water, and the ventilation on the "Tobin" system, opening casements and by an extracting shaft in the roof. Mr. Dixon acted as clerk of the works. The building has cost upwards of £4,000, exclusive of site, and has been carried out from the designs of the architects, Messrs. Hetherington and Oliver, of Carlisle.

Liverpool.—The new Hanover Galleries at Liverpool have been completed. The irregular rooms and galleries in rear of the front offices have been demolished, and in lieu of them has been erected a handsome pile of buildings, which not only covers the area of the original premises, but extends over the whole quadrangle, which was formerly an open yard or garden. On the ground floor, the principal saleroom is approached through the old building, and consists of one large room occupying nearly the whole area of the new building. It is 66ft. long by 47ft. 6in. wide. On the first floor is another saleroom 47ft. long by 31ft. wide, with an open roof, the ceiled portion of which is about 25ft. from the floor. Out of this saleroom leads three large picture-galleries *en suite* with the first floor saleroom. All these rooms are lighted with top lights for the better display of paintings. Care has been bestowed upon the lighting and ventilation of the various rooms and lavatories. The whole of the works have been carried out by Messrs. William Tomkinson and Sons, of Dansic-street, Liverpool. Mr. Edmund Kirby, of Liverpool, is the architect.

Metropolitan Board of Works.—At this Board on Friday contracts were sealed with Messrs. T. and R. Bamlett for painting, &c., Vauxhall-bridge, and with Messrs. J. Mowlem and Co. for similar work to Lambeth Suspension Bridge. It was decided to take no further steps towards the removal of the private bars in the streets of the metropolis or towards the formation of a park in the neighbourhood of Kilburn and West Paddington. The Wandsworth district had applied for the recoupment of the costs incurred in disinfecting the basements of houses which are subject to floodings from the sewers, but the Board considered they were not liable.

Nuneaton.—The new grammar-school at Nuneaton is almost finished. The design was prepared by Mr. Clapton Crabbe Rolfe, of Reading. The contract was taken for £3,500, by Mr. Thomas Smith, builder, of Coton-road, Nuneaton, and the works have been well pushed on under Mr. Rolfe's personal superintendence. Red bricks are used generally, interspersed here and there with courses of Bath stone; a deep moulded plinth, which runs along the basement, is dark blue brickwork. The dressings are all of Bath stone, and the various label stops are carved. The roofs are of very steep pitch, covered in by red tiles. The schoolroom is a large one-storied room, lit on either side by four four-light windows having teak casements. At one end is a mantlepiece, carved in English oak. The master's house, and the various offices, group in well with the school. They are a trifle more domesticated in character, and marked by the introduction of half-timbered work in oak. Standing upon a moulded stone corbel, and protected by a canopy, at the junction of the school and master's house, is a statue, nearly life-size, of the founder, King Edward VI. It is in Ketton stone, and is the handiwork of Mr. Harry Hems, sculptor, of Exeter, who has also executed all the ornamental carving and lettering in stone and wood upon the building.

Strabane.—Christ Church, Strabane, Ireland, was consecrated on the 30th ult. The foundation-stone had been laid in November, 1874. The original contract was signed for £4,000; but owing to alterations and additions, such as the use of polished Peterhead granite in interior columns and extra cut-stone work, the cost approaches £5,000. Messrs. Ballantine, of Edinburgh, have supplied a traceried five-light east window—subject, "The Last Supper,"—modelled on Leonardo-da-Vinci's picture, and Mr. Gibbs, Bloomsbury, London, two single lights. The chancel has been somewhat richly decorated. The tower contains a good-toned bell, weighing 23cwt., by Murphy, Dublin. Mr. John Kennedy, M.R.I.A.I., Londonderry, is the architect, and Mr. James McClay, of Strabane, builder. (This church was illustrated and described in the Building News of September 25th and October 2nd, 1874.)

Swansea.—The first of a few proposed Cabmen's Shelters has been placed near the Harbour Offices, Swansea. It is 13ft. 6in. long and 7ft. 6in. wide, with octagonal ends, and accommodates twelve men. The material used in its construction is pitch-pine and varnished; it is strongly made and put together with the necessary ironwork and made movable by wheels attached. The roof has two framed and curved principals and is open timbered, on which is laid match boarding and sheathing felt and covered with Raby's rolled patent zinc. The interior is fitted up with twelve lockers with seats and sloping backs, lavatory basin and marble top with the usual wood-framing, &c., under; a table with receptacle for coals under, and a stove with iron pipe leading through the roof, and is well-ventilated. The sashes are glazed with figured enamelled at bottom and clear glass at top. It was erected by Mr. David Morgans, builder, of Swansea, in about sixteen days, from the design and under the superintendence of Mr. Geo. Harman, architect, Swansea.

Trevarno.—A new chapel was opened on Wednesday week near Trevarno. The style is Early English. The building is 62ft. long by 40ft. wide. Provision is made for the erecting of a school-room in the rear, the plans for which embrace a clock-tower 60ft. high, and a school will be built in the spring. The walls are constructed of dressed elvan stone, with granite for the plinths, quoins, &c., and Bath stone for the more ornamental parts. The cost was nearly £2,000, which will be increased to £3,000 when the school is built. The architect is Mr. Hicks, of Redruth; the contractor, Mr. Wm. Broad, of Porthleven. The chapel is warmed by Trusswell's patent warming apparatus.

CHIPS.

A shrine of the Sacred Heart has been erected in the north transept of St. Marie's R.C. Church, Sheffield. The design consists of a pedestal of polished marble and alabaster, delicately carved, with a marble offering-table supported on marble pillars, which were formerly, it is said, the altars of Durham Cathedral. This sustains a carved reredos of oak, gilded and painted, placed behind a figure of the Sacred Heart. On panels at either side are figures of Saints, and below are, SS. Margaret and Mary, and St. Jane Frances de Chantal. The paintings are by Mrs. Westlake. A memorial window of two lights, representing the Annunciation, has been placed on the staircase to the new oratory, and before it is a picture of St. Winnefrede.

A Catholic club was opened in Hatton Garden last week. The contractors have been Messrs. Madden and Collins.

In order to afford employment to the poor during the winter, the Rural Sanitary Authority of Longford Union propose to expend £9,000 on widening and deepening the river Camlin, a tributary of the Shannon.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J, Passmore Edwards.

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Cases for binding the half-yearly volumes, 2s. each.

Errata.—In the description of Mr. Waite's design for a "Dairy Homestead" published last week, stalls for cows should read "7ft." in width, and not "7′ 6" This may appear a small matter, but is of importance in long ranges. See 23rd line from top, also in 67th line from top, for "stockyard" read "stackyard," two very different places.

Received.—S. Bros.—J. K. J.—T. P.—W. and B. S.—H. B. of W.—C. H. and Co.—H. and K.—A. S. B.—C. Bros.

Civis. (Your query is an advertisement.)—Draughtsman. (We hesitate to give an opinion. If it was a private speculation, of course you would be prohibited, but we should hardly think the Government would interfere. On the other hand, it is possible the exclusive right may have been granted to the publisher, and in that case of course he would stop you.)

"BUILDING NEWS" DESIGNING CLUB.

Pendennis. (Yours was intended to be placed in the list of class 3.)—Tottie. (Yes, your suggestion would entail an increase to our staff.)—Burswell. (You may add a room or two so long as you do not exceed the limits of space. The letter R was simply a private mark for roller.)—Minor. (You can alter your motto as desired, it would then avoid risk of confusion.)

Drawings Received.—Tuce, Heart and Arrow, Ogmore, Mediocria Firma.

Correspondence.

CARDIFF FREE LIBRARY, MUSEUM, AND SCHOOL OF ART COMPETITION.

Sir,—This competition promises, I fear, to share the fate of many previous enterprises. The original instructions to architects—which are exceedingly vague, not to say unsatisfactory, on several points—have now been supplemented by some lengthy "Replies to Queries," which show how loosely the instructions were drawn up.

There is one reply, however, which I wish to bring before the notice of intending competitors, viz., "No. 13.—No architect will be called in to advise in the selection of the designs." I learn on good authority that a special committee, consisting of members of the Corporation only, are appointed to make the selection; and as this committee issued the original instructions, it does not require much observation to judge of their competency for such a duty. I am also informed that several architect members of the Free Library and Science and Art Schools Committee of Management are competitors, so that this will, or should, preclude those who have the advantage of knowing the particular requirements from having a voice in the decision.

I understand that over 500 applications for particulars have been made, and as the subject has apparently attracted the notice of so many, I think it desirable to lay before them the information which has led me to adopt the position of a Non-Competitor.

London, 18th November.

ST. ALBAN'S ABBEY.

Sir,—I have read Mr. White's long letter reiterating what he had said about the destruction of a Norman corbel-table. I emphatically deny that such a corbel-table existed. Mr. White acknowledges that his examination was a superficial one, and is kind enough to impute motives for the removal of this so-called corbel-table, alleging that it was done to obliterate all traces of the Norman roof. He also points to his examination of the marks of the original roof; but when I state that that roof was 284ft. long, that the duration of his examination was twenty minutes only, and was made in a torrent of rain, with an umbrella over his head all the time, the value of such a minute survey will become apparent to everyone.

Mr. White's letter bears evidence of his having been anNeale-d; let us hope it will result only in eccentricity.

It is a pity that Mr. White's idea of conservatism for churches was not of an earlier date. I have a photograph of a nondescript reredos, inserted, by cutting away the ancient work, in the east wall of Boxgrove Church, Sussex, some years ago by Mr. White, which, after disgracing the Early English window above it for about seven years, was removed for the erection of a reredos of beautiful design, and the abortion deposited on the rubbish-heap.

One word while I am writing, and this does *not* apply to Mr. White. The triforia and clerestories of the abbey, now under repair, as well as some deep hollows of mouldings, have been much used by a certain student or measurer for the deposit of a host of medicine bottles, a collection of which is in the custody of the foreman, and who will, on application, gladly give them up to the owner.—I am, &c.,

St. Alban's, Nov. 18. John Chapple.

GOVERNMENT CLERKS OF THE WORKS, &c., AND PRIVATE PRACTICE.

Sir,—May I inquire through your columns if it is usual for the draughtsmen and clerks of works in the Government employ to be allowed to carry on private practice as architects and surveyors?

I ask the question, as in one place I am acquainted with, not a hundred miles from St. Paul's, several works, public and private, are now being carried out by gentlemen in the above position, who, from the nature of their appointments, are restricted, I believe, from carrying out private works on their own account. Yet they openly advertise tenders for their work, and no notice is taken of it by the heads of their several departments. Surely this is not fair to the private practitioner or the public, who pay to maintain their offices, and very often sinecure appointments. Either the public service or their private clients must suffer under such an arrangement. An answer from some of your well-informed correspondents on the subject will oblige— A Puzzled One.

"FROM THE BANKS OF THE CLYDE."

Sir,—I have read with some interest the communication "From the Banks of the Clyde," by "J. H. T.," in your issue of the 14th instant. Critical articles, however, do not generally please everyone, and your contributor will, I dare say, not be surprised if exception, by some readers, be taken to his. I am not going to question the soundness of the judgment that he passes upon the several buildings which he mentions, although I am not altogether alone in holding somewhat opposite opinions with respect to some of them. I shall deal rather with one or two generalities.

I extract the following:—"Of the Palladian or Classical Italian we have even but too much in Glasgow, its predominance here being attributable, in a great measure, to the long and influential life of the late Mr. Hamilton, a prominent champion of the Classical, and especially the Greek style, whose letters to the Earl of Aberdeen are probably known to some of your readers." The principal works of the late Mr. Hamilton, of Glasgow, are mentioned in the Architectural Publication Society's Dictionary, and I am not aware that even one of them is "Greek"; and I certainly am not among those "of your readers" to whom "are probably known" his letters to "the travelled Thane, Athenian Aberdeen." Neither can I see how that the predominance of the Palladian or Classical Italian can be attributable in a great measure to a championship, however prominent, of especially Greek. Mr. Hamilton designed in Roman, Italian, Gothic, Elizabethan, and Jacobean: Greek is the very style in which he did not design. Alexander Thomson was the prominent champion of especially Greek, although before his time excellent Greek work had been done by Stark, an architect of high creative genius and culture, in the jail; and by Clarke and Bell in their grand composition the old Merchants' House and county buildings. That which I think Glasgow has greatly to regret, is that more of its younger architects are not influenced by such works as those of Hamilton, Stark, Clarke and Bell, and Thomson. There was, however, a Mr. Hamilton, in Edinburgh, an architect in Greek of the very foremost rank; and it need scarcely be said that none of the Palladian or Classical Italian in Glasgow is attributable in any measure to the example or precept of the great artist-architect of the Edinburgh High School.

"J. H. T." says in his article that it is announced that the designing of the Glasgow municipal offices will be thrown open to public competition. He may have, perhaps, peculiar facilities for ascertaining; but I know that no such announcement has been made *officially*. Upon the designing of these intended buildings he remarks:—"It would seem that neither the Gothic nor the Scottish Baronial style would be very appropriate in a square already occupied by Classical buildings; but the Jacobean or Renaissance may be chosen without causing too violent a contrast, and it cannot be disputed that this style, when successfully treated, offers sufficient scope for variety of outline and ornament in detail, to gratify lovers of the picturesque in architecture." What is wanted in Municipal Offices for a great city such as Glasgow, is a building dignified in its general effect and pure in feeling, and I do not well see how this can be designed in either Jacobean or Renaissance. George-square is not a site for "the picturesque." There is enough of the disturbing element in it already, and what is now wanted is neither "variety of outline" nor "ornament in detail," but Classical repose, a repose taught by even "the stiff, meagre, and pedantic (?) fabrics raised by the school of Adams and Chambers." The opportunity is a great one; the purpose is important, the site is good, and it is to be hoped that there will not be wanting either liberal consideration by the city, or invention guided by judgment in the architect.—I am, &c.,

Glasgow, November 19th. Caius.

KNIGHTSBRIDGE BARRACKS.

Sir,—The short notice of the new barracks at Knightsbridge, in your issue of last week, has been a source of much amusement to many of your readers. The London correspondent of the *Leeds Mercury*, starting with the preconceived idea that the architectural merits of the building were due to the employment of a military architect, pithily describes the design of an eminent civil architect, and a President of the R.I.B.A., as a "tasteless muddle of red bricks and white stone, which do not even suggest its use and purpose." It would be interesting to know what criticism he would have written for the *Leeds Mercury* in 1877, had he noticed the elevations on the walls of the Royal Academy.

With regard to light, air, and sanitary arrangements, which he fears have been overlooked, he will be glad to know that the regulations laid down by the Barrack and Hospital Improvement Commission, to whose researches and suggestions the architectural profession owe so much, have been strictly followed with many improvements which experience and a careful study of sanitary science have rendered advisable. If the correspondent of the *Leeds Mercury* were to obtain permission to go over the building, he might possibly combine the profits of instruction with the pleasures of criticism.—I am, &c., P. D. A.

YORK STAIRS WATER-GATE.

Sir,—After reading your remarks of last week accompanying the very able drawing of Mr. Gibson, and your brief allusion to the probable "restoration" of York Stairs Water-gate, the thought is naturally responded to by one who knows this old relic when viewed from before or from behind. Why should it be, either taken down and rebuilt, or "raised up bodily"? Why not, as you suggest, leave it as it is, but lower the contiguous ground in the garden to form a pool, and complete the steps down to the water? A gravel path flanked by grassy slopes might dip down into the hollow to near the level of the water. The arrangement, just completed, of the path and slopes down to the interesting remains of the chapter house and cloister of old St. Paul's are a very tasteful example of such a treatment. A service-pipe might be laid to the Thames and the water changed at intervals, for usually at high water the river is now sweet and pleasantly clear; and we may trust that it will be still more so when the diversion of the sewage is more complete. A small pipe would suffice, which, should the District Railway be an obstacle in its way, might possibly be carried along the crown inside an existing outlet of an old sewer, and so pass the railway. It is sometimes safer to take the water to an old horse than to take an old horse to the water.—I am, &c., Aqua et Præterea Nihil.

19th November.

Sir,—If this old water-gate, which you illustrated last week, is in any way moved, even merely raised, it will, in my opinion, lose a great deal of its interest. It is almost the only thing left now to show us where the river once was. For these reasons I hope the Metropolitan Board of Works will do no more than clear away the earth which now covers the lower part of the building, and form an area round with the ground sloping towards it.—I am, &c., C. F. M.

THE LATE MR. W. FARMER.

Sir,—The latter part of your article on the above gentleman in last week's issue requires correction where you say, "We understand the late Mr. Farmer has been unable for some years past to take an active part in the business, &c., &c."

Mr. Farmer, since recovery from a severe illness two years ago, has been most energetic in business even to within a few days of his death, when he was taken off most suddenly by bronchitis.—I am, &c., W. Brindley.

67, Westminster-bridge-road, Nov. 17.

Sir,—Adverting to your notice of the important works executed by the firm of which my lamented father was the head, I think it right to correct the statement with which it concludes by mentioning that up to the very day of his death he devoted all his personal energies and all his singular resources to the superintendence of those important works; indeed, I may truly say of him that he died, as he lived, "in harness."

Requesting this correction in your next number,—I am, &c., W. J. Farmer.

67, Westminster-bridge-road, Nov. 18.

CHIPS.

The Commune of Oberammergau has built a new theatre for the representation of "The History of the Sufferings and Death of Jesus," which will be given in the famous valley next year. The part for the spectators, which will accommodate between five and six thousand persons, is built in the form of an amphitheatre. There are 100 rows of seats, each row to contain 60 persons. The new building has cost the Commune up to the present 40,000 marks (£2,000).

Dauntsey Church, Wilts, has been repaired, at a cost of about £400, under the direction of Mr. A. J. Style, A.R.I.B.A., of Westminster Chambers. Mr. Mnllings, of Devizes, was the contractor; and the fittings were supplied by Mr. Singer, of Frome, and Messrs. Jones and Willis, of London.

Buildings are about to be erected for the City of London Associated Guilds, with frontages to Princes-square, Lambeth, and Kennington Park-road, for use as a technical art school. Messrs. Waring and Nicholson are the architects.

St. Leonard's Church, Edinburgh, which was only opened seven months ago, and was erected at a cost of between £7,000 and £8,000, was destroyed by fire on Sunday last. The fire is supposed to have originated through the overheating of a stove.

Intercommunication.

QUESTIONS.

[5946.]—**Rain Water and Domestic Water Supply.**—There is either some error in the table relating to tanks, in the Building News of Nov. 7, or further explanation is required. A tank 5' 9 dia., and 7ft. deep, is shown to cost £7 10s., and one 4' 6 dia., and 7ft. deep, £11 5s. What is the meaning of the dimensions braced together both being alike?—Puzzled.

[5947.]—**Illicit Commissions.**—Have any of your readers got a copy of the "Minutes of Evidence" and the "Report of the Special Enquiry" recently made by a committee of the Court of Common Council into the charges of bribery brought against certain officers of the Corporation? I have just been perusing them, and the revelations they contain are certainly astonishing. Can any reader tell me if the conduct of certain professional men, as set forth in these reports, cannot be checked? Has the Institute of Surveyors or the R.I.B.A. nothing to say? If not, how is a young struggling professional man, anxious to keep his hands clean, to expect to get business when great firms, out of "pure generosity and kindness," retain in their interests those whose influence is paramount?—Kappa.

[5948.]—**Dilapidations.**—Will some surveyor kindly give me his opinion on the following case? In a well built house, built 90 years ago, the parapet wall has bulged inwards, but is still perfectly firm and secure. It has the appearance of being a shrinkage of the bricks that occurred many years ago. The lessor's assignee having just bought the reversion of freehold (there are 9 years of lease to run) serves a notice on lessee to pull down and rebuild the parapet, the same being perfectly sound. Can lessor enforce rebuilding of same! — Lessee's Surveyor.

[5949.]—**Estimating Cost of Buildings.**—Will any of your readers kindly give me some information on estimating the cost of buildings by cubing? I know it is usual with many architects to estimate value of buildings by this method, but I find prices vary from 4d. to 9d. and 1s. per cubic foot, and I am in want of a more definite price for first estimate for churches, municipal and other public buildings. Where can I obtain this, and can it be relied upon with any degree of certainty? I have read the article in the Building News of last week, but consider that it is a too tedious operation to "take out quantities" for preparing the estimates usually required to accompany competition drawings for large buildings; nor is it often practicable to compare with similar existing buildings.—Young Architect.

[5950.]—**Stable Floors.**—Will any of your practical readers oblige me by giving their experience of the flooring of stalls of stables? What is the best material for the purpose? Are small Buckley bricks laid on edge liable to be chipped by the horse's hoofs? Is cement better, and if so, should it be grooved in any particular direction? Alpha.

[5951.]—**Parallel Motion of Beam Engine.**—Would any correspondent kindly send a simple method for setting out the parallel motion of a beam engine—say, beam 20ft., and fore links 2ft. 10½in.?—J. A.

[5952.]—**Piles.**—Having a large number of piles to draw out of a tidal dock, about 15 to 20ft. deep, what is the simplest and cheapest method to get them out?—Tyneside.

[5953.]—**Map Colouring.**—I recollect observing in the *Scotsman* some time last summer, mention of the discovery of the principle determining the best number of colours requisite for colouring the divisions of a map. This discovery was said to have simplified considerably the process of preparing a map. Where can a description of it be found?—John Williamson.

[5954.]—**Clay Grinding and Brickmaking Machinery.**—Will someone oblige by giving advice as to the best kind of machine for grinding about 70 tons of clay and shale per day? Also, the best machine for making plastic and semi-dry bricks, say, 10,000 per day.—M. R.

[5955.]—**Terminating Building Society.**—Are there any who have been members of a Starr-Bowkett Building Society that has successfully run its career by reason of *all* the shareholders having obtained appropriations? I frequently see shares advertised for sale, but while disposed to treat for some, would first like to know whether these societies really give what they are said to do by their promoters—an appropriation to every shareholder. If any of these societies have come to grief, what was the cause, or causes, of failure?—Norfolk Dumpling.

REPLIES.

[5929.]—**Ventilation.**—If "C. F. M." will refer to Mr. Thwaite's system, Fig. 1, he will see that similar provision to that for ventilating and warming day-rooms is provided for bedrooms, as I understand ventilation, if the air is diluted so as to keep the percentage of carbonic acid within Dr. Parkes' limit of 0·06 per cent., it is hygienically satisfactory. Many sanitarians object to fixing outlet ventilators in smoke flue. The reason is obvious.—J. L. Brookes.

[5934.]—**Testing Portland Cement.**—In my reply last week the sentence commencing, on the 8th line, "about 80 per cent. of cement to 15 per cent. of water," should be, "80 ounces of cement to 15 ounces of water." The word "matting," on the 15th line, should be "making."—Robert Vincent Sutton, C.E.

[5942.]—**Removing Whitewash.**—If "W. E. S." will refer to the back numbers of the Building News he will find that the question how to clean old oak work has been asked over and over again, and as often answered. "W. E. S." says the roof timbers of an old church are thickly covered with whitewash, and he wants the crust thoroughly removed. He will find that the main portion of the whitewash will readily scale off by gentle scraping, and that being done, he must get some American potash and plenty of soda and scrub off the rest. If he keeps a couple of buckets of this liquor hot and strong he will find that every vestige of the coating will come clean away, and the timbers be discovered in their entirety. But what does "W. E. S." mean when he adds he has afterwards "to stain and varnish them"? Stain and varnish the old oak principals of an ancient roof! If that sort of thing is intended, I should strongly advise him to leave the whitewash alone and stain and varnish that. When the whitewash has been got off it will be found that the oak will be a beautiful brown colour, a colour that the dignity of age alone can give it. If it really seems desirable to make this a trifle darker, let a coating of oil be given, nothing more on any account. The stain and the varnish may be saved for the next village Methodist-chapel job, where they will probably be useful. Such things are never in requisition for old oak roofs. It is, however, an open question, and one that might be discussed with advantage, as to how oak should be treated in exterior work. The shops in the Euston-road, underneath the sloped approach to St. Pancras station, are a good illustration in point. These shop fronts were made, in accordance with the late Sir G. Gilbert Scott's design, of oak, and for twelve months or so looked uncommonly well. But soon after that atmospheric influences began to tell on them, and the late Mr. William Gill, of the Polygon, N.W. ("Poor Bill Gill"! hundreds of readers who knew that genuine-hearted contractor will say, as they read this reference to a good man and true, now, alas! passed away), received instructions to paint and decorate them. Probably few folks remember now that the fronts are oak at all. Again, the appearance of the oak work used so largely in the exterior construction of Sir Henry Peek's great place down at Rousdon, near Lyme Regis, is by no manner of means all that can be desired. The best example of outside oak-timbered work I know anywhere are the beams over the gateways of the large Fire Brigade station opposite the Evelina (Children's) Hospital in Southwark-bridge-road, S.E. I had an idea that the firemen, having within their ranks so many sailors and soldiers, probably clambered up in some way and periodically rubbed with wax or oil, or some other preparation, the timbers in question. But upon inquiry I find that this was not the case, and the oak is precisely as it was left originally by the contractor. The building in question is quite a modern one. If the beams really are varnished (and from the ground they appear to be) it seems to speak well for that method of treatment for outside work.—Harry Hems.

STATUES, MEMORIALS, &c.

Glasgow.—There has just been added to the sculpture-room of the Corporation Galleries a bust in marble, by Patric Park, of the late David Hamilton, architect of the Royal Exchange, Hamilton Palace, &c. The room also contains a bust, by Mossman, of the late Alexander Thomson, the eminent architect in the Greek style.

LEGAL INTELLIGENCE.

The Metropolitan Board of Works Summoned as Owners of Unhealthy Houses.—Edward Nutfield, an agent for the Metropolitan Board of Works, as owners of several houses in Gun-street, which form part of property lying between the Blackfriars and the Borough-roads, was summoned last week to the Southwark Police-court, at the instance of the Vestry of the district, for not carrying out certain orders to render the houses fit for habitation. It was contended for the defence that the houses were not in such a bad sanitary condition as to render them dangerous to the health of the occupiers, and it was urged that if the Board, who had purchased the property under the Artisans' Dwellings Act, were to turn the occupiers out at once, whilst arbitration proceedings were going on as to the value of the premises, great loss would result to the ratepayers. The summons was adjourned for a month, the magistrate advising the Vestry to wait on the Board of Works.

The Queen v. the Institution of Civil Engineers.—This case, concluded on Saturday last in the Queen's Bench Division, raised the question whether the house of the Institute of Civil Engineers in Great George-street, Westminster, is ratable or is exempt under the Act of 1843 (6 and 7 Vic., cap 36), which exempts houses or parts of houses or buildings belonging to any society "instituted for purposes of science, literature, or the fine arts exclusively, and occupied by it for the transaction of its business and for carrying into effect its purposes, provided that it is supported, wholly or in part, by annual voluntary contributions, and does not make any dividend, gift, division, or bonus in money to or between any of its members." So long ago as 1843 the institution was certified as entitled to be exempt. In 1870, however, and thence to 1875, the valuation list included the house of the institution, valued at £874 a year, the ratable value being stated at £729, which was the value finally determined by the assessment committee. No objection was made by the institution to either of these valuations, and in 1877 the society was rated on the ratable value thus assessed. The institution appealed to the Quarter Sessions, who, however, held that the institution was a society established for the acquition of all that knowledge which may be useful to the persons practising in this country the profession of a civil engineer, and not exclusively for the promotion of scientific knowledge, and that its objects and pursuits were not such as to bring it within the statute and entitle it to exemption; and the Court accordingly confirmed the rate, subject to a case stated for the opinion of this Court.—Sir Henry James, Q.C. (with Mr. Poland and Mr. Mead), appeared and argued for the institution in support of their appeal.—Mr. F. M. White, Q.C. (with Mr. Glen) appeared and argued in support of the rate appealed against.—The argument in support of the rate was in substance this—that the institution was not for the advancement of pure science, but for the improvement of the members in applied science or mechanical art; that the use of newspapers showed that it was not even entirely for their improvement in art, but for their entertainment; and that in the benevolent society there was a division of a fund among the members. In support of the appeal it was urged that the institution was really for the advancement of science—not the less so that it was applied to practical purposes—and that, this being the main object, all the rest was merely incidental and ancillary. The Court, at the close of the arguments, took time to consider their decision.

St. Sepulchre's Church, Holborn-viaduct.—An application was made in the Consistory Court of London on Monday to settle the minutes of judgment on which a faculty would be issued to complete the restoration of St. Sepulchre's Church, Holborn-viaduct.—Dr. Phillimore appeared for the three churchwardens of the City portion of the parish; and Mr. Sutton for the two Middlesex churchwardens.—The learned Chancellor informed the parties that in the late visitation of the Bishop of London the churchwardens made a presentment to his Lordship in reference to the church. He (the Chancellor) was of opinion that as the money was provided by the inner part of the parish they should have the management, under restriction.—Mr. Sutton thought that as the faculty was to be granted to the five churchwardens the Middlesex portion should have some voice in the matter.—A discussion arose as to pews to be introduced, and the mosaic pavement was mentioned, and some objection made to the matter being heard. On the question of costs the original opinion was adhered to, that the costs of the outer churchwardens should be allowed, if there were funds out of which they could be paid.—The learned Chancellor stated the matter on which the faculty would be issued to complete the restoration of St. Sepulchre's Church.

Pavement Lights.—Hayward v. Hamilton and Another.—This was an action before Mr. Justice Hawkins and a special jury for the infringement of a patent for improvements in the construction of pavement lights. The plaintiff is the head of the well-known firm in Union-street, Borough, and the defendants carry on business in Kingsland-road. On the 31st of July, 1871, letters patent were granted to the plaintiff's brother, now deceased, for "improvements in pavement lights," which substantially consisted of a mode of introducing in glazed pavement or area light prisms of a particular shape, by means of which the light was thrown in a given direction—for instance, into a room or cellar. The plaintiff's case was that the defendants, one of whom was formerly in his employ as foreman, had infringed this patent by manufacturing pavement lights upon a similar principle. The defendants denied the novelty of the invention, and said that prisms of the kind claimed had been in common use prior to the date of the pavement by manufacturers of reflecting telescopes and engineering, optical, and mathematical instruments for the purpose of reflecting light. After hearing the evidence on both sides, which was chiefly of a scientific character, the jury answered the questions put to them in favour of the plaintiff, and found that the defendants had infringed the plaintiff's invention. The Judge entered a verdict for the plaintiff, but gave leave to the parties to bring the questions of law involved in the case before the Divisional Court.

Architects and School Boards.—On Monday at the Liskeard County Court, before Mr. M. Bere, judge, and a jury, the Lansallas and Talland United District School Board brought an action against Sylvanus Trevail, architect, Tywardreath, to recover the sum £30 9s. 7d., money alleged to have been had and received by him for the use of the plaintiffs. Mr. B. Childs appeared for the plaintiffs, and Mr. Collins, of Bodmin, for the defendant.—Mr. Childs, in opening the proceedings, said his clients felt themselves in some measure to be the trustees of public money, and, therefore, bound to bring the matter before the Court. They had occasion to build some schools, and engaged the defendant as architect, and he gave some idea of what the probable cost would be. It was agreed that he should be remunerated at the rate of 5 per cent. upon the building outlay, and be allowed all reasonable travelling expenses. This was ratified in the presence of the whole Board, and Mr. Trevail drew up the plans and specifications for the new buildings, the probable cost of which he told the Board would be £1,400 or £1,500. Invitations for tenders were issued, but the amounts were so much in excess of the sum mentioned by Mr. Trevail that the Board was astonished, and said it was impossible for them to erect such a costly building. They thereupon asked Mr. Trevail to reduce the plans so as to diminish the cost of the building. This was done, and the ultimate cost of the building was £1,785, of which the Board argued the defendent was only entitled to 5 per cent. and his reasonable travelling expenses. His clients had from time to time paid Mr. Trevail sums of money on account, and altogether he had had £30 in excess of his proper remuneration of 5 per cent. His clients had pointed out to Mr. Trevail that they had paid this money in error, and asked him to refund it. This he had declined to do, and had put in a counter claim for professional services, arguing that the amount he had obtained was only fair and proper remuneration.—Mr. Collins, in defence, urged in the first place that the agreement in the minute not being sealed with the corporate seal of the School Board, was not valid; and that money paid with a full knowledge of all the circumstances in the case could not be recovered, and quoted cases in support of this view.—His Honour: The first point is a very strong one, but I don't like to shut up the case upon that.—Sylvanus Trevail, architect, stated he arrived at his first estimate of £2,250 as being a proper outlay on the first set of plans. He charged them at that price, and gave the Board the benefit of the alterations for a less costly building, for which he had to make fresh plans, the expense of which would be about 25 or 30 guineas. He attended the meeting of the Board especially to consider the subject of the furniture of the schools. He ordered it, and had been accustomed in other schools to receive commission on such orders. He made a charge of two guineas for the measurement of some extra work not in the plans. On two occasions he went to Polperro by way of Lostwithiel because he would not risk his instruments across the ferry. He had made thirty-one journeys altogether to Polperro.—Cross-examined: No minute was read over to him at the meeting of the Board when he first made the bargain. He told the Board that he must have his "incidental expenses." Had never told any member of the Board that the cost of the schools would be about £1,500.—By the Jury: When the Board agreed to reduce the cost of the building it was decided that witness should be paid for his trouble in altering the plans.—His Honour said he should submit five questions for the considerations of the jury. The agreement was clear and distinct that the architect should be paid 5 per cent. upon the building outlay, and his reasonable travelling expenses. The first sum which was admitted to be fairly and properly paid was £89 5s. 5d., as commission upon the £1,785, which was the actual sum the school had cost. The first question was, what was a fair remuneration for the second set of plans? Mr. Trevail had prepared one set of plans, accompanied by specifications, which made the Board tremble about the cost they were about to incur. They asked Mr. Trevail to prepare a fresh set of plans, and he was of opinion that he was entitled to be paid a fair amount of money for his trouble and expense. The only evidence they had of the amount to which the architect was entitled was that of Mr. Trevail himself, who set it down at from £25 to £30. The next question was, was the defendant entitled to any commission on the price of the school furniture, or for the trouble he took in ordering it? The letters from the Board showed clearly that they had consulted Mr. Trevail in the matter. Was defendant entitled to any payment for measurement of extra work? and, if so, was two guineas—the sum mentioned by Mr. Trevail—a fair sum? Another query was, how many journeys did defendant make, and what was he entitled to be paid? And lastly, was he entitled to any sum for stationery, postage, &c.—The jury, after a brief consultation, found Mr. Trevail entitled to £15 for the second set of plans, two guineas in the matter of ordering the furniture, his full charge of two guineas for the measurement of extra work, and his full charge of £11 11s. 4d. on account of his journeys.—They awarded nothing on the question of postage, stationery, &c.—His Honour reserved judgment, in order to consider the technical objections offered by Mr. Collins.

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CHIPS.

The Derby Town Council on Monday resolved to pay the borough surveyor a salary commencing at £400 a year, and to be increased to £600 by 1884. A committee had recommended that the salary commence at £450 and rise to £700.

New schools are being erected at Blaengwawr for the School Board for Aberdare. Mr. John Morgan is the contractor.

A new Congregational Church was opened at Sawston, a village seven miles south-east of Cambridge, on the 7th inst. The building has cost £1,800.

Our Office Table.

The Metropolitan Board of Works is, remarks the *Echo*, really very unfortunate. If it pulls down large blocks of old houses, the poor people, who are driven out only to be still more crowded in other blocks of old houses, complain that their condition is rather worse than it was before. If the Board pauses in the work of demolition, and simply shuts up the houses without pulling them down, rigid economists grumble at the money which might till the last moment have been taken for rent, thus relieving the rates. But if the Board continues to allow the condemned houses to be temporarily occupied, it is likely to be summoned before the magistrates as the owner of house property unfit for human habitation. There is something delightfully humorous in a Vestry summoning a Board for not obeying the orders of a Sanitary Inspector, especially when the Board in question has acquired the property in dispute under the Artisans' Dwellings Act. How much longer shall we be governed by local bodies, each pulling their own way, and acting so little in harmony that they spend the money of the ratepayers in legal proceedings against each other?

A movement has been set on foot at Hampstead for the establishment there of an "Hospital or College of the Guild of Arts and Letters," with the view also of preserving a picturesque portion of the Wells Charity Estates, on which stand some fine trees, in many respects of "even greater beauty than the far-famed Burnham beeches, and equally worthy of being preserved at any cost." The movement has already received considerable support, and it is now sought to raise subscriptions from all interested in art and literature to carry out the twofold object in view, by which a retreat and "haven of rest" would be secured for disabled artists and men of letters, and a picturesque site be preserved to the public.

There is now approaching completion one of the largest and costliest additions ever made to the dock accommodation of ports on the north-eastern coast of England. It is at West Hartlepool, and has been carried out by the North-Eastern Railway Company at a cost already of about £400,000, while a further expenditure, after the close of the present year, of over £32,000 will be needed to insure completion. The new deep-water dock at West Hartlepool is one of the main features of the scheme. Originally planned for a five-acre dock, is has been extended. Approached from the older Jackson Dock at West Hartlepool by an extensive waterway or basin, the deep-water dock is reached, its extent being about eight acres and the depth 31ft., or about 4ft. more than the older dock. From this deep-water dock there is, by an intermediate dock and a lock or basin, about 170 yards long, a communication with the outer harbour at Hartlepool. The works have been directed by Mr. T. E. Harrison, the chief engineer of the North-Eastern Railway, the resident engineer being Mr. C. Harrison; the contractor is Mr. Walter Scott, represented locally by his manager, Mr. Middleton.

The Bishop of St. Alban's has caused a notice to be affixed to the south door of the Abbey Church to the effect that Sir E. Beckett has applied to him for a faculty to continue the work of restoration, and particularly to restore the western front of the Abbey. The notice is addressed to all the clerks and literate persons in and through the diocese of St. Alban's, and mentions that it has been represented to him by Sir Edmund Beckett that a faculty was granted to the Restoration Committee on the 27th March, 1877; that the said committee, with such funds as were subscribed for the purpose, proceeded to execute the repairs and restorations most urgently needed, and have exhausted all such funds, and have become liable, under contracts, for more money than has been subscribed, and have no prospect of being able to do any more at present; that the said Sir E. Beckett is willing to continue the work at his own expense, and particularly to restore the western front of the church, except the three porches (for which a separate subscription is being raised among the Freemasons of England), and to insert in the dark bays of the aisles, or some of them, windows similar to those now in the other bays, without prejudice to the right of the said committee to do any work not at the time undertaken by him when they have funds for the same. An intimation is given that, in the absence of any sufficient cause to the contrary, a license will be duly granted to Sir E. Beckett for the purposes aforesaid.

If we are to believe all we hear, New Italy seems bent on removing all that recalls Old Italy. In Perugia one of the finest mediæval stained glass windows has been removed in order to make way for what is styled "a modern Munich monstrosity." Florence has distinguished itself by sweeping away as much of the picturesqueness of the old city as it had the means of removing. Its municipality have done for Dante's house what the municipality of Antwerp did for Rubens's. They have renewed it in such a style that nothing of the old building remains. An English resident in Florence puts the case very fairly when he says:—"Italy owes to the relics of the good taste of her children of centuries ago a great part of her present material prosperity, for the flood of travel setting this way comes not to the call of to-day, but to the echoes of antiquity; and when the modern municipalities shall have replaced the work of the middle ages by that of the 19th-century architects, and the work of Titian and Tintoretto by that of modern restorers, those who would in full consciousness of cause praise the work of time must go to South Kensington, Spain, China, Japan, or India, where municipalities have not got to work yet."

The twin towers of Cologne Cathedral are now the highest buildings on the earth, the height they have attained being five feet higher than the tower of St. Nicholas's Church in Hamburg, which has hitherto been the highest edifice. Ultimately they will be 51ft. 10in. higher. The *Cologne Gazette* gives the following as the heights of the chief high buildings in the world:—Towers of Cologne Cathedral, 524ft. 11in. from the pavement of the cloisters, or 515ft. 1in. from the floor of the church; tower of St. Nicholas, at Hamburg, 473ft. 1in.; cupola of St. Peter's, Rome, 469ft. 2in.: cathedral spire at Strasburg, 465ft. 11in.; Pyramid of Cheops, 449ft. 5in.; tower of St. Stephen's, in Vienna, 443ft. 10in.; tower of St. Martin's, at Landshut, 434ft. 8in.: cathedral spire at Freiburg, 410ft. 1in.; cathedral of Antwerp, 404ft. 10in.; cathedral of Florence, 390ft. 5in.; St. Paul's, London, 365ft. 1in.; ridge tiles of Cologne Cathedral, 360ft. 3in.; cathedral tower at Magdeburg, 339ft. 11in.; tower of the new Votive Church at Vienna, 314ft. 11in.; tower of the Rath-haus at Berlin, 288ft. 8in.; towers of Notre Dame at Paris, 232ft. 11in.

The usual fortnightly meeting of the Liverpool Engineering Society was held at the Royal Institution, Colquitt-street, on Wednesday evening last, when Mr. Alex Ross, C.E., vice-president, read a paper on "Railway Junctions, Gradients, and Curves." The author in the first place dealt in detail with junctions, and the methods and appliances employed to enable vehicles being transferred from one line of rails to another. After enumerating some of the considerations which the engineer has to take into account in selecting the route for a line of railways, such as whether the interchange of traffic will be between the terminal points or local, the directions of its flow, and whether it is so assured as to warrant a first-class line with the consequent heavy expenditure in works, or the prospects are such as only to encourage a line following as nearly as possible the surface of the ground, the author pointed out that the capabilities of a line depended very much on the nature of the gradients and curves in use on it, and proceeded to show the effect of these, as well as the resistance due to friction and the atmosphere. The appliance known as the "locking bar," for securing junction facing-points was next described, by means of which it is impossible for the pointsman to signal an approaching train to advance until he has first adjusted the points, nor can he in any way alter the position of the points while a train is passing over them.

Mr. A. C. Martin, a well-known American architect, died in Boston on Oct. 29, from the effects of an accident. He was a member of the American Institute of Architects, and one of the founders of the Boston Society of Architects, of which he was for some time secretary. He died in the prime of life, being forty-eight years old, and in the full activity of a successful practice. [He was the architect of many buildings in and about Boston—country and city dwellings, shops and warehouses, hotels, school-houses, and churches. He had in early life, in obedience to his father's requirements, learned a trade. He preferred, however, to be an architect rather than an engineer, and entered the office of Mr. Arthur Gilman, who then had a large practice in Boston. Later he went into partnership with Mr. S. J. F. Thayer. After eight or ten years of busy practice he came to Europe in 1867, where he spent a year in professional study and travel, at which time he dissolved his partnership. Returning to Boston he continued his professional work actively till his death. He was driving home with one of his clients after a professional consultation when an accident occurred at a drawbridge which they were about to cross, and Mr. Martin, getting down from the carriage, was run over by a frightened horse and received injuries from which he died four or five days after.

The marble fragments which form the pedestal for the statue of Victory in the inner court of the Louvre, are now, according to the *Echo*, being diligently pieced together. They represent the front portion of a Greek war-ship. In 1863, the French Consul, M. Champoiseau, who was entrusted by the Government with an archæological commission in the island of Samothracia, discovered the statue of Victory, and sent it to Paris. On account of his want alike of money and of time, he was compelled to leave the marble pedestal of the figure behind him, which remained on the island until quite lately. The present Government, however, provided the enthusiastic M. Champoiseau with the necessary funds for obtaining the twenty-four marble blocks of which the pedestal consists, and for shipping them to France. Each block weighs from 1,060 to 2,500 kilogrammes. The pedestal is a work of absolutely unique interest, as it is the most complete model of a ship of war (280 B.C.) which antiquity has left.

Cleaned-up brasswork, if left in damp sand, acquires a fine brown colour, which, when polished with a dry brush, remains permanent and requires little cleaning. A green and light coating of verdigris on the surface of the brass may be made by means of dilute acids, allowed to dry spontaneously. The processes are, however slow, and quicker means have to be adopted. Before bronzing, the brass is annealed, pickled in old or dilute nitric acid, till the scales can be removed from the surface, scoured with sand and water, and dried. Bronzing is then performed according to the colour desired. A steel-grey colour is deposited on brass from a dilute boiling solution of chloride of arsenic; and a blue, by careful treatment with strong hydrosulphate of soda. Black, much used for optical brasswork, is obtained by coating the brass with a solution of platinum, or with chloride of gold mixed with nitrate of tin. The Japanese are said to bronze their brass by boiling it in a solution of sulphate of copper, alum, and verdigris. Success in bronzing greatly depends on the temperature of the brass or of the solution, the proportions of the metals used in forming the alloy, and the quality of the materials; the moment at which to withdraw the goods and the drying require attention.

A very serious accident happened yesterday morning in the Tottenham Court-road, which in its fatal consequences resembles the Haymarket catastrophe. A loss of one life, if not more, and the injury of several workmen, have been reported. It appears at a quarter to 8 yesterday morning, 14 workmen were engaged in the alterations of two houses, 171 and 172, Tottenham Court-road, formerly occupied by a furniture dealer, when, without any previous warning, they fell in with a loud crash. The work of alteration was being carried out by Mr. R. Shields, contractor, of Sekforde-street, Clerkenwell; and from what we have been able to see for ourselves and gather, the houses were in a very dilapidated and ruinous condition. Inspecting the ruins, a mere mass of *débris*, we observe that the cause of failure has been apparently the giving way of the party wall dividing the two houses. The structure has certainly given way in the centre, to judge from the position of the first floor, the joists of which run from back to front, and are still visible, with a small rolled iron girder below them, though dragged down by the fallen materials. It was at the angle formed by the broken beams and girder of these floors that the body of one man, E. Boyle, a carpenter, was found, and extricated by the police inspector, and it is supposed the second floor had fallen on him. The labour of rescuing the other unfortunate men has been continued all day, and seven have, we hear, been got out, several of them having had a miraculous escape, especially one poor fellow, whose hands and arms were jammed between the timbers. We have heard, though we do not pledge the accuracy of the statement, that the ground and first-floors were about to be thrown into one, to give additional height (about 16ft.), and the first floor was being raised. The houses were of four stories in height, and stood between two substantial-looking buildings on either side. At the present moment it would be rash to

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hazard an opinion upon the cause of the fall—whether it was owing to a careless underpinning of the party wall, or to negligence in removing shores. Appearances, however, strongly favour the idea that the walls were being tampered with, as the brickwork is entirely broken, and the fragments of front wall displaced.

A FIRM in Aldermanbury, according to the *Artisans' Year Book*, are introducing a perfectly novel and unique invention for enlarging or reducing designs, which they call the pandograph. It is most simple in construction. The design, being first drawn on stone, is transferred to a sheet of indiarubber covered with a prepared composition. This sheet of indiarubber can then be stretched or shrunk with mathematical accuracy to the exact size required, and the design again transferred, the transfer being taken by means of a litho. press, not manual pressure. Thus a large picture can be reduced with clearness and delicacy to almost the size of a postage-stamp. A further advantage claimed by this machine is that it distorts designs to suit any particular space, making a square into an oblong or a circle oval. The accuracy, which can be relied on, is a point of importance to map printers, and the clearness with which even the most delicate designs are reproduced will make it a valuable help in many trades.

THE first ordinary meeting of the Session 1879-80, of the Royal Institute of British Architects will be held on Monday evening, the 1st December. The usual certificates will be presented to Messrs. Capel, Herford, Jacques and McLachlan, past candidates in the class of proficiency at the Voluntary Architectural Examination, 1879. The Ashpitel Prize will be presented to Mr. Capel, and a reward of merit to Mr. Scott, who distinguished himself in the preliminary class at the same examination. The formal presentation of the gift, made by Professor Donaldson, Past President, of a gold badge and chain of office, to be henceforth worn on certain occasions by the President for the time being, will take place after the usual preliminary business. The opening address of the session will be delivered by Mr. John Whichcord, F.S.A., the President.

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Holloway's Ointment should be well rubbed upon the pit of the stomach and region of the heart in that particular form of indigestion which gives rise to palpitation, shortness of breath, and a suffocating sensation. Every distressing symptom soon yields, digestion becomes easy, the spirits light, and good health returns.—[ADVT.]

CHIPS.

At a vestry meeting held at Newent, Gloucestershire, on Thursday week, it was resolved to carry out certain works of restoration in the parish church in accordance with recommendations in a report by the late Sir Gilbert Scott.

Sir E. C. Kerrison has recently erected at Hoxne, near Eye, a reading-room and library, which were opened to the villagers on Tuesday week. At the apex of the gable is a carving representing St. Edmund, king and martyr, who was slain close by, and also the old bridge over the Gold-brook. The furniture is of pitch-pine, and the floors are of oak paving. In the library, which contains already 400 vols., is a case over the mantelpiece containing some of the rich "finds" of the locality, including two stirrups, one of the 12th century and the other of the 13th or 14th, both found near the Gold-brook; an Anglo-Saxon knife, or scramasax, and a spear of the same period, found near the same spot, and a flint knife, dug up at Hoxne. The building stands near the Gold-brook, and close also to Oakley Park, the seat of Sir Edward Kerrison. Mr. Collins was the architect, Mr. Wm. Outlaw clerk of the works, and Mr. Frederick Huggins did the bricklayer's work. The stone carving on the outside of the building was executed by Mr. Harry Hems, of Exeter.

The parish church of Chesterton, one of the suburbs of Cambridge, is being restored from the designs of Mr. W. Smith, of John-street, Adelphi, W.C. The church is of the 14th century, and the works in course of execution are reflooring, reseating, opening out two windows now blocked up, and repairing the porch and tower, the total estimated cost being £2,200. Messrs. Rattee and Kett, of Cambridge, are the contractors.

The foundation-stone of the Isle of Wight Proprietary College was laid at Ryde by the Bishop of Winchester on Tuesday.

The Free Library committee at Luton on Monday accepted the tender of Messrs. Smart Bros., of Luton, to erect the required building for £1,648.

There seems to be scope for the operations of enterprising builders at Halstead if the statements made at the last meeting of the Local Board of Health are reliable. Dr. Kellett, the medical officer of health, reported, giving a deplorable account of the present cottage accommodation of the town. "In all the back courts the houses, besides being badly built and ill-ventilated, are so small that they are unfit for any ordinary family to inhabit. An order to abate nuisances is practically an order to the inmates of these houses to leave the town and give up their employment." In the discussion which followed this was confirmed, and members stated numbers of people of a higher social position would gladly reside in Halstead if suitable houses could be obtained, while one speaker suggested that the stringency of the Local Board's by-laws had something to do with the lack of accommodation.

At the annual meeting of the Town Council of Ipswich, the joint museum committee reported that they had received ten tenders for the new museum and school of art, proposed to be built in High-street, from Mr. Horace Cheston's designs, ranging from £6,990 to £8,167. They recommend the adoption of the lowest, that of Messrs. J. B. and F. Bennett, of Ipswich. This was adopted, satisfaction being expressed that the tender was under the estimated cost proposed in the competition for designs. Mr. B. Binyon, of Ipswich, the successful architect in the new corn exchange competition, was instructed to prepare drawings and specifications, and to procure tenders, it being stated that he had guaranteed the amount of his estimate, £17,800. Since this meeting the demolition of the present corn exchange, to make room for the new post-office to be erected from Mr. John Johnson's designs, has been commenced by the contractors, Messrs. Jones and Co., of Gloucester.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Institution of Surveyors. Paper by J. Smalman Smith on "The Law of Fixtures," 8 p.m.
Society of Arts. "The Chemistry of Bread and Breadmaking," by Professor Charles Graham, D.Sc. Cantor Lecture, No. 1, 8 p.m.
TUESDAY.—Institution of Civil Engineers. Paper by W. Carson, M.I.C.E., on "The Light Draught Passenger Steamers of the Thames, the Mersey, and the Clyde," 8 p.m.
WEDNESDAY.—Society of Arts. "Suggestions for Dealing with the Sewage of London," by Major-General H. Y. D. Scott, 8 p.m.
St. Paul's Ecclesiological Society. Discourse by E. B. Ferrey, F.R.I.B.A., on "Old St. Paul's"—Illustrated. St. Paul's Chapter House, 7.30 p.m.

Trade News.

WAGES MOVEMENTS.

CRIEFF.—All the master joiners at Crieff have now intimated to the operatives that on and after Tuesday their wages will be reduced from 5½d. to 5d. per hour.

NORTH WALES SLATE TRADE.—After a long period of almost complete stagnation, a slight improvement is perceptible in this, the staple industry of North Wales, as shown by the increased shipments at Portmadoc, the chief outlet for the Festiniog quarries. Notices have, however, been posted at the Welsh Slate Quarry, one of the largest in the Principality, notifying a reduction of working days to four weekly, a change rendered necessary by the late heavy fall of *débris* into the workings. At the Penrhyn and Llanberis quarries the output is still limited to four days per week, and in consequence of the fall from the mountain, which has blocked some of the workings in the former quarry, 50 bargains, representing about 3,000 quarrymen, will have to be abandoned at the next monthly letting.

POTTERIES.—The arbitration as to potters' wages at Hanley, before Lord Hatherton, terminated on Saturday. His Lordship said he would carefully consider his decision.

SHEFFIELD.—The operative plumbers of Sheffield on Monday went out on strike against a reduction from 8¼d. to 7½d. per hour. The men's wages would have been unaltered from the present figure of 36s. a week, as the masters offered to give four hours' work extra to make up the loss to the men.

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THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 28, 1879.

THE FUTURE OF PORTLAND CEMENT.

THE manufacture of Portland Cement is at the present time passing through a crisis in its history. The inventions of Messrs. Goreham, Johnson, and Michele have rendered unnecessary nearly half the plant formerly required, and works of the type in common use only a few years back will soon have become obsolete. Thus by the use of a minimum quantity of water and the employment of mill-stones for reducing the mixture of chalk and clay to a fine state of subdivision, as specified by Mr. Goreham, the "backs," covering a large area of ground, can be wholly done away with; and the mode of employing tunnels or chambers attached to the kilns, patented by Mr. I. C. Johnson, obviates entirely the necessity for coke-ovens, drying-floors, and some of the most costly and troublesome of the processes which have until recently been considered indispensable to the manufacture.

Nor is it merely in the processes used in the production of the cement that important changes are impending; the whole system of testing the cement will be likely, sooner or later, to be modified, and already in Germany it has been decided to abandon the present unsatisfactory plan of testing the neat cement, and to introduce one standard system throughout the entire country of employing for this purpose test-briquettes made from a mixture of cement and sand. One important fact, which must not be lost sight of, is the great reduction in price which has been already established by the simplifications introduced into the manufacture.

At the present time there can be but little doubt that in London it would be almost as cheap to use Portland cement mortar as to employ that made from the grey chalk limes now in almost general use in the Metropolitan district. It would be extremely difficult to persuade architects, engineers, and builders that such is the case; and we shall perhaps be thought rather over-sanguine in making such an assertion; but we are convinced that the time is rapidly approaching when Portland-cement mixtures will drive common lime mortar out of the field. Let us glance at the relative prices of cement and lime mortar, assuming that the cost of mixing them per yard of sand is the same in each case, and taking it at 2s., though in reality it is far more difficult to slake, and thoroughly mix lump-lime and sand than to make a mortar from Portland cement. 1st. As concerns prices: Portland cement is sold by the manufacturer by the ton of 2,240lb. The retailer, for the purposes of the London trade, puts up ten sacks each of 200lb. nett, and sends out 20 "centals" of 100lb. each as a ton of cement, looking upon the remaining 240lb. as part of his profit. Our advice, therefore, to large consumers is to buy by the ton, not by the ten sacks.

The manufacturer, however good and perfect he may make his cement, finds that at the present prices it does not pay him to sell all his cement in what we may term a "potential" condition; neither do any of the existing tests necessitate that he should do so; he, therefore, sends out a mixture of from 80 to 90 per cent. of Portland cement, and from 10 to 20 per cent. of "core," or hard particles, which certainly have no beneficial action, and may even be productive of serious injury to the consumer. If, as manufacturers assert, the present competition in the cement trade renders unavoidable this slovenly mode of grinding, or rather this neglect of sifting. it would be far preferable to permit Portland-cement makers to add, to sifted cement, from 10 to 15 per cent. of fine grained sand, pulverised quartz, or slag, and to sell such a mixture as "adulterated cement."

By a strange anomaly, writers upon the subject, and even some experimenters, have made use of the argument that because, under certain conditions, a heavy cement (with 15 per cent. of residue, when passed through a sieve of 1,600 meshes to the square inch) will give better results when *tested neat*, if this residue is left in, than if only the fine particles are tested, therefore there is no object in the removal of the core; forgetting entirely that in practice such cement is not *used neat*, and that under a sand-test, with two or three parts of sand, this apparent advantage in the presence of the coarse particles at once vanishes. Another very singular fact is that in nearly all sieve-tests which have hitherto been suggested, a minimum residue with a certain-sized mesh is propounded. Now if there is to be any good in the sieve-test at all, and we hold this to be the most important of all tests with Portland cement, the entire absence of core with a sieve of a certain named number of meshes must be insisted upon. The sieve-test should read: "The whole of the cement must be so ground as to pass through a sieve containing 40 × 40 = 1,600 meshes to the square inch, without any residue." It is curious how wrongly manufacturers regard this question of sifting. We were talking quite recently with a prominent cement-maker on this subject, and he said: "If my cement had to be reduced to such a pitch of fineness, I should have to give up the business, as I should never get through the grinding." We asked him if he could give us even the roughest estimate of what the extra cost might be, and he replied, "Half as much again as at present." On checking some of the cement as it ran from the hopper of the mill-stone, with a sieve of the size named, there was found to be a residue of 12½ per cent. of core. When we pointed out that the total extra cost could not possibly exceed the expense of re-grinding this percentage of his present output, plus the cost of sifting, and raising the core back again into the stones—the expense of the two latter operations being admitted to be almost inappreciable, he said he had never considered it in this light, but had thought of the power and labour necessary to grind *all his cement* fine enough to go through such a mesh at a single operation!

This is rather a long digression from the subject of the cost of cement; but it has been necessary, in order to prove that nearly all the cement in the market is degraded to the extent of nearly 20 per cent. by inert and unprofitable ingredients. As a forcible illustration of this, we once pointed out to an engineer who had been sending 10,000 tons of Portland cement to some large works in Russia, and who told us that the cost of transport exactly doubled the prime cost of the cement: "You have expended about £3,000 out of the £20,000 in sending grit to Russia, and this you might have saved by having all the cement sifted in this country before it was put into casks."

The cost of Portland cement, bought by the ton, and specified as capable of undergoing the usual tests, was, for a large work on the South Coast, recently quoted at 31s. 9d. This would imply a price in the London district of about 30s. per ton of 20 bushels at 112lb. each, or, say, 31s. 6d. per cubic yard of 21 bushels. Taking sand at 4s. per cube yard, and a mixture of 5 yards of sand to 1 yard of cement, which, with sifted cement, gives a very excellent mortar; we get for 31s. 6d. + 20s. + 10s. for mixing, 5½ yards of cement mortar at a cost of 11s. per cubic yard.

Grey lime is still sold in London, to the great advantage of the dealer, by the cubic yard, which is a survival of the obsolete "hundred," as we pointed out in a former article; but, without attempting to show what is obtained for a yard, we will ask our readers to assume that a cubic yard of grey lime, containing 21 imperial bushels, which we require for comparison with Portland, may be supplied for 10s. With this quantity, whatever specifications may have to say upon the subject, we have found, from careful observation, that the "intelligent Irishman" who makes the mortar uses 2 yards of river sand, or 2½ yards of pit sand (say the latter, to make out as good a case for lime as possible), and he obtains only, at best, 2½ yards of lime mortar for 10s.+10s., and 5s. for mixing, or 10s. per cube yard, as against 11s. for Portland-cement mortar. The former being a very poor and miserable imitation of the result obtained from the use of cement, which we trust soon to see taking its proper place as a London building material. It is true that this calculation implies an actual cubic yard of *pure* Portland cement, and one of freshly-burned lump-lime, and both at prices rather below those to which we are accustomed. It is also true that lime could be sold much cheaper, and that Portland cement has perhaps been forced down to its lowest paying price. Still, with a difference of only 10 per cent. in the cost of the mortar, there should be no hesitation in the choice of which to use. The reduction in the cost of making Portland by the modern process, in the one item of fuel alone, shows a saving of 50 per cent.; the amount of coke used being stated for all purposes at from 8 cwt. to 10 cwt. per ton of finished cement.

We wish to say a few words, in conclusion, on the German system of testing a sand mixture, in lieu of the neat cement. As we have stated on previous occasions, the existing plan of insisting on a cement of a given weight per imperial bushel is, when unchecked by the sieve, a direct incentive to imperfect grinding; as it is far easier to prepare a cement with 20 per cent. of coarse particles, weighing 118lb. per bushel, than one much more finely ground and deprived of its coarse particles, which would weigh only 110lb. Many engineers have been accustomed to regard cements ranging from 112lb. to 120lb. per bushel as superior to those weighing under 112lb.; it is, however, impossible to form any opinion on this point unless the fineness of the particles had been ascertained. The experiments of Mr. Colson bearing on this subject, published in the *Transactions* of the Institution of Civil Engineers, are of the utmost value. Theoretically speaking, we believe that there is no good object gained in aiming at a cement of over 110lb. to the bushel. Indeed, we doubt if any cement deprived of its core by passing it through a 40 × 40 mesh sieve could be made to surpass this weight.

A great impediment to the sand-test is the fancied difficulty of obtaining a sand of uniform quality. A pure quartz, crushed to a powder which shall consist of grains rejected by a sieve, say, of 2,500 meshes to the square inch, but deprived of all grains too large to pass through a sieve containing 900 meshes, could be procured all over the country, and would surely be sufficiently uniform for the purpose. The section for fracture which had been selected in Germany, of only 5 square centimetres, certainly appears small for the briquette; but we must remember that the smallest sectional area capable of giving reliable results is the one which will expose us to the smallest margin of error, due to imperfection in filling the mould, and gauging the compound of cement and sand. Whenever the sand-test becomes adopted by English cement-users, we expect to see the area of $1\frac{1}{2}$in. by $1\frac{1}{2}$in. selected, in preference to the standard area of 0·78 sq. in. chosen in Germany.

The last and perhaps the chief objection to the German sand-test is the twenty-eight-day period, which must intervene between the testing and use of the cement. We are not yet quite certain that an interval of more than fourteen days is necessary, and by adopting this limit, with two instead of three parts of sand to one of cement, we think the chief argument against the sand-test would disappear. It is a matter which no longer admits of any doubt, that for many of the dense cements now in such high favour with our English engineers, the seven-day test does not permit of a sufficient amount of induration to show the action of the cement at its best, as compared with a lighter cement tested in a similar way. The sand-test, strangely enough, brings out the high quality of a cement much more effectually than the mode of testing now in use, and admits of far more uniformity in the results.

It is a pity that no central body exists in this country, capable of uniting all the principal men interested in the employment of Portland cement, either as architects, engineers, builders, or manufacturers. Failing such a central authority, a joint meeting of the Royal Institute of British Architects and the Institution of Civil Engineers might be convened to report on this matter, as was done in Germany, and to decide upon some uniform plan of testing. We see no reason why this should not be accomplished, to the great benefit of all English users of Portland cement.

THE WINTER EXHIBITION AT THE DUDLEY GALLERY.

GENERALLY the winter exhibition at this gallery contains some very excellent pictures, but this year we cannot bestow quite the same praise. Some of the works appear as if they had been rather hastily finished, others look like contributions sent to help cover the walls. We do not think any the less of a picture because it has not found its way to the Academy, nor even of "studio-sweepings" as they are called; for it is a well-known fact that good paintings, like good books, often lack the qualities that render them welcome to the general run of connoisseurs. The Dudley Gallery, though it does not quite come up to our expectations, contains a few works of undoubted merit in that particular phase of art it usually more especially illustrates. In truthful painting of real life, Mr. Arthur Hill's "Maggie" (7) is all that we can wish; the eyes and face are expressive. Mr. W. Magrath's picture, "On the Old Sod," is thoroughly realistic; the figure of the old shepherd is the central and chief object, besides the grass, that attracts notice, and yet there is some force of character in the painting, and the colouring is subdued. Mr. Walter Crane sends a subject illustrating an old nursery rhyme, "This is the dog that worried the cat." It is handled in the artist's usual vein; the colouring is quiet, and the composition conventional. "Dolce Far Niente" (13), by Mr. J. W. Waterhouse, is a pleasing study, rendered with much grace, and with a wealth of colour befitting the subject. Mr. Arthur Severn's "Evening on the Thames" (25), is a pleasing sketch of the river from the Surrey end of Westminster-bridge, as observed when the evening mists have obscured all save the outline of the Palace and its tower. The clock-tower is certainly too bulky, and the upper clock-story does not project enough. Another sketch of the latter tower appears on the opposite side of the Gallery, a comparison with which will show that either Mr. Severn or Mr. Rischgitz's view errs much. The latter is right. "Winter" (20), by T. F. Goodall, is well painted, though rather hard. "In the Court of the Doges' Palace, Venice," by Mr. Eastwood, is not true in the drawing, and there is a harshness in the colouring; but "Pleasant Company Makes the Way Short," by Heywood Hardy, is cleverly told—a gentleman and lady, both on horseback, are just about crossing a ford, which they appear hardly to have recognised. Mr. A. D. Lancaster's study "Day," representing a girl's face, is classical in spirit, though rather stiff; a roseate hue pervades the picture. "Spring," by E. F. Brewtnall (26), is a study conceived in a different vein; a young lady is enticing a cat which is sitting on the fence. The May-blossom is well painted, and the artist has contented himself in rendering nature. "Cave Canem" (No. 51), by Briton Riviere, A.R.A., is a clever cabinet-picture. The white puppy seated on the doorstep and the stone threshold are both faithfully painted. One of the best pictures is by Leon Lhermitte, whose works are always characterised by breadth of treatment and a quiet colouring. His "Le Marché de Château-Thierry" (57) is a pleasing market-group of figures, painted with considerable truth and feeling; the houses forming the background of the old French market-place admirably sustain the busy throng in front, and the drawing is excellent. Miss Alice Haver's in "The Spring" (56) exhibits a composition of a pleasing kind; the stooping figure is graceful, but there is a want of solidity and relief in the painting that is unsatisfactory. "Her Dog," by J. C. Dollman, sustains this artist's ability as a painter of quiet humour; the young dandy seated on the couch, dressed in the Georgian costume, with flowing coat, cuffs and frills, powdered wig and cocked hat and knee-breeches, is well painted, and the furniture quite in keeping with the period, while the little sullen dog appears to resent the overtures made to him. The limbs in "A Bacchante" (64) are certainly too slender; "On the Hill," by Frank Walton, a Scotch moor, is vigorous, and the yellow-blossomed gorse naturally painted. Rather over-mannered and stiff in drawing is the picture of "Backyard at Ramsbury Manor House, Wiltshire," by G. D. Leslie, R.A. The building is carefully detailed, and the wooden arcading and prim borders typical of the style. "In the Valley" is another prettily-painted piece, by Frank Walton, truthful in the contrast between the dark evergreen and the leafless elms, and handled with much vigour. "Blackberries" (77) is also a piece breathing of the country; the figure of the girl is graceful and the bushes and sunset sky faithfully painted; it is by Frederick Morgan. Simple in drawing and quiet in colour is a cabinet picture by Augusta Wells, entitled "A Young Dairymaid"; (No. 99) is equally coarse and harsh in colouring. Mr. Theodore Hines contributes a pleasing sketch of rural vegetation in "Weeds" (102), but we cannot say Mr. Lewis's "Home" (104), is happily conceived—it is crowded, and what there is characteristic we hardly know, unless it be the infant prattling on the floor and the sunlit garden seen through the open doorway. The execution is wanting in vigour. "Water Lilies' (117) is a classically-conceived composition; the colouring is refined and low in scale, but the figure of stooping maiden is coarse, the muscle of arm anatomically incorrect. The same error of drawing is noticeable in Mr. F. Morgan's "Gleaners" (122), the arm between elbow and wrist, showing an unnaturally tumid development of muscle. "A Siesta in Church, Venice," by Charles Cecil Van Haanen is a study of some merit, but the artist has signally failed to give the proper anatomical expression to the muscles of the face of the girl yawning; the effect is unpleasantly strained and unreal. Much too low for easy examination is A. Ludovici's "Les Travailleurs de la Mer" (140); children on a sandy beach building sand forts. All we can say is, it is a pleasing cabinet picture in which the detail has not been scamped. A large picture by P. R. Morris, A.R.A., "The Condition of Turkey," has a sarcasm conveyed in the title; the group of well-fed turkeys, with their bright plumage, is carefully painted. Mr. MacWhirter's "Old Rome" (147) occupies a conspicuous position; the merit of the picture resides in the illuminated moonlit sky and cleverly-painted reflected light under the triumphal arch, which fills up the canvas; the architectural detail of coffered vault is lost in shadow. Near to it we must commend H. Fanton's "Roses," though the contrast between the flowers and dark background is rather overpowering. The sea, in "Spindrift" (157), by Henry Moore, is too grey, and the painting is monotonous. The "Scene from Dickens's 'Battle of Life'" (158), by F. Barnard, is carefully painted, and the characters well sustained in demeanour and dress. The "Roses and Clematis," by C. Stoney, is also pleasingly painted, and well grouped. "In the Heat of the Day," by Alice Havers, the artist has tried to convey the effect of the mid-day sun on a common. The woman with the tired little girl in her arms looks fatigued, and the sunlight on the grass is painted with care; but there is a little too much naturalism, and a little shadow somewhere would have intensified the effect. Turning from the tropical pastoral to the frigid delineation of city, Mr. J. O'Connor's "Out in the Cold" has a touch of humour in it. It is a view of the Thames Embankment, with Cleopatra's Needle, on a freezing winter's day; the river has floating ice, and the obelisk is covered with snow. "Rowing Home," by C. N. Henry (190), has its chief merit in the green transparent depth depicted in the water, and the reflection of light under the boat. Mr. Winkfield has given us the impression of a "Winter's Day" in No. 193, and Mr. R. Macbeth of "Lady Bountiful" in 207, both clever in expression and technical qualities. "Dawn" is the subject of an ideal female head, lightly draped and grey-toned, by A. D. Lancaster; but one of the most highly-finished cabinet pictures illustrative of a moral is Mr. Heywood Hardy's "Trial of Patience" (221); an elegantly dressed little girl is watching, with a childish and sweet expression, the patience of her little dog, who is waiting till the cat has finished lapping the milk from a saucer. The grouping, execution, and colouring are admirable. In a different vein, and thoroughly ideal, is a study we may call the gem of the collection (240). The picture is by L. Alma-Tadema, R.A., and illustrates a dark female, quite nude, entering a bath. The red marble base of fountain, the bronze dolphin, the pellucid clearness of the water, are all wonderfully true to nature, and yet an exquisite sense of refinement and grace pervades the piece. Few painters have the gift of being so intensely truthful yet so removed from commonplace, so delicate in handling and yet so free from a frittered manner as the artist of "A Safe Confidant." We cannot say we admire crudely-painted subjects, but the "Naturalist" (267), by Colin Hunter, whatever its merit may be, is much too crude in handling for a serious study. The young boy lying down on the beach certainly looks more sleepy than absorbed in study, and the dark shadows on the distant waves are unreal. Those who had the hanging of the pictures could not possibly have produced a more unhappy contrast than the last and Mr. G. A. Storey's "Letter of Condolence" (275). Here we have a painting of an intensely smooth and soft kind; the face of the young lady replying to letters is extremely namby-pamby in expression. We must take note of J. Tissot's little cabinet called "Quiet," elaborate and realistic as it is; of H. Macallum's "Herring Curers" (284); Mr. J. B. Burgess's "Study of an Eastern Head" (297), rich in colour and expressive in the dark eyes; Mr. Wynfield's "Tulips," a picture over-balanced by the bright colour; "Windfalls" (309); "The Novel" (310)—subjects that are worthy of mention more for their careful painting of features than for any great quality or merit of composition. Mr. Henry's "Reverie" (338), a girl, seated in an old chamber furnished with a fine oak cabinet, playing a guitar, has little in it to attract attention except the accessories of the room; the title seems hardly applicable. Mr. Clausen's "Novel" (310) we may call "a harmony in orange and black"; "A Dabbler in the Science" is an amusing incident, but with little that is forcible in composition. The "Shortest Way," by F. S. Muschamp, is a simple incident with a touch of irony and humour in it. Mr. C. Vernède, in 357, has contributed an exquisite study of foliage feelingly rendered; the "Early Morning at Burnham Beeches" (387), by H. Caffieri, is also a clever bit of rural scenery. We can only afford space to enumerate a few others, such as No. 401, "Gossips," in which there is a want of scale in the faces of the girls; "Clavichord and Cither" (410); "A Midsummer Evening" (409), by T. Lloyd – a sparkling bit of river scenery; No. 411, on the screen, a small picture by G. F. Watts, R.A., "Rehearsing the Tableau" and "Dream of Endymion." Architectural subjects are almost absent from the collection. The view of "Antwerp Cathedral," by Jules Lessore (270), is a very imperfect rendering of the proportions and details of the church. "Dordrecht" (346), by A. B. Donaldson, is also exceedingly harsh in colour, and crude.

THE FALL OF HOUSES IN THE TOTTENHAM COURT ROAD.

THE fall of the two houses in the Tottenham Court-road, attended by the death of two of the workmen engaged, which we briefly recorded in our issue of last week, has excited considerable attention. The coroner's inquiry opened last Friday, at the University College Hospital, was attended by several professional men; but beyond the preliminary formalities and particulars as to the circumstances of the accident, little evidence of any value was offered. Until after the jury's adjourned investigation, to be held to-day (Friday), and in the absence of more satisfactory knowledge, it would be premature on our part to express any opinion as to the cause of the disaster. From the evidence of the contractor, Mr. Alfred Shields, and his father, who acted as foreman, it appears that the shops of three houses, Nos. 171, 172, and 173, were in the process of conversion into one, and that Mr. Shields had undertaken by contract to carry out this work, and to do general repairs from plans prepared by Mr. Williams, architect, of Swansea. One of the things to be done was to raise the first floors about two feet by putting in girders in place of the old bressumers, and it was after these new girders had been fixed and during the alteration of the old chimney-breasts that the houses fell. We also have it on evidence that the front and back walls were underpinned. It may naturally be asked how it was such an old and apparently dilapidated building could have been permitted to have been tampered with in the manner we have described; as the party wall was clearly in a very rotten and shaky condition from previous alterations; but to this question we must wait for a reply. An architect may plan certain alterations in an old house without knowing the condition of the walls behind the plastering; the builder may agree by contract to perform those alterations and the district surveyor give his consent, and notwithstanding this concurrence of act and testimony, the building may be utterly unsafe to touch. It is quite possible, we say, for such a condition of things to occur without implying neglect or carelessness on the part of any one. A sudden jar caused by a passing load, a taxing of the structure by additional weight, or the removal of a few bricks, may cause the collapse at any moment. While, however, the germ of sudden dissolution may be lurking unsuspected in the building, we have a right to require on the part of those whose business it is to plan, devise, and carry out alterations of old buildings, a more than usual amount of vigilance and care. In the case before us the alterations, with the exception of the raising of the floors, were of the commonest description. It consisted of making two openings in the party-wall between 171 and 172, and two in the party-wall between 172 and 173, and new shop-fronts, and, according to Mr. F. Wallen, the district-surveyor's, evidence, he was not informed of the raising of the first floors. It is only fair to say that Mr. Wallen wrote a letter to the contractor, reminding him of Sect. 19, Rule 15, of the Building Act, which provides that no chimney-breast built against a party-wall may be cut without his certificate, and observing that he was liable to a penalty for doing such work without a notice. In a further communication the surveyor certified that, on certain conditions being complied with, namely that of shoring the chimney-breasts and putting in good stone corbels under each jamb the full thickness of wall, the work below might be cut away; but we are not yet informed what or whether any precautions of the kind were actually carried into effect.

We can more positively speak of the actual condition of the ruined buildings as they appeared on the jury's visit last Tuesday. The houses that fell were Nos. 171 and 172; only the lower portion of the party and back walls remain standing, all else being nothing but a heap of débris. The party-wall between 172 and 173 is certainly in a shaky condition; vertical cracks are noticeable at the rear end, and the chimney-breasts have been so sadly cut into that we should not like to trust to its safety without the cross-struts that have been recently put up to support it from the house on the other side, and the raking shores at the angles. The yielding of the party-wall between 171 and 172 is clearly the cause of the failure. From our inspection we find it was 14in. to the level of the first floor, and 9in. thick above. It is bulged in parts and has all the appearance of having been cut about for previous alterations, and the chimney-jambs were obviously its main support. The raising of the first floor required the cutting away of a portion of the breasts between the levels of the old and new floors, and this operation needed considerable caution and proper support to the superincumbent jambs. It is easy to see that, by taking away the vertical bearing of the chimney-jambs, a wall, rotten in itself and badly bonded, might buckle and fall. Between the front and back walls there is a distance of about 24 feet; there is a good old wooden bressumer, trussed with iron, which carried the ends of the joists at the back, a new wrought-iron girder in the centre; about nine inches deep; and another rolled beam of iron, 5½ by 4, which took the front ends of the joists. These seem to have tolerably good bearings, piers of 14in. square having been built to carry the front and back bressumers. The joists resting upon them are 8 by 2 and had about 12 feet bearing. The front walls of each house rested on two rolled flanged girders about 10in. deep placed side by side, with plate riveted at the top; these were amply strong enough for their work, which was independent of the floors. Two of these were dislodged and fell, but we do not observe they are damaged or bent in the slightest degree. In fact, the beams and flooring have every appearance of being efficient, and could not have contributed to the failure. The underpinning of the front wall has been mentioned; and the question whether the new piers built to carry the ends of the outer girders were disturbed, is one that has to be answered in determining the immediate cause of the disaster. The two outer piers, however, are at present intact, and would seem to negative such an assumption. We are thus led to believe the structural weakness of the party-wall was the source of the mishap, and it is for the jury to determine whether any carelessness or neglect on the part of those engaged contributed to it. It may be necessary to inquire what the men were engaged in doing at the moment of the occurrence; what were the actual conditions of the shoring, and whether any sudden weight was brought to bear upon the wall; and further, whether the surveyor's request had been duly carried out before the chimney-breasts were cut. It was agreed by the jurymen, before leaving the ruins, to appoint an independent surveyor to examine the premises.

A long letter appears in a daily of Tuesday, signed "A London Architect of Twenty-six Years' Experience," which has an important bearing upon the subject, and to which we may briefly refer. The writer corrects the impression too often formed, that a district surveyor has unlimited control over building operations, whereas, in fact, his authority is confined to giving a notice of any irregularity, or cautioning the builder and giving evidence against him in a police-court. It may, therefore, be days, or even weeks, after the surveyor has seen a flagrant instance of violation of the Act, before he can get the case heard, and in the mean time a catastrophe may happen. As regards dangerous structures, the writer says the "district surveyor is simply an unsupported official witness, and the sole extent of his power is to give his certificate and prove it in the police-court, while there is always no difficulty in the other side getting any number of unscrupulous professional experts as witnesses against him, and so creating a preponderance of evidence for the defence." Unfortunately, the above statement represents too truly the condition of cases of this kind; and the writer goes on to say that absurd statements are made about the necessity of district surveyors being more watchful of buildings, and that the result is to increase carelessness rather than otherwise. It is very true that builders who need watching, scamp the moment the surveyor's back is turned, and this fact appears to make it the more necessary, in our opinion, for inspectors to be appointed to supplement the attention of the surveyor by repeated visits, for it will be a long time before the law is altered to make a contractor legally responsible for his work and liable for violation of his own and others' acts and obligations. We should be glad if contractors could be made responsible agents by Act of Parliament in the manner suggested, but we think the better and more expeditious plan would be to assist our over-worked officials, and prevent, by increased supervision, these repeated, casualties and risks to life and limb, rather than to punish the builder afterwards.

THE LAW OF FIXTURES.

AT the meeting of the Institution of Surveyors held on Monday evening, the President, Mr. William Sturge, in the chair, Mr. J. Smalman Smith, barrister-at-law, read a paper on the legal aspect of the question of fixtures, of which we give a condensed report. At the close of the reading a vote of thanks was cordially passed to Mr. Smalman Smith, on the motion of Messrs. R. C. Driver and T. Huskinson, and after a few remarks from Mr. E. J. Castle, the discussion of the paper was adjourned to the 8th proximo.

Whatever is affixed to the soil becomes, in contemplation of law, a part of it, and is consequently subjected to the same rights of property as the soil itself—*quicquid fixatur solo, solo cedit.* This fundamental principle of the law of fixtures is sufficiently well established; the difficulty is to determine with precision what constitutes annexation, sufficient for this purpose. No doubt this ancient maxim, whatever may be its present value as a guiding principle, was originally applied in all its strictness. It is, in fact, a relic of that ancient feudal principle which rendered every other description of property subservient to the interests of the owner of the realty. In this, however, as in other branches of the law, the necessities of society, and the quickening influences of trade and commerce, have compelled the Courts gradually to relax the strictness of the old rule. Accordingly, we find that the earliest exceptions to the ancient principle were made by the judges in favour of trade, and in relation to those articles necessarily affixed to the freehold for the purposes of trade and manufacture. As the commercial classes increased in wealth and power, personal property, or that description of articles called "movables," became of increased value and importance and exercised a commensurate influence upon the law, and the inadequacy of the old rule to meet the requirements of society was next acknowledged, by excepting such articles from its operation as had been annexed to the freehold for ornament or for domestic use. Notwithstanding, however, the rapid increase in the value of personal property, and the corresponding necessity for some modification of the ancient feudal principles, it was not until the time of Queen Anne that the Courts assumed any extensive powers in restraining the dominant influence of the realty. And the law of fixtures, so far as the decisions of the judges have created it, consists at the present time almost entirely of those exceptions and qualifications which have, from time to time, been engrafted upon the ancient maxim which allowed the property in a movable to be changed by annexation to the soil.

The term "fixtures" has been used by the Courts as applicable both to chattels annexed to the freehold, and thus becoming *irremovable* against the will of the owner of the freehold, as also to chattels annexed to the freehold, but, nevertheless, *removable* at the will of the party annexing the same. This use of the term, in its double and general sense, is approved by Chief Baron Kelly, in his judgment in "Climie v. Wood (*a*). The term "fixtures" is an ambiguous one. It has been defined to be such an annexation as can be removed from land by the party annexing it adversely to the owner; but, in its more general sense, it means any annexation or addition which has been affixed to or planted in the soil of the land. The term fixtures may therefore with authority be taken to include all those articles which are *actually* or *constructively* annexed to the freehold. We shall distinguish merely temporary annexations from such articles as have become by permanent annexation a part of the freehold, by classing them respectively as *movable* and *irremovable* fixtures. Annexation to the soil, either *actual* or *constructive*, being therefore in all cases necessary to constitute a fixture, it will be important to define the meaning applied to the word "annexation" by the more recent judicial authorities. An article is considered to be *actually* annexed to the freehold when it is united thereto by means of bolts, screws, nails, &c., or when by any other and artificial means it becomes actually incorporated with the freehold. An article is considered to be *constructively* annexed to the freehold when, although not *actually* annexed, it forms a necessary and integral portion of "or belongs to" that which is already a fixture, but is in itself separate or capable of easy separation (*d*). With regard to that description of annexation termed *constructive*, it is possible for a chattel to become a fixture, not only where there is no actual affixture to the freehold, but where the chattel is separate and removed from the freehold, and where, nevertheless, for certain purposes and in a limited sense, such chattel is to be considered annexed to the freehold; as, for example, the doors, windows, locks, keys, and rings of a house may be distinct and separate things, and yet they are considered *constructively* annexed to the freehold, and therefore a part of it. And so of any other matter that forms an integral and essential portion of or belongs to "a fixture," although it may be distinct from it. By the grant of a mill the millstone will pass, albeit at the time of the grant it be actually severed from the mill (*c*). So with regard to machinery. If the *corpus* of the machinery is a fixture, all that belongs to that machinery, though more or less capable of being used in a detached state from it, follows the same principle, and remains attached to the freehold (*d*). Another description of articles are considered constructively annexed to the soil, but which are in themselves separate and distinct from it; these are chartered and title-deeds relating to the realty. "A man seised in fee has divers charters, deeds, and evidences," which, as Lord Coke says, the purchaser shall have, "as incident to the lands *et ratione terræ*, for the eviences are, as it were, the *sinews* of the land. Also he shall have all deeds and evidences which are material for the maintenance of *the title of the land* (*e*). Heirlooms also are considered constructively annexed to the land. They are thus defined:—"*Heirlooms*, chiefs or principals, are those things which have continually gone with the capital messuage by *custom*, which is the best thing of every sort, as of beds, tables, pots, pans, and such like of dead *chattels movable*" (*f*); and Lord Coke thus states the law relating to such articles:—"If a man be seised of a house, and possessed of divers heirlooms that by *custom* have gone with the house from heir to heir, and by his will deviseth away the heirlooms, this devise is void. For Littleton here saith the will taketh effect after his death, and by his death the heirlooms, by ancient custom, are vested in the heir, and the law preferreth the custom before the devise" (*g*). Coat armour hung up in a church, ancient family portraits, and ensigns of honour and state are considered things in the nature of heirlooms, and as such constructively annexed to the land (*h*). Also deer in a park, conies in a warren, fish in a pond, doves in a dove-house (*i*), bees in a hive, swans (*j*), and game *feræ naturæ*. It is therefore evident that a very slight affixture to or incorporation with the freehold is sufficient to constitute "annexation," and thence a "fixture" in the generic sense in which the word is now used, and thereupon the question will arise whether such fixture is "movable" or "irremovable." This will be found, more especially in the later authorities, to depend upon those circumstances attendant upon the annexation which serve to indicate the *intention* of the party annexing the chattel to the freehold. The operation of the ancient principle is, in modern law, subordinate to the consideration of the *intention* with which a man must be presumed to have annexed an article to the freehold, and the mere circumstance of *annexation* is not in itself sufficient to determine the question whether that *intention* is or is not for permanent benefit of the freehold *perpetui usus causâ*. There is abundant authority for the principle to which it is now sought to refer all questions concerning annexation to the soil. The great difficulty lies in defining the circumstances from which the law may presume an *intention to permanently benefit the freehold*. These being ascertained, the intention of the party annexing an article to the soil, by so doing to permanently benefit the freehold, will be a question of evidence. If the evidence of the circumstances attendant upon annexation be strong enough to raise the legal presumption of an *intention to permanently benefit the freehold*, the "fixture" will be "irremovable" by the party annexing the same against the will of the owner of the freehold. If, on the other hand, no such intention can be presumed in law from the circumstances, the fixture will be "movable" at the will of the party annexing the same. In *Holland* v. *Hodgson* (*k*), Mr. Justice Blackburn, in delivering the judgment of the Court, said:—"When the article in question is no further attached to the land than by its own weight, it is generally to be considered a mere chattel (*l*) But even in such a case, if the *intention* is apparent to make the articles part of the land, they do become part of the land (*m*). Thus, blocks of stone, placed one on the top of another. without any mortar or cement, for the purpose of forming a dry stone wall, would become part of the land, though the same stones, if deposited in a builder's yard, and, for convenience sake, stacked on the top of each other in the form of a wall, would remain chattels. On the other hand, an article may be very firmly fixed to the land, and yet the circumstances may be such as to show that it never was intended to be part of the land and then it does not become part of the land. The anchor of a large ship must be very firmly fixed in the ground in order to bear the strain of the cable, yet no one could suppose that it became part of the land, even though it should chance that the shipowner was also the owner of the fee on the spot where the anchor was dropped. An anchor similarly fixed in the soil for the purpose of bearing the strain of the chain of a suspension bridge would be part of the land." But neither, on the other hand, must it be concluded, from the mere absence of annexation, that the article in question is a chattel, and to be so dealt with, unless the circumstances are such as to show that it was *intended* to remain so. "Perhaps the true rule is, that articles not otherwise attached to the land than by their own weight are not to be considered as part of the land, unless the circumstances are such as to show that they were *intended* to be part of the land; the *onus* of showing that they were so intended lying on those who assert that they have ceased to be chattels; and that, on the contrary, an article which is affixed to the land even slightly is to be considered as part of the land, unless the circumstances are such as to show that it was *intended* all along to continue a chattel, the *onus* lying upon those who contend that it is a chattel." *Quicquid plantatur solo, solo cedit*, may, on the above authority, be taken to obtain to no greater extent in modern law than that of raising a legal presumption, which—when an article is, however slightly, annexed to the freehold—throws the burden of proof on the party claiming the article as a chattel, or asserting a right to render it such by a severance from the freehold.

The circumstances which have been held to be material for the purpose of determining the intention of a party annexing an article to the freehold, by so doing permanently to benefit the freehold, will be found to be included under the following heads:—1. The relative positions of the parties. 2. The mode and extent of annexation. 3. The nature and character of the fixture and the use for which it is intended.

The incident which has been rightly held entitled to the greatest weight in determining this question of the intention of annexation, is the relation in which the parties stand to each other; and for practical purposes it will be sufficient to enumerate three classes of persons between whom questions relating to fixtures principally arise (*n*):—1. Between different descriptions of representatives of the same owner of the inheritance—namely, between his heir and executor. 2. Between the executor of tenant for life or in tail, and the remainder-man or reversioner. 3. Between landlord and tenant.

1. The right of the executor to remove fixtures and to convert them into personal property against the will of the heir is of very limited extent, and it may be doubted whether in the case where the owner of land annexes articles to the soil for the purpose of more fully enjoying his property, there can be presumed any other intention than to permanently benefit the freehold. The conflicting authorities were reviewed, and the principles of modern law enunciated, in the case of "Fisher v. Dixon" (*o*) in the House of Lords; and it will be convenient to state the law as laid down by their lordships, the authority of which cannot be questioned. "Fisher v. Dixon" was an appeal to the House of Lords against a decree of the Court of Session of Scotland, arising out of the following case:—J. Dixon, deceased, was an extensive coal and iron mine owner, and was at the time of his death engaged in working mines, some of which were his freehold property, having been purchased by himself; while of the rest he was tenant under leases for various terms. A very valuable portion of property consisted of engines, colliery utensils, rails, &c., employed in the business he carried on. After his decease, a question was raised whether these engines, machinery, &c., were to be considered heritable property and to pass with the estate to the heir, or removable property and belonging to the executors. It was decided by the Lords Ordinary that the machinery which was fixed to the soil, and could not be used without being so fixed for the purpose of the profitable use of the land, was heritable, and passed with the land. This decision was affirmed by the House of Lords, and Lord Cottenham then said:—"The principal stress of the argument on the side of the appellant has been that this is to be protected because it is necessary

for the encouragement of *trade* that this property should be considered as not belonging to the real estate." There is no doubt, therefore, that there existed at this time (1845) some considerable authority for the theory that "trade fixtures," even when set up by the owner of the land, were personal property, and removable by the executor. The House of Lords in this important case, declined to give encouragement or authority to such a doctrine; and any doubts that may have previously existed in relation to the power of the personal representative in such cases to remove articles annexed to the soil for the purposes of trade or manufacture were virtually set at rest by this decision.

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(*a*) Climie v. Wood, 3 L. R. Ex. 260.
(*b*) Ex-parte Asthury, 4 L. R., Ch. app. 636.
(*c*) Sheppard's Touchstone, 19.
(*d*) Fisher v. Dixon. 12 Cl. and Fin. 330.
(*e*) Co. Lit. 6A.
(*f*) 14 Vin. Ab. 291.
(*g*) Co. Lit. 185B.
(*h*) Com. Dig. Cemetery.
(*i*) 12 Rep. 105.
(*j*) Co. Lit. 8A, 7 Rep. 90, 91.
(*k*) Holland v. Hodgson, 26 L. T. N. S. 712; 7 L. R. C. P. 328.
(*l*) Wiltshear v. Cottrell, 1 E. and B. 687, and Cases there cited.
(*m*) D'Eyncourt v. Gregory, L. R. 2 Ex. 382. 15 W. R. 187.
(*n*) Elwes v. Mawe, 3 East. 54.
(*o*) Fisher v. Dixon, 12 Cl. and Fin. 330, House of Lords Cases, 9 Jur. 883.
(*p*) Mather v. Fraser, 2 K. and J. ch. 536. *See* also ex-parte Cotton 2 M.D. and De G. 725; Boyd v. Shorrock, 37 L. J. ch. 144; Culwick v. Swindell, 3 L. R. Eq. 249.
(*q*) 29 Car. 2, c. 3.
(*r*) Gawan v. Barclay, 4 W. R. 80.
(*s*) Ex-parte Cotton, 2 M.D. and De G. 725.
(*t*) Walmesly v. Milne, 7 C. B. N. S. 115.
(*u*) Ex-parte Belcher, 2 M. and Ayr 160.
(*v*) Climie v. Wood, 3 L. R. Ex. 257.
(*w*) Cross v. Barnes, 46 L. J. Q. B. D., 36 L. T. N. S. 693.
(*x*) Ex-parte Daglish, 8 L. R. Ch., 1,072; Hawtrey v. Butlin, 8 L. R. Q. B. 290; Ex-parte Barclay, 9 L. R. Ch. 609; Meux and Others v. Jacob, 7 L. R. H. of L. C. 481; Exp. Tweedie in re Trethowan, 5 L. R. Ch. D. 559; 46 L. J. Bank, 43 C. J. B.; Ex-parte Eslick in re Alexander, 4 L. R. Ch. Div. 503; 46 L. J. Bank, 30.
(*y*) Colgrave v. Dias Santos, 2 B. and C. 76.

(*To be continued*)

THE ÆSTHETICS OF DECORATION.

THE opening meeting of the twenty-second session of the Edinburgh Architectural Association was held in their rooms on Wednesday, the 12th inst. Mr. Thomas Bonnar, President, in the chair.

In the course of his inaugural address, the President remarked that at the present time there were few æsthetical principles more earnestly discussed, and brought more prominently before the public than those relating to the decorative arts. "No doubt," said Mr. Bonnar, "the higher branches of these arts have had their seasons of ebb and flow in public estimation. But even when fallen to their lowest ebb, there remained traces of a former power—the consequence of their relationship to, and sympathy with, the motives of human thought and action. But, Decorative Art—from its representation being materialistic in character—rendered its decadence less apparent, and from this cause it gradually ceased to obtain recognition as the medium of the expression of active social life and thought, or to be looked upon as a means of enhancing and bestowing refinement on the varying phases of the everyday life of the domestic circle.

"These functions it unquestionably accomplished previous to its decline: and it still continues to perform them in those countries where it continues to be cherished and esteemed. With us it may, without exaggeration, be said to have died out, as the experiences of the last fifty years graphically testify. Indeed, the larger portion of the productions of this period are barely creditable to a people with fewer pretensions to the high state of civilisation which we in this country lay claim to.

"If, for instance, we glance at the adaptations employed in the production of articles for utilitarian purposes, what do we find? Why, the forms which originally invested them with grace of outline and distinctiveness of character, which had distinguished them as they had been handed down from one generation to another, with that completeness which is invariably present in those works that have been made a speciality of craft, have become so distorted as to render them almost incapable of use for practical and impossible for ornamental purposes; that over-lavish employment of ornamentation which is the prevailing feature of deficient workmanship and general incompetence being painfully apparent.

"Need I specially allude, in illustration of this statement, to those articles which are so familiar to us all under the comprehensive title of 'Brummagem,' as being fair examples of the objects indicated. It is, however, somewhat consolatory to bear in mind that this term embraces the whole range of objects which are looked upon as shams, and are contemptuously referred to under this general phrase. This is undoubtedly gratifying, as evincing a movement in the right direction. Although, after all, it is only a very limited number who are capable of resisting that tawdry display of hideous form and imperfect workmanship which are to be witnessed in many of the productions that are even now being put forth, that have the additional objection of being defective in construction and entirely wanting in originality of design. For the chaste and real possess a modesty, an unobtrusiveness, which render their merits apparent only to those who can recognise the genuineness of purpose and sincerity of thought which are the invariable characteristics of the truly beautiful.

"In singling out this example of 'Brummagem,' I do so as it seems to me to illustrate pretty accurately the position of which the decorative art at present hold with the public. And it may, I think, with propriety be attributed to the late—and I trust returning—prosperity of the country, and consequent demand for display by the many who in the absorbing pursuit of wealth either neglected or lacked the opportunity of acquiring a knowledge or taste for such matters. Moreover, owing to the almost entire disregard of these studies by native artists, our manufacturers were driven to the necessity of invoking the assistance of foreign artists to meet the growing demand, thus tending to make matters, if possible, worse, by thoroughly denuding their productions of all national association and impress.

"Until quite recently in this city, and still to a large extent in the south, it has been and is received as a matter of course, that all the higher class of mural art can only be competently and efficiently executed by foreigners. It is with no intention of disparaging the ability of these men that I remark that, however clever and artistic their work may be, it can never be looked upon or received as acting in harmony with our native instincts, nor yet suitable and appropriate to the wants of our country. Their treatment, colouring even to the very details of their theory of ornamentation, acquired in their own schools of art, can never strike a truly responsive chord, but must always remain a thing apart and unsympathetic with our requirements and wishes.

"Unfortunately, this state of matters, as I have already stated, forms a serious, although not insurmountable barrier to rapid progress, in the various departments of national decorative art, as it places in our way the serious task of having first of all to unlearn a very great deal of what has hitherto been looked upon as strictly proper, and also making it necessary to create a confidence in the mind of that same public which hailed the stranger and his art with admiration, while strongly impressed with the idea that it was an impossibility for their own countrymen to compete with the remotest chance of success against the foreigner in this class of work.

"One of the causes which led to this neglect of decorative art was of somewhat singular origin when viewed from the standpoint of our Continental neighbours. It arose from the circumstance of there being very little encouragement held out to the student of ornamental art, to induce him to devote himself to its study and practice, and however eager and ardent his proclivities might be in that direction, this drawback exercised a disheartening and deterrent influence. There were indeed very few attractions or inducements to bind him to its steady and earnest pursuit. This clearly points to at least one of the sources to which may be traced the neglected position to which this art ultimately fell.

"It must be borne in mind that the presence of such an institution as the School of the Board of Manufactures, which was established for the promotion of the useful and decorative arts in the latter part of last century, had in a few cases been taken advantage of, in the spirit in which it was instituted. Instead of devoting attention to the study of the decorative principles taught, the students of this school applied their energies to the more attractive pursuit of pictorial art, and in many instances, doubtless, with great success, as the brilliant career of David Allan, William Allan, and Runciman conclusively testify.

"Although it must at the same time be remembered that the unsuccessful aspirants in this branch of art were in number legion. Had those unlucky enthusiasts only followed out the training bestowed by the decorative department of the school, and had been assured of obtaining public sympathy and encouragement, in all probability we would not now be regretting the presence of the many crudities and absurdities which daily produce unrest and disappointment to all lovers of the beautiful and true in decorative art.

"Having thus briefly alluded to the position maintained by the useful arts during the first half of the present century, and also endeavoured to indicate a few of the causes of their backward state, I shall now proceed, and, speaking in a more hopeful tone, I will attempt—I trust successfully—to show that the gulf which had so long existed, and kept apart the decorative arts from those of architecture, is now rapidly disappearing.

"When the latter art was in the zenith of its power, during the best periods of the Greek and Roman epochs, and also in later times in France, the decorative arts blended with it in congenial harmonious action for the perfect embodiment of the grand and beautiful. The examples of these periods being all more or less distinguished for the power and originality of conception and design, and vigour and grace of execution, thus strikingly exemplifying the influence which these arts exercise on one another, and the charming results they produce in combination, when controlled by cultured and true artistic instincts. As exhibiting the revival of this spirit, we may point to sculpture, and the place it now holds in connection with ornamental detail, as coming more under your immediate observation: it will be acknowledged beyond doubt that it begins to show a steady progress towards freedom in thought and execution, approaching in some degree the works of these earlier times, when the decorative arts were the intimate though humble handmaidens employed in the embellishment of those noble fabrics which are at once both the objects of our admiration and the sources of our embarrassment, as they reveal to us the triumphs achieved by independent thought when united in action, and directed towards the production of objects having for their aim the typical illustration of the highest form of ideal motives.

"Indeed, it may be truly said that this disregard to the independent study and practice of architecture in later times operated prejudicially on the minor arts, which together constituted the complete embodiment by which its growth could only be successfully nourished and maintained.

"As with the improvement apparent in the particular art referred to, namely, ornamental sculpture, so it is with mural decorative art, painted glass, ironwork, and carving; each of which begins to show in an unmistakable manner that the present revival contains all the essential evidence of being the result of earnest and genuine study, accompanied and intensified by the powerful adjunct enthusiasm, which was such a prominent feature in the early works.

"With all those aids at hand, undoubtedly the architect, as administrator, possesses very great influence in giving a true direction to any æsthetic movement. But after that is acknowledged, it is to the educated public that we must look to for aid in the promotion of art progress; their ideas being untrammelled by the operation of technical barriers, will assuredly give an impetus to those faculties in art which are comprehended within the familiar circles of home life. This will be found especially useful when employed in producing the picturesque effects so desirable in the treatment of interiors, which are so necessary in acting as a foil in lending value to the various cognate arts that are requisite in forming the complete and successful constituents of all that is essential to the perfection of domestic arrangements. These ends can only be accomplished by a careful and discerning study of the individual parts. I humbly submit that in this sense the subject of interior treatment has not received the amount of consideration and assistance from the architect which it deserves, but has been left very much to accident or to the caprice of those who have been delegated to the performance of this function.

In the majority of cases this work, being esteemed as one of a purely mechanical nature, has been hitherto in great part executed by individuals entirely untutored by either study or thought, and whose want of appreciation has naturally resulted in discordant and unsympathetic effects.

"It must be admitted that, practically, in the larger question of external architecture which has heretofore engaged so much of the architect's attention the general public have—at least, in a direct manner—very little to say in the matter, either in the way of acceptance or rejection of the design under consideration, all the triumph or 'otherwise' being generally appropriated as a personal matter and as the outcome of individual effort, the public merely having the privilege of expressing their approval or disapprobation, without in any sense influencing the final result.

"It is, however, otherwise when engaged in considering the merit of the practical agents of usefulness employed in our domestic arrangements.

"As I have already stated, the greater portion of these have been handed down to us in their primitive simplicity, having all the recommendation of fitness to their various functions attached to them. Hence arises the necessity of dealing with them in a discerning and judicious spirit, so as to render them, not only attractive, but also in subjective harmony to the higher state of refinement prevailing in society ; at the same time accomplishing those modifications without interfering with their original uses and purposes. In performing this successfully, while retaining the original beauty, lies the real basis of all genuine artistic design. For it can only possess one of two qualities. It must either be in perfect unison or in utter discord.

"The first having the chaste ornamentation as it were arising spontaneously from it and diffusing an atmosphere of elegance in accordance with its changed circumstances ; in the other case exhibiting excrescences miscalled ornament, to that extent that the usefulness of the article —if, indeed, it might be presumed to have any remaining—is utterly lost. And there is a total absence of the qualities that are especially welcome to those who have the gift of appreciating that subtile indescribable presence of the beautiful which always possesses the two main essentials, namely artisticness and skill.

"In what I have said I have attempted to show, although not so clearly, perhaps, as I could wish, that this knowledge of the beautiful is necessary to the true enjoyment of intellectual life. Its presence is always apparent where its influence is operative. We have ample evidence of this if we look around us, for we can witness how that it exercises in a high degree its power to enrich the thoughts and elevate the character of those nations and peoples who have lived under the charm of its benign sway. And the page of history tells us that when all other mediums of thought were restricted and fettered, that of art flourished in unrestrained and unbounded liberty of action and freedom of expression. Nor can we forget how, in its association with religious symbolism, its graphic power of illustrating the loftiest forms of sacred thoughts and aspirations, enabled it to express in far clearer and distincter terms the subjects it was designed to teach, than the limited forms of articulate language could even attempt to do. It was a means of conveying solace and comfort to all conditions of men in those bygone days. And it touched a chord in human nature which, responding to the call, animated man to adopt it as the sure and unchangeable exponent of the noblest sentiments which religion could inspire. This naturally suggests the question—Can such a consummation ever be the lot of mankind again? Or has the imaginative art any real existence among us? In answer to these queries surely it is not too much to maintain that man is still constituted very much the same as in times past.

"Although our proclivities may be characterised as having been anything or everything but artistic in these latter days, yet it must be granted that there has been growing up around us a spirit of inquiry, and a desire for more intimate relationship in connection with things artistic. So that we may with confidence indulge in the hope that the tiny spark of sympathy, if carefully tended, will ultimately kindle the great mass with the fire of enthusiasm, and its light, reflected by the traditions of past art, and by the works of the early masters who were its faithful and earnest exponents, will serve as a light and guide to those who are now anxiously engaged in rearing up a healthy and solid fabric on a sure and steadfast basis.

"It cannot be presuming too much to foretell that the imaginative type of art, from its present promising condition, will soon become a realisation; producing from its inexhaustible stores treasures of fancy and countless pleasurable ideas. For it must be remembered that, to be true, 'imaginative art' must not, and need not be, a prototype of the past. It will rather be of wider and more progressive aims, if, as we have already assumed, the mental constitution of mankind continues to be framed on the same model as it has been.

"Art, to be really representative, and to maintain its position as the medium of illustrating the emotional activity and intelligence of which it claims to be the reflection, should throw its influence in with the tendency of the age.

"This is what it has done, as we find recorded in the history of those periods which have shone most conspicuously on the great art epochs.

"Decorative art, in its association with national systems, has always proved to be a powerful auxiliary in the advancement of the particular theories of its patrons. The functions it performs being enhanced by its emotional characteristics, its power is consequently very considerable ; and from this springs its fitness of being readily engrafted on almost any form or state of society. And why should this most humanising of material agencies be ignored? It is impossible to do so. For whatever is in close sympathy and affinity with our higher nature is sure to become (although it may be unconsciously) assimilated with those loftier instincts. Then it will be found that real art, with its genuineness of purpose and purity of thought, will clearly and accurately define those subtile qualities underlying our nature. And if we lend our aid in the advancement of its true principles, decorative art will become an active, as it is qualified for being a responsible, agent in the direction of our everyday thoughts and aspirations, teaching its lessons with dignity and authority, and occupying a high place in the onward movement of civilisation and culture.

"In conclusion, I will merely observe that since it is obvious that we cannot overlook the importance of art sentiment, we are bound to encourage its progress, acknowledge its power, and draw from it a pleasure higher and purer than that of a mere sensation. By alluring us to the study of nature, it will quicken our faculty of distinguishing the beautiful, and enable us to understand that ætherial, subtile grandeur visible in the colours of a glorious sunset, which, although originating in matter that science analyses for our edification, nevertheless exercises an irresistible emotional power which, although conscious of its working, we are unable to express in language.

"It is evident from all this that the inherent perception of the beautiful is a strictly human faculty confined to no race in particular, but acting visibly on our minds as an incentive to study, and endeavour to comprehend the deeper and mysterious workings of nature, thus leaving us to a clearer understanding and higher sense of the purity of life itself.

"Trusting that what I have said will be accepted as an illustration of the similarity of study requisite for the acquisition of a correct knowledge of architecture, as well as for the practice of decorative arts, we can point to examples where men happily combining these two faculties, have created names known and honoured in the world of Art. As will readily be conceived, the practice in olden times of uniting both of those artistic functions was more noticeable from its absence than by its presence in the architect.

"Having now, in a somewhat imperfect manner, attempted to show how these innate powers in the artist of producing the beautiful, have a close affinity with each other, and in that relationship should be considered worthy of the acceptance of each other, I shall in this light view the motives which actuated you in electing me—although but a humble worker in the Mural Art—to this chair. And justly accept the act as indicating your concurrence in some of the theories I have endeavoured to elucidate."

Mr. Stokoe has been appointed surveyor for Maryport.

OUR WORK AS SEEN BY OURSELVES AND BY OTHERS*

THE many excellent addresses delivered here by my predecessors in the office of President have dealt at first hand, sometimes with the whole range of the work of architects and of the Association, sometimes with controversies about education, theory, and practice. The spirit of these precedents should, no doubt, be followed ; and perhaps no great blame would be deserved if we took them to authorise a momentary view about us, in order to see how we are, and how we would wish to be, treated by the world and by each other.

The virtues of the reverenced class of patrons and employers may shield from observation the weaknesses which they,—notwithstanding their privileges,—probably share with ordinary humanity; sometimes less of wisdom and knowledge appears in their estimates of men and things than might be looked for, all things considered. A working majority of members of the general public,— worthy but somewhat worried persons,—do their best to thrust the memory of professions in general, and of all that they do or attempt, into the limbo devoted to disagreeable necessities, till the time comes when there is need for aid, and the existence of some one who will give it may be remembered. By good luck the catalogue of our fellow-creatures is not exhausted when we have checked them off so far. There still remains a little band who have acquired a habit of thinking about and getting pleasure out of, old and new architecture, some of them taking the trouble to record their impressions in print, so that the world may read them. Of the formidable class who go that length, it may be somewhat venturesome to speak above a whisper. We know of old, however, that a glimpse of themselves, as seen by some one else, is not unwelcome to people in authority when their right to rule is not questioned, and no desire is shown to invade any of their provinces. A preface to an essay on criticism, or the preamble of a code of conduct, would be a much more serious task than the modest one we are now setting ourselves.

The excellent Mr. Joseph Gwilt, with a touch of delicate irony, set himself, in 1837, to writing "Elements of Architectural Criticism, for the use of Students, Amateurs, and Reviewers." Nowadays no one of the same eminence would be disposed to follow far in that vein. It is taken for granted that a good many critics know something of their subject before walking towards the judgment seat; arriving at concord is a longish process when one of the parties, and that one a judge, must have the language of the pleadings interpreted to him, and must be made to hear the facts, after having recorded his judgment. Gil Perez got, as it was, a little gentle raillery from the ungrateful Gil Blas for improving his own reading while teaching his pupil to spell; but his anti-type would fare much worse in these degenerate, irreverent days. Not even a strong tone of omniscience could carry it off in the face of haziness about first principles and technical phrases,—in language addressed to people penetrated also with honest self-admiration,—the proud sense of superiority of the white youngster worshipped by Uncle Tom's Chloe, for his ready power of distinguishing between Gs and Qs. With such people as lookers-on, re-discovering by accident a well-recognised truth, or adoring or setting fire once again to an exploded fallacy, may fail to cause thrills at all responsive to those which make glad the heart of the well-satisfied performer.

Wit which loses its point unless it is evident that somebody can be annoyed is not likely to become an extinct institution, and is never likely to afford a topic for very cheerful comment. There were, indeed, eccentric persons among us who looked on the odd articles in the *Quarterly Review* with satisfaction, because mild-mannered querulousness is put to silence in the shouting of a scold—because variety in men is very important—because whatever is destined for the advantage of posterity should be, if possible, put into a compendium, so as to save the future from loss and from useless moiling. Thus Mr. Walter Shandy felt the worth of the anathema read by Dr. Slop, "as an institute of swearing, in which, as he suspected, upon the decline of swearing Ernulphus had with great diligence collected together all the laws of it, lest, through the loss of time and the fatality of all things committed to oral tradition, they should be lost to the world for ever." The tracts by Sir Edmund Beckett have somewhat unfairly been classed with the collections of the Ernulphus of the *Review*, a painful evidence of want of thought; for few better specimens can be found of the minute manner, as distinguished from the sweeping, and of the avoidance of criticism, abuse, and calling names. Our Ernulphus meddled with all these. The success of a feast is, it is true, not always directly proportional to the number of things omitted from the *menu*; but many palates will put up with some amount of privation, if each little bit of detail, otherwise unpleasantly dry, is made to relish by being flavoured with a piquant sauce of naïve self-esteem and carping artfully blended, and a spice of calumny is sprinkled here and there.

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* An address delivered by the President of the Architectural Association, Mr. S. FLINT CLARKSON, at the opening of the Session on the 21st inst. (see p. 657.)

Notwithstanding some misuse of the word criticism, it is still associated instinctively with the idea of judging according to first principles, in order that the laws may suffer no hurt—not, however, stopping short at punishing evil-doers, but making it a duty to honour what is good by determining well the relation of things—to things of the same kind, and to things in general. If the whole of any matter is not examined on the surface and to the centre very little good can be done; and it is no valid excuse to quote—

> " So vast is art, so narrow human wit;
> Not only bounded to peculiar arts,
> But oft in those confined to single parts.
> Each might his several province well command,
> Would all but stoop to what they understand."

The official should not have appointed himself, if disposed to fight shy of the most important of his duties, and to justify his shirking by means of Mr. Pope's warrant—which does not give authority to those "who seek to give and merit fame" to attend only to what they can do easily to their own satisfaction. What Sir Joshua said, as to the genius of mechanical performance, might describe without altering a word the first duty of criticism, "to make the general effect and power of the whole take possession of the mind, and for a while suspend the consideration of subordinate and particular beauties or defects." An eye which can adjust its focus easily to whatever presents itself—which, therefore, can see blemishes if need be—is, of course, implied. While there is matter to remove from the wrong place an eye for defects will be specially useful to a scavenger; but the temper of mind which results in a preference for negations must fail in eliciting hearty liking for anything which has good or excellent qualities—in architecture for qualities like pure simplicity, refined elegance, grandeur, or solemnity. This is a different sort of thing altogether, and seems like having to do with substantial realities in a healthy atmosphere, instead of remaining, in order to give exercise to the eye for defects, among orts and refuse.

The truths about utility, the adaptation of buildings to their purposes, and to the special needs of the time, and other well-established commonplaces, will have to be repeated again and again, so that the weak may not be offended. We are not, however, called upon now for any protestations, and need not falter in reciting the belief that suitable expression is the quality in architecture which implies all others,—that it is, in fact, the ultimate aim in all good building, —that nothing can make up for the want of this, in the production of which general form, light and shadow, relation of solid and void, proportion, fitness, and a host of other attributes must be fused together. It is the glory of architecture that, in the highest efforts, by the masterful ordering of dead material in the hands of genius, impressions may be made which go beyond the eye, the mind—even the memory—and permanently affect the beholder. Unhappily, works of that rare genius—which sees things exactly as they are, and can carry into perfect execution whatever has been dreamed of as a whole—are all too few in architecture, as in literature, and in the other arts. It must still remain true that no building which is wanting in special expression can make good a claim to belong to architecture at all. If incapable of suggesting or sustaining some delicate emotion—by smiling grace, for instance, by severe grandeur, or by some other special quality in harmony with the destination of the building—it can only, at the best, be classed as good, common-sense building—and must be contented with possessing the same sort of merits as a serviceable shed, a well-cupboarded kitchen, or a soundly-put-together piece of walling. Members of liberal professions are charged with jealousy and other mean passions, because they ignore the larger quantity of other people's work, give scanty praise, and do not fail to point out weaknesses. There is a little understanding among them which outsiders do not always catch. If any besides the shots which are well on the target, and, for an odd time, the inexplicable misses of a capable man, must be spoken about, life would only be tolerable if the recreations were forgotten. The rule laid down by the cognoscente adviser of Mr. George Primrose would, if specially improved for the occasion, become "the criticism would have been better if the critic had taken more pains,"—which would be true at times of what architects say of each other,—as well as of what, by the revenges brought in by the whirligig of time, comes to be said by others about the brotherhood. Perhaps in the remote future all building will bear, at the least, the mark of what Mr. Garbett called "politeness," the evidence of thought and care in design, out of compliment to the beholder,—which is not incompatible with the most perfect simplicity of form and detail. But that must remain a sort of dream while we have so much extreme poverty; and while we supply homes and other buildings as well in so haphazard a fashion. When the works of incapacity or of routine—commonplace, dulness, positive ugliness, and the like—have been warned off, everything left will be the better for being carefully looked at and into, and the results chronicled; so that those who would otherwise be indifferent may be affected by sound opinions and breadth of view, and relieved from crotchets which are always trying to enter when there is vacancy. No profession has more cause than ours to welcome the help of intelligent amateurs,—indeed, of all who are capable of being touched by anything well done in the past and the present. Their existence in considerable numbers, and the consciousness that no labour and skill will pass unregarded by them at the last, is so much to the good; for, as far as pure architecture is concerned, the work has mostly to be done in silence, the course struck out without the chance of counsel, and followed near to the end before a voice from the outer world can be heard about it.

Mr. Whistler, in his cross-examination, and again in his little pamphlet, gave in his adhesion to the old heresy—that the only people who are entitled to be heard about an art are those actually practising it:—"Art, that for ages has hewn its own history in marble, and written its own comments on canvas, shall it suddenly stand still, and stammer, and wait for wisdom from the passer-by?—for guidance from the hand that holds neither brush nor chisel? Out upon the shallow conceit!" Actual experience is in truth an effective preparation for the thorough comprehension of anything out of the ordinary way; insight into method and perception of success in technical qualities may be almost instinctive, on the part of anyone who has attempted and succeeded in the same kind of task. The power of seeing things together, of permitting impressions to group themselves in the mind, so that none are unduly prominent and none are lost, is not a natural gift—at any rate, it requires long cultivation by actual contect with actual problems to develop it into any vigour. "The powers of invention and composition ought to be called out and put in action, or they will be torpid and lose their energy for want of exercise"; and the extent to which they must be exercised before they can move, without each movement involving painful effort, is probably not apprehended quite so clearly as it might be. Mr. Martin Chuzzlewit gave, to a design for a large grammar-school, the whole of the only week which he spent in the studio of his eminent master—apparently touching a T-square for the first time there. Following that excellent man's instructions, he "regulated his plan by the printed particulars." When he gave up the hope of erecting the public buildings at Eden, he came back, and found that a competition committee had set about erecting tho grammar-school after his design. Some competition committees, in 1879, might have thought the design showed undeveloped "powers of invention and composition."

The distinguished inventor of Mr. Phœbus deserves, and will keep, the credit of crystallising what was waiting in solution, ready for a master who could deal skilfully with chemicals. Balzac had taken some pains beforehand; and—"you know what the critics are? The men who have failed in literature and art" is not badly represented by "enfin il passa critique, comme tous les impuissants qui mentent à leurs débuts." It is really Mr. Whistler over again, with the worst of the heresy left out, and a touch of agreeable satire—"which oft was thought, but ne'er so well expressed"—put in. With a little more pleasantness—and therefore with a good deal less point—the paraphrase would be —unless soured or rendered touchy in the process, the abandonment by accident or inclination of actual practice is not a bad preliminary step for a critic to take. The secrets of the prison-house have been obtained, never to be forgotten; and, in the course of studies pursued at leisure, there will probably be joined, to acute perception of the right about details, a power of casting a wide as well as an intense glance—which is not unfrequently denied to the man whose nose has been kept too close to the grindstone. But the processes need not be scanned too closely, so long as the results are all that can be wished. When insight and knowledge have been obtained—the audience is close at hand, and ready to recognise all the value of, for instance, the acute and cultivated intelligence and the wide range of view, to which Mr. Fergusson has accustomed us, which have made him honoured in his profession, not least by the younger members of it—the respect thorough and sincere—although his reserved and virile tone does not call for, or permit, the personal interest which the other great critic of our time excites without effort, in all who come under the spell of his influence. The incessant labour, which is gone through with a cheerful will in actual practice, takes a fresh aspect under the magic of Ruskin's power,—not merely to reach intelligence and judgment, but to affect the bias of the will. The ear does not readily lose the echoes of that language which has extended the resources of our tongue, and it is impossible not to continue to feel some of the glow of that intense delight, in the works of nature and the best works of man, which not unfrequently makes the words themselves,—the fitting vesture of thoughts that burn,—seem actually aflame.

When what the world outside thinks, or should think, about our work has been passed by—what we think about each other comes straight in the way. It is felt at once that some parts of legitimate dramas are more fit for being merely mentioned, than for being performed *coram populo*. If some tyrannical influence allowed no option about discussing everything connected with this subject, one would be perforce condemned to emulate those public advisers who deem clever steering clear of difficulties their best title to honour. The reasons why our Association exists, and its scope, and the way in which the interest of the profession are bound up with the Association's existence and success, will be a sufficient theme. In several other large towns the example set in London has been followed, and societies have been formed in which, as with us, people who are engaged in the practical work of architecture may meet on the common ground of membership. Some recent changes—in procedure rather than in principle—will aid our members in declining to nominate anybody for membership who is only accidentally or temporarily connected with architectural work; everybody else will find when he joins us that any service he can render will meet with ready appreciation. It is not to be expected—and perhaps not to be wished—that any very large number of the elder members of the profession should enter our ranks; to retain those who have been with us for years as long as possible is quite another thing; at least, I am anxious to interpret in that way the fact that you have, in so kind a way, chosen me as your president, although a good part of a generation has gone by since I first joined the Association. The main work usually falls to the share of men who have not long reached, or who are approaching, the time when they will tempt fortune in independent practice, and of those who are fitting themselves for positions of confidence under the direction of others. The founders and builders up of the Association have recognised the position of, and striven and managed to bring about the fusion of classes,—the non-existence of cliques within the body; a most desirable thing, and now secured, almost without being thought about, by the system of nomination for membership, by giving to all members an equal chance of taking a share of the government of the Association, by making it the duty of everybody to join the classes ordinarily established, and to bear a part in the studies in them, or when desirable to band together some number of members for special studies. That kind of mutual regard which is rarely contracted—especially among shy and reserved people—except after a good deal of contact, may be looked for in the result.

It was felt to be impossible to fall in with the kindly-meant suggestions, made unofficially by some members of the Institute a year or two ago, that there should be an intimate alliance between the Institute and the Association. As far as the future can be forecast no such alliance can be looked for; at any rate, there will probably be no movement towards it from the Association, not because collision or bad management need be feared, but the essential feature of the Association is its self-governing character—the good plenty of members always ready to undertake and to keep persistently at whatever is really wanted. If any, even the slightest, screens should, of course in kindness, be erected, the body would be deprived of some of those bracing influences which keep up the vigour, at the same time that they menace the life, of such an association. Of course there are plenty of dangers of all sorts; you know most of them so well that you do not require to be told of them again. There is, for instance, the impression, in the minds of shrewd men of business, that too much intimacy among those engaged in different offices has its drawbacks. The intermixture of architects in practice and nearly ready to practise—all having a strong interest in promoting a feeling of honour in this as in other respects, if only because they would suffer themselves if it were wanting—is one of the happy results of our judicious constitution. All have need to show that service need not be the less loyal because it is more intelligent. Some honest desire for honest praise and recognition is, as we have been saying before, no unhealthy sign; but if the recognition does not come, as it should, it is as well to have the courage to get on fairly well without it. There are worse things in the world, most of us feel, than failing to obtain public notice; at any rate, when the conditions of the service are that no share of the risks and of the honours snall be borne. But if this strain were continued it might sound like giving ourselves praise. Happily, one of the greatest of the living writers of England has furnished words of guidance and consolation stronger, you will believe, than any I dare have ventured to write down, except as a quotation:—"The growing good of the world is partly dependent on unhistoric acts; and that things are not so ill with you and me as they might have been, is half-owing to the number who lived faithfully a hidden life and rest in unvisited graves."

THE TESTING OF PIPES AND PIPE-JOINTS.*

MR. MALCOLM McCULLOCH PATERSON, C.E., has written a useful treatise on the above subject, in which he draws attention to certain facts in the economical management of water-works which have come within his experience. Every hydraulic engineer knows the difficulty of insuring good workmanship in cast-iron pipes, and the evidence Mr. Paterson cites on this point is conclusive. Mr. Deacon, in his paper on "The Systems of Constant and Intermittent Supply and Prevention of Waste," says, "Out of every 100 gallons of water passing into a service main during twenty-four hours, it is not unusual for 35 gallons to be lost by continuous or hidden waste and 35 gallons by discontinuous or superficial waste, while only 30 gallons are drawn off for use." He also alludes to the liability of water-pipes, during intermittent service, to draw sewer-gas by direct communication with the sewers. Mr. Rawlinson has corroborated, from his experience, the constant leakage from hydrants and valves, and justly infers if this leakage occurs at the surface of a few streets, that the subsoil of a greater part of London must be saturated. In Liverpool the largest part of the reduction in waste of water has been due to repairs of hidden defects in pipes under ground. The author describes the Ossett water works, the scheme for which he prepared and carried out. The pipe conduit is of cast-iron pipes, 10in. in diameter, and over three miles in length, with a fall of 56ft. from the cistern of the Staincliffe tank to the top of the Gawthorpe tank; the level of the former being 484ft., and that of the latter being 428ft. O.D., the average fall, therefore, is about 18ft. per mile. The ground is very undulating along the line of conduit, and there is a considerable dip in one part, causing extra pressure. The pipes are described as the common spigot-and-socket kind, the socket being widened at the bottom ⅛in. to make a wedge joint and prevent the lead being blown. The maximum working pressure is 360ft., or 156lb. per square inch, and all pipes carrying a pressure above 200lb. are ⅝in. in thickness, the remainder being 9-16in. Sluice valves are provided at intervals, and air valves at every important upward bend. The covered service tank is minutely described and illustrated by drawings. It is situated at Gawthorpe, two miles from Ossett, it being the highest land, and the soil, a strong puddling clay, with stiff shale below, is well suited. The size of tank is 108ft. by 100ft. and 15ft. deep, its net capacity 1,000,000 gallons. The floor is of Portland-cement concrete, 16in. thick, rendered with ½in. of cement mortar; the inner retaining walls are of block masonry, partly of Bramley Fall grit and partly of Dewsbury sandstone, with rubble backing 5½ft. thick at base 2½ft. at the top. The face is battered one-sixth, and is set in lias lime. To insure a tight foundation the concrete is carried under the walls with a 6in. recess, and under the puddle trench. The tank is covered by brick arches in eight rows, each arch having a rise of 2ft. They spring from ashlar skew-backs, and are supported by 63 cast-iron pillars, resting on ashlar foundations, and are connected by cast-iron girders of triangular section. The arching is covered with 4in. of cement concrete. Over every line of pillars the webs of the girders are pierced by holes, through which wrought-iron tie-rods, 1⅛in. square, pass. But we cannot go into further details here, and must refer the reader to Mr. Paterson's description.

The testing of the mains is one of the chief points of interest in the pamphlet before us, and at the instance of Major Tulloch, R.E., who presided at an inquiry for the purpose of obtaining borrowing powers, the desirability of testing by hydraulic pressure all mains in the open trenches, after being laid and jointed, was advocated. The apparatus for testing the pipes at Ossett consisted of a common hydraulic pump that could be wheeled in a barrow, a few feet of strong hose, and a blank flange for attachment to the socket of the last pipe in each length. From the analytical record of the tests given, we find that out of a large total of joints 3·14 per cent. failed, the proportion of failures fluctuating between none in the 7in. pipes and 4·46 per cent. in the 4in. pipes. No satisfactory reason, however, is assigned for this freedom from defective joints in the larger pipes. As regards the straight castings, the author observes of the number of failures among the 7in., 6in., 4in., and 3in. pipes, "a moment's examination will show that nearly *seven-eighths* of the failures occur at the socket, and take the form of bursting or splitting, and that only *one-fifteenth* occur in the body or barrel of the pipe." In this case also the largest number of failures occur in the smaller pipes. The author attributes the bursting to an inferior quality of iron, and also to a difference in the mode of casting. We give the author's conclusions: (1) That the usual mode of laying cast-iron socketted pipes without testing them after painting, and in the open trenches, does not give adequate security against leakage; (2) that by such testing the desired security may in most cases be obtained at no great inconvenience or cost; (3) that all pipes, special castings included, should if possible be tested before leaving the foundry; (4) that the value of the principle of casting pipes with sockets downwards is confirmed, although it affords no absolute security against defective sockets; (5) that systematic testing after jointing will tend to improve the quality of both castings and joints, the cost of each failure, thus largely increased, falling upon the contractor at fault; (6) that the public will be further secured against accidents to lines of conduits, with their attendant costs—loss of water, interruption of supply, and the indraw of gas or other foul air at leaky joints when the pipes chance to be empty. We heartily commend Mr. Patterson's treatise to the notice of all engineers, borough-surveyors, and local boards.

SUGGESTIONS FOR DEALING WITH THE SEWAGE OF LONDON.

UNDER the above title, Major-Gen. H. Y. D. Scott, C.B., F.R.S, read a paper before the Society of Arts on Wednesday evening. The controversy between the Metropolitan Board of Works and the Thams River Conservators was set forth at length, the allegations and theories of Sir J. W. Balzalgette being contrasted with those of Captain Calver, the author drawing the conclusion that "it is impossible to believe that the organic matter of the sewage will wholly lose either its tendency to deposit on the river-bed, or to putrefy when there, whatever changes may be made in the situation of the outfalls." Passing from the historical to the chemical phase of the question, it was stated that the liquid and richest portion of the sewage of the 3,500,000 souls in London who contribute to the contamination of the Thames, was, in the opinion of all chemists, after its admixture with water, irrecoverable, unless it could be utilised by irrigation; while the solid suspended matters, which all the Royal Commissions on sewage disposal had, one after the other, declared to be the most injurious part of sewage impurities, if they could be recovered and be made into portable manure would each year be worth more than a quarter of a million of money. He believed he could prove that it was possible to accomplish this object to a large extent, in spite of all that had been said and written concerning the worthlessness of sewage manures. He proposed to show that if the investigations and analyses of the most eminent living chemists were correct, it followed that sufficient value can be recovered from the suspended matters of metropolitan sewage, obtained by simple subsidence, and unmixed with bulky precipitating materials, to meet all the expenses of keeping such an offensive and injurious matter as solid sewage out of the Thames. The suspended matters consisted, first, of animal dejections and vegetable refuse, and second, of mud and sand scoured from the streets, a simply impoverishing constituent in manure. The results of the researches of Lehmann, Wolf, Röderer, and Eichhorn, of Professor Way's experiments at Rugby, of those by Hofman and Witt, on sewage, at Dorset-square, London, of those by Mr. Shepheard, at Dr. Frankland's laboratory at Ealing, were compared in tabular form, and it was stated as the mean result, that the chief fertilising elements in London sewage sludge would be rather under than overstated by the assumption that there was 1 of nitrogen to 20 of organic matter, and 1 of phosphoric acid to 25 of organic matter. As to potash, the only remaining valuable element found in sewage sludge, a mean ratio was 1 in 56 parts of organic matter. But the most variable and most worthless component of sludge was detritus, and this might be got rid of to a very large extent by the provision of subsidence reservoirs. He would give the sewage a further period of rest, in order that the suspended organic matter might separate from the liquid, and be made available for manurial purposes. The respective values of the several fertilising ingredients of the sludge, viz., the nitrogen, calcic phosphate, and potash, were examined in detail, with the aim of showing that there was a serious deficiency of soluble phosphates, without which plants could not thrive, or even live. Good manures were more valuable to the farmer than inferior ones at a cheaper cost price, because in either case the money paid for carting and spreading a given bulk or weight of manure was the same. It was consequently desirable to precipitate the soluble phosphate, and this he proposed to do by adding lime, and subsequently a solution of superphosphate, to the sludge. Even if the sales only covered the cost of manufacturing the manure, it would be inexcusable to continue to throw these organic solids, the most deleterious parts of the sludge, into the Thames. He would carry out the process as follows:—

The first operation, when the supernatant water was drawn off from the deposit (which would consist of about nine parts of liquid to one of solid), would be to add to the sludge about two-thirds per cent. of quicklime, slaked, and made into milk of lime. This would be effected by running the milk over it, and then stirring the compound, which would effectually deprive the sludge of noxious smell. The next step would be to mix with the limed sludge such a quantity of the prepared superphosphate as will nearly, but not quite, neutralise the lime previously added. The mixture would now become surprisingly inodorous, considering its origin; the organic matter would also lose its slimy, glutinous nature, and, assisted by the precipitated phosphates and the crystalline sulphate of lime, intimately incorporated with it, the compound would drain and dry with comparative rapidity.

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* The Testing of Pipes and Pipe-Joints in Open Trenches. By Malcolm McCulloch Paterson, C.E. London: E. and F. N. Spon.

The total cost per ton of the treatment of the manure, including chemicals, would be almost £1 16s. 6d., and the manure would be cheap to farmers residing within 5 miles of the manufactory, at £3 10s. per ton. But what should be done with the detritus? It might be quickly dealt with and rendered perfectly clean by passing it through one of Fryer's destructors, heated with waste cinders, now a drug in the market, and most difficult to dispose of; or it might be used for reclaiming a portion of the marshes at the expense of pumping it to some little distance. Surely even this last plan would be preferable to putting it into the river and dredging it out again, and then having it still to dispose of. He would, therefore, urge on the Metropolitan Board of Works to adopt the recommendation of Sir Joseph Bazalgette, given twenty years ago, and make the defecation of the sewage perfect by precipitating it with milk of lime. This, by using 12 grains of lime per gallon would, with the carbonate of lime derived from the sewage water and other matters thrown down, occasion a total deposit of 22,000 tons per annum. This the author would deal with on one or other of the following methods:—Firstly. By adding the proper proportion of clay to be obtained from the river banks with the requsite amount of milk of lime, so as to enable the deposit to be burned into Portland cement, as is now done at Burnley under much less favourable conditions. Secondly. By re-burning the precipitate, and using it for a fresh portion of sewage, which operation might be repeated six times, after which the calcined deposit might be used for the manure process, or it might be sold for phosphatic agricultural lime. The phosphoric acid thus recovered would be worth upwards of £20,000 per annum. Thirdly. By selling the deposit as a top dressing for land, for which purpose farmers might be willing to give for it say 1s. per ton pumped into barges. The only point on which he saw any grounds for doubt was on the question of what proportion of the detritus it is practically possible to separate from the organic matters. To effect such a separation as he had assumed, would not be a difficult task for engineers, and the experiment could be made at a trifling expense. The cost of the tanks, if executed in concrete, would not probably exceed £100,000, and as the sale of the manure might be expected to realise £132,000 per annum, it would certainly be sufficient to cover the interest on this sum together with the expense of disposing of the sand.

An animated and protracted discussion on the paper was opened by Dr. Frankland, F.R.S., and among other authorities on the subject who spoke were Mr. Bramwell, F.R.S., Dr. Voelcker, F.R.S., Mr. R. Rawlinson C.B., Mr. Baldwin Latham, and Mr. Roger Field. A letter was also read by the secretary, Mr. H. Truman Wood, from Mr. J. J. Mechi, which excited much interest. It was as follows:—

"Tiptree-hall, Kelvedon, November 25, 1879. Dear Sir.—Not being able to be present, permit me to send a few words about sewage. The late Baron Liebig stated expressly that the addition of phosphates to town sewage would be advantageous, seeing that the bones of birds, fish, and animals were withdrawn and not consumed, and so did not enter the sewers. With regard to the general sewage question, I have personally arrived at the conclusion that the rain and land water should pass away separately from the sewage, and that the most advantageous mode of transmitting the latter, with the greatest effect and at the least cost, would be by the use of Mr. Isaac Shone's admirable system of pneumatic ejectors, thus insuring a rapid transit, regardless of ultimate fall or level. No doubt agriculture would quickly avail itself of the sewage when separated from the rainfall.—I have the honour to be your most obedient servant, J. J. Mechi."

ST. MARK'S, VENICE.

According to *La Roma Artistica* of Nov. 22, the Minister of Public Instruction has given orders to the Prefect of Venice to prevent the work of restoring the mosaic of the western façade of the Church of St. Mark from being proceeded with. From other sources we hear that when the Basilica passed, some months ago, from the jurisdiction of the Ministry of Grace and Justice to that of Public Instruction, the attention of the Minister was so urgently drawn to the vandalisms which had been committed on the two lateral façades, that in the month of May last he ordered that the Commission for the Preservation of Ancient Monuments should examine into the question, and decide what should be done in future for the preservation of the Basilica—not by the process of rebuilding, as had been done in the past, but by rational restorations, or rather repairs, where positively required, and that in the mean time no works were to be undertaken. This Commission is now sitting. When they have decided on the best course, their opinions must be pronounced upon by the Superior Council for Fine Arts, and then finally submitted to the judgment of the Minister.

There is, it would seem, hope for the future, but it would still seem impossible to repair the injury already done. Mr. G. E. Street, in a letter in last Friday's *Times*, says:—"Already St. Mark's has been for many years in the hands of restorers; and where they have been at work they have almost absolutely renewed the marble work, and have absolutely renewed the precious mosaics and the not less precious pavement. The exterior of the north wall of the nave was refaced some years ago. The old carved stones were cleaned up, and the marble slabs with which the wall was faced were all either replaced by new or cleaned and polished afresh. Every atom of the lovely colour given by centuries of exposure was carefully removed, and the consequence was that for years we artists have ceased to look at this north wall with any interest or admiration. In 1877, when I was last in Venice, the south side of the nave was being similarly treated, and, as a matter of course, the result is said on all hands to be the same in its disastrous character. At the same time I was shocked to see that the whole north aisle of the nave had been repaved with new material not after the old design in pattern, and laid with an exactness in every direction which contrasted most painfully to my eye with the old and beautiful surface of the floors of the rest of the church, softened in colour by time, exquisite in design, and in one particular—the undulating surface—though not quite unique, very nearly so, and not more rare than lovely. Some, indeed, may choose to maintain that this waving surface was only the result of accident, though it was strange that walls and piers should all be upright and without bulges or settlements when the pavement between them was so contorted. But, be this as it may, the result was beautiful; and no artist exists who will not grieve with me over the destruction of such an incident in this marvellous building. Unhappily, the work once begun, is going on. I hear that even now the pavement of the north transept is being taken up with a view to renewal, and it is almost too late for the most powerful protests to stay this mischief. No less sad is the fate of the mosaics on the walls and roofs, if we may judge of what will be done by what has lately happened. The Baptistry roof and part of its walls were covered with mosaics. The works in progress on the outside of this part of the church caused a settlement in one of the vaults. In 1877 I saw this shored up. In 1879 not a particle of the old mosaics have been left on the walls or vaults. The whole is new. The old material—imperishable in itself—was seen by several informants lying in a large heap of rubbish. Another bought for a few lire a large and perfect fragment of exquisite workmanship. The idea of those in charge of the work is evidently that a good copy of an old mosaic is quite as good as the old mosaic itself. This cannot be true. For, first, it is quite impossible to copy such work with more than the roughest approach to accuracy, and in the next place the modern mode of manipulation is so entirely unlike the old that even a rough likeness to the old work is not secured."

What is done *is* done however, and the protests of Mr. Morris and his friends, if they are to be of any practical use, must be confined to the future. Once, again, we cannot but think the tone of the memorial a mistake. Mr. J. P. Seddon's letter, which appears in another column, seems to us to indicate the character of remonstrance most likely to meet with success, and to effect the preservation of that which all agree in wishing to preserve.

The interest of the majority of Englishmen in St. Mark's seems to be confined to signing memorials, or such a work as that undertaken by Mr. Ruskin would have received more encouragement.

Writing of St. Mark's, he says: "I have got an absolutely faithful and able artist, trained by Mr. Burne Jones, to undertake the copying of the whole series of mosaics yet uninjured. He is doing this for love and mere journeyman's wages; but he has been six months at work alone, unable to employ assistants, and all that I have yet got for him by the eagerest appeals I could make at Venice and here is—some hundred and thirty pounds, and half of that from a single personal friend."

SCHOOLS OF ART.

Mansfield.—The annual prize and certificate distribution in connection with this school took place on Tuesday week, in the new building just erected for the purpose of a school of art at the rear of the Mechanics' Institute. The Rev. H. Cottingham, vicar of Heath, made the distribution, and delivered an address in which he advised the students not to copy nature too closely, for a picture in which every detail was portrayed would always look poor, but to follow the advice given by David Cox, not to follow nature too nearly. The report showed a slight decrease in numbers—67 against 70 in the previous year. Three third-grade prizes were obtained for works sent to South Kensington, besides a free studentship, three commendeds. Thirteen certificates were gained for drawing, and one Queen's prize and seven certificates in building construction. The local prizes offered by the committee were awarded by the headmaster of the Derby School of Art.

CHIPS.

Fenny Compton Church was reopened on Tuesday week. No substantial alteration has been made, but numerous improvements have been effected. The former pews have given place to suitable seats, and a larger altar has been provided. The architect was Mr. T. G. Jackson, of Devereux-chambers, Temple, London, and the builder, Mr. Attwood, of Brailes.

Messrs. Bemrose and Sons beg to announce the publication in March next of "The Chronicles of the Collegiate Church or Free Chapel of All Saints, Derby," by J. Charles Cox, author of "Notes on the Churches of Derbyshire," "How to Write the History of a Parish," &c., and W. H. St. John Hope.

All the principal books of the Manchester and Sheffield Railway Company were saved in two safes of Messrs. Chubb's make, in the fire that occurred on Monday morning at the Manchester Railway Station. They appear to have been subjected to great heat for several hours, but when opened all the papers, money, &c., inside were untouched.

A drinking-fountain erected at Wood-green as a memorial to the late Mrs. Smithies was publicly opened on Tuesday by the Baroness Burdett-Coutts. The memorial is an obelisk of grey Cornish granite, of which the apex is 32ft. above the ground, the shaft being formed of a single block of granite 21ft. high, said to be, next to Cleopatra's Needle on the Thames Embankment, the largest monolith in London. It was supplied from the quarries of Messrs. John Freeman and Sons, at Penrhyn, Cornwall, and erected for them by the Metropolitan Drinking Fountain Association. The cost of the structure is £800.

The Coach and Coach Harness Makers' Company, in continuation of their action in former years, offer prizes in money and medals for working drawings of carriages, cabs, &c., freehand drawings of ornaments, heraldic designs, and for papers on the technology of carriage-building, as well as species prizes for treatises on "Carriage trimming and leather work." The prizes in technology will be awarded by the examiner of the City and Guilds of London Institute, the other prizes by judges nominated by the court of the company. The competition is confined to clerks, foremen, workmen, or apprentices.

We are sorry to see that the ratepayers of the important metropolitan parish of Camberwell decided on Monday, by 1,306 votes to 679, against the adoption of the Free Libraries Act to the extent of a halfpenny rate.

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ILLUSTRATIONS.

GREENOCK MUNICIPAL BUILDINGS. — SAXON CHURCH AT ESCOMB. — DESIGNS FOR COFFEE TAVERN. — HOUSE AT WIMBLEDON PARK.—AVEBURY CHURCH, WILTS, DETAILS.

OUR LITHOGRAPHIC ILLUSTRATIONS.

GREENOCK MUNICIPAL BUILDING.

The second premium was awarded to the design illustrated by Mr. Charles Barry, the architectural adjudicator, out of 50 designs. The existing town-hall and council-chamber submitted occupy the centre of the ground on the north side; and in this design the police-offices are placed to the east, the collector's department to the west, and the principal municipal offices to the south of the existing building, this being the arrangement suggested in the instructions. The whole of the offices have internal communication with each other, and with the existing council-chamber, and new and commodious staircases are provided to the town-hall. In order to limit the expenditure to the stipulated sum of £80,000, as little alteration as possible is made to the present town-hall, the existing saloon and committee-rooms being retained. In the police department, the offices frequented by the public, as also the police muster-room and offices connected with it, are almost of necessity placed on the ground-floor, the police-court on the first-floor, and cells at the top of the building, lifts being provided to these latter, thus bringing them into communication with the private entrance and with the police-court; the captain's and record clerk's offices are placed in immediate communication with the police-court, and at the same time with the council-chamber and town clerk's offices. The magistrates would enter from the principal entrance in Hamilton-street. The principal entrance, which serves for both the town-hall and municipal offices, is emphasised by the clock-tower in Hamilton-street, the remainder of ground-floor towards that street being occupied by shops, according to the instructions. The first-floor of this block contains the committee-rooms, town clerk's offices, and provost's room, these latter being in immediate communication with the council-chamber already existing. The design was submitted under the motto "Omega," by Mr. Beatson Habershon, architect, of Roseneath, Ealing.

SAXON CHURCH AT ESCOMB.

This little church, which is near Bishop Auckland, though now exciting much interest in the diocese of Durham, was, until the last few months, almost unknown, even to local antiquaries, but into the merits of rival claimants to the honour of its "discovery,"—which has been the subject of much local newspaper controversy —we do not propose to enter. One of its chief features of interest is that it is almost entirely built of stones that have been previously used in Roman work,—the proximity of the Roman station of "Vinovium," now Binchester, about two miles off, indicating the source of supply,—and the walls are so solidly built and of such good stone that they are almost perfect. Another interesting feature is its symmetry, all the angles being exact right angles, the original side-windows being exactly opposite each other, and the same distance from the ends, and the original north door exactly in the middle, as shown in the plan, though by mistake out of its place in the north elevation. There are two lancet windows, inserted in the 13th century, on the south side, and windows of modern insertion on the east and west ends and on the south side. The porch is of more recent date than the church, and is not tied into it, but of what date it is impossible to say. It is built of rubble, but has large quoins of Roman stones. The doorway from it into the church is quite modern, having a wood lintel much bent, and no traces being discoverable of any arch or ancient jambs. The bell-gable and stepped tablings are also of uncertain date, but much more recent than the church. The basin of font, lately removed for safety to the vicarage garden, is evidently very ancient, probably of Saxon date, and originally square, the cants to form irregular octagon being evidently more recent. The sepulchral cross (now in the modern church about a mile off) is evidently of Saxon workmanship. There are several sculptured stones embedded in the walls which have great interest, and which we have also engraved. The one on the extreme left seems to represent a fish or serpent, with a crescent underneath, but whether of Roman or Saxon work is uncertain. Possibly it may have been an emblem belonging to some of the Roman soldiers from Persia or other serpent-worshipping country. The stone on the extreme right is now walled in, wrong way up, on the north side of the church, and the inscription was only made out when the measurements were being taken for these drawings. It is of great interest, as showing that the 6th legion, which had its head quarters at "Eboracum" (York) for 300 years, and which had detachments garrisoning many outlying stations, had, at some time, a garrison at "Vinovium." The church is now disused, but has never been desecrated, the churchyard, in which burials have been made probably for more than a thousand years, being carefully fenced and protected. The roof, which is of modern construction, though some of the timber seems to have been used previously, is much decayed, and many of the grey slates are displaced; the floor and all fittings are gone; but, with these exceptions, the building is as sound as when built, and a fund is being raised to repair it for use as a chapel-of-ease to the new parish church.

"BUILDING NEWS" DESIGNING CLUB.—A COFFEE-TAVERN.

"Edwin" is the author of the designs published to-day as the selected plan for a coffee-tavern, which was the first subject given at the commencement of the new series of our Designing Club. Our remarks upon this and the other designs have already been published, when it will be remembered we chose "Edwin's" design, not so much for its real merit, but because it was the best of those submitted. The author is evidently on the right road towards success, and there is much in his design which is suitable and good, especially in the front elevation, but, as we have already remarked, the side elevation is too cut-up and stilted in proportion, quite out of character with the style chosen, while the plan in many points is crude and awkward, evincing want of thought rather than want of skill.

HOUSE AT WIMBLEDON PARK.

The house is built on high ground, commanding fine views, especially from the garden front. The basement and ground-floor is built with thin red bricks as a facing, with a 3in. hollow space between it and the internal wall. The upper floors are timber, framed and covered with red tiles. The exposed framing is of oak and fir, coated with Stockholm tar, and rendered between with Portland cement. The roof is covered with Broseley tiles; the ground and first-floor is pugged and laid double. The principal staircase is constructed entirely of walnut, and polished. The doors, &c., are of picked pine, stained and polished. The house is warmed and ventilated on Drs. Drysdale and Hayward's system. Fresh air is admitted into a chamber, warmed when necessary, is conveyed by spacious tubes to gratings in the floors of the passages, and thence to rooms and staircases. Ventilating-flues from every room are collected in a chamber to the roof, and drawn down an extract shaft to the foot of kitchen chimney, which acts as the exhaust power to draw the vitiated air from all rooms and passages, and causes a continuous current, and secures an imperceptible and perfect ventilation, whereby the house is cool in summer and warm in winter. The plan of house, as shown, is arranged for two members of the same family, but is constructed so that it can form one house when desired. The small dining and drawing-room being convertible into large dining-room, and the passage being continued past principal staircase, the secondary staircase would become the servants'. The whole of the works, consisting of house, stables, and lodge, were executed by Messrs. C. Aldin and Son, contractors, of South Kensington, under the direction and from the designs of Mr. Thomas W. Cutler, 5, Queen-square, W.C.

AVEBURY CHURCH, WILTS.

The drawing we give this day represents the front of the old rood-loft, which has been carefully preserved by being fixed to the east wall of the nave over the chancel-arch. Many fragments of the rood-screen exist, and have been used in the construction of galleries and seats. These have been carefully collected, and the rector, the Rev. B. King, hopes hereafter to reinstate the whole to the ancient design. The original gilding and colours are well preserved. Restorations are now in the course of being executed in the church by Mr. Denner, builder, of Highworth, under the direction of Mr. Withers.

CHIPS.

New banking premises and shops are about to be erected at Bethesda, near Bangor, from the plans and designs of Mr. Richard Davies, of that city, for the National Provincial Bank of England.

The Wesleyan Chapel at Ambergate was re-opened on Sunday week, after being repewed. The work has been carried out under contract by Mr. Glossop, of the same town.

Mr. John Chapple, clerk of works at the Abbey, has been elected Mayor of St. Alban's for the present year.

The Holywell Local Board decided on Saturday week to take proceedings for erecting gas-works for the supply of their district, and instructed their surveyor, Mr. J. J. Williams, to prepare the plans for the same.

New banking premises are about to be erected at Hexham for the Cumberland Union Banking Company. The architect is Mr. Daniel Birkett, of Lowther-street, Carlisle.

A memorial window has been placed in the east wall of the chapel of St. Edmund the Martyr, Tewkesbury Abbey. The subjects are, "Christ Blessing Little Children," and "Christ the Good Shepherd." The work has been executed by Messrs. Heaton, Butler, and Bayne, of London.

Mr. John Francis, C.E., for many years engaged at the Penrhyn quarries, died suddenly at Portmadoc, on the 19th inst.

Operations have been commenced for getting in the foundations of the new market-hall and public offices at Ripley, Derbyshire. The architect is Mr. Tait, and the contractor Mr. Stirk, both of Leicester, and the clerk of works is Mr. Worley, of Ripley. The contract was taken at £8,138.

At the sale by auction of the first portion of the Alexandra Estate, on Wednesday, the 19th Nov., the whole of the 107 lots were sold at a total amout of £8,619, by Mr. Edw. E. Croucher.

Signor Luigi Gabet, one of the most distinguished of Italian architects, died last week, aged 56. The Senate Chamber, the Hall of the Provincial Council, and other important works, were designed by him.

Mr. C. J. Phipps, who furnished the plans for the reconstructed Plymouth Theatre, has been commissioned to provide the plans for a new theatre at Torquay.

A new church at Beckermont was consecrated by the Bishop of Carlisle on Tuesday week. Mr. J. Bintley, of Kendal, was the architect, and Mr. John Smith, of Egremont, was the contractor. The church is Gothic in style, seats 250 worshippers, and has cost about £2,300.

At Edmonton petty sessions on Monday, Charles Brown, of Upper Edmonton, was summoned for having built three houses on the Long Ledge Estate, Edmonton, in which the mortar used was not of the character and quality required by the by-laws of the Edmonton Local Board. The Bench, after hearing the evidence, were unanimously of opinion that the samples produced were not proper mortar, and inflicted a penalty of £5 for each of the three houses. Notice of appeal was given.

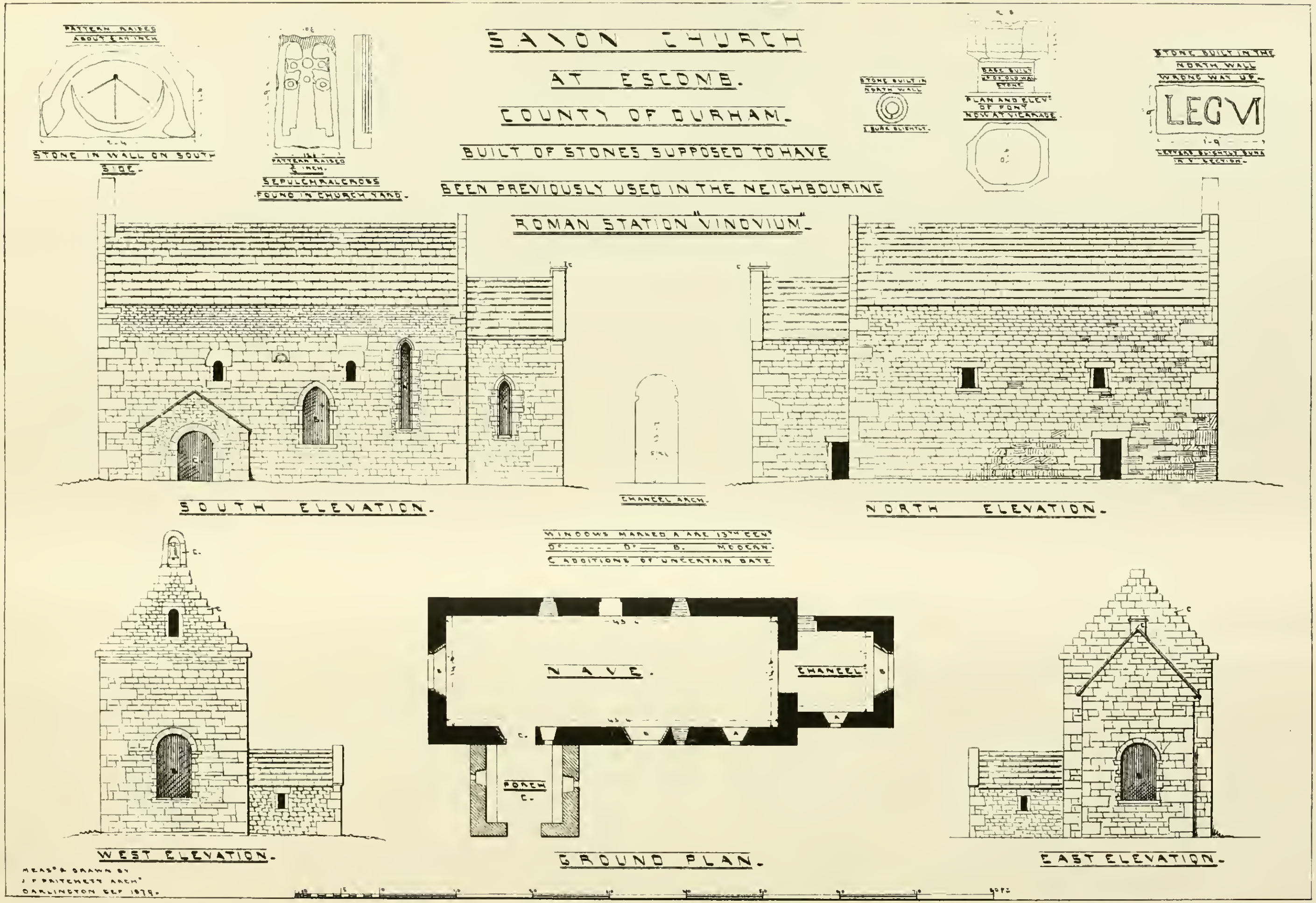
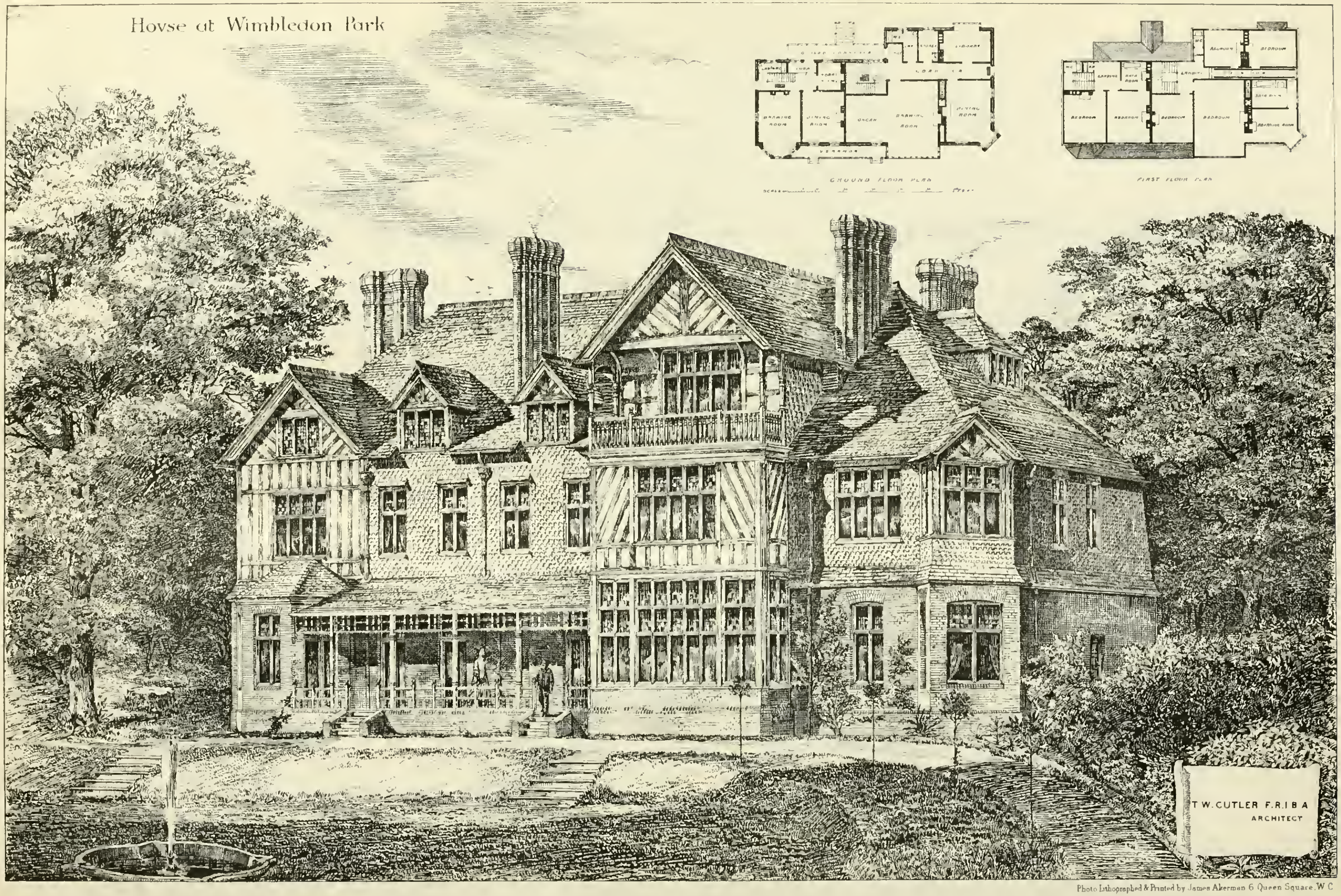

SAXON CHURCH
AT ESCOMB.
COUNTY OF DURHAM.
BUILT OF STONES SUPPOSED TO HAVE
BEEN PREVIOUSLY USED IN THE NEIGHBOURING
ROMAN STATION "VINOVIUM".
PATTERN RAISED ABOUT ½ AN INCH
2-4
STONE IN WALL ON SOUTH SIDE.
PATTERN RAISED ½ INCH.
SEPULCHRAL CROSS FOUND IN CHURCH YARD.
STONE BUILT IN NORTH WALL
1 SUNK SLIGHTLY.
BASE BUILT UP OF OLD WALL STONE
PLAN AND ELEVN OF FONT NOW AT VICARAGE.
STONE BUILT IN THE NORTH WALL WRONG WAY UP.
LEG VI
1-9
LETTERS SLIGHTLY SUNK IN V SECTION.
SOUTH ELEVATION.
CHANCEL ARCH.
NORTH ELEVATION.
WINDOWS MARKED A ARE 13TH CENY
Do. ---- Do. — B. MODERN.
C ADDITIONS OF UNCERTAIN DATE
WEST ELEVATION.
NAVE.
CHANCEL
PORCH C.
GROUND PLAN.
EAST ELEVATION.
A
B
C
50 FT.
MEASD & DRAWN BY
J. P. PRITCHETT ARCHT
DARLINGTON SEP 1879.

Photo Lithographed & Printed by James Akerman, 6 Queen Square W.C.

Hovse at Wimbledon Park



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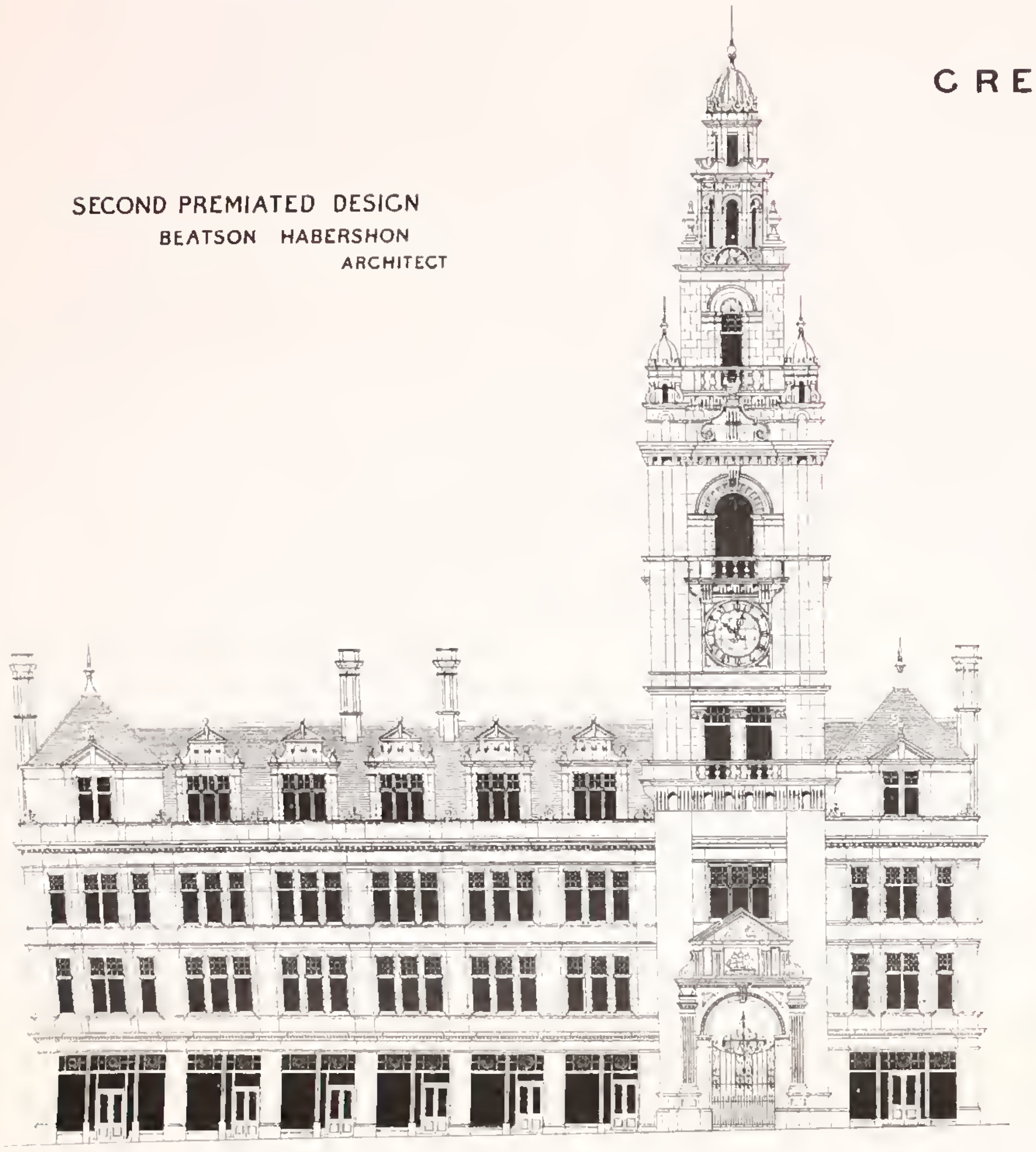
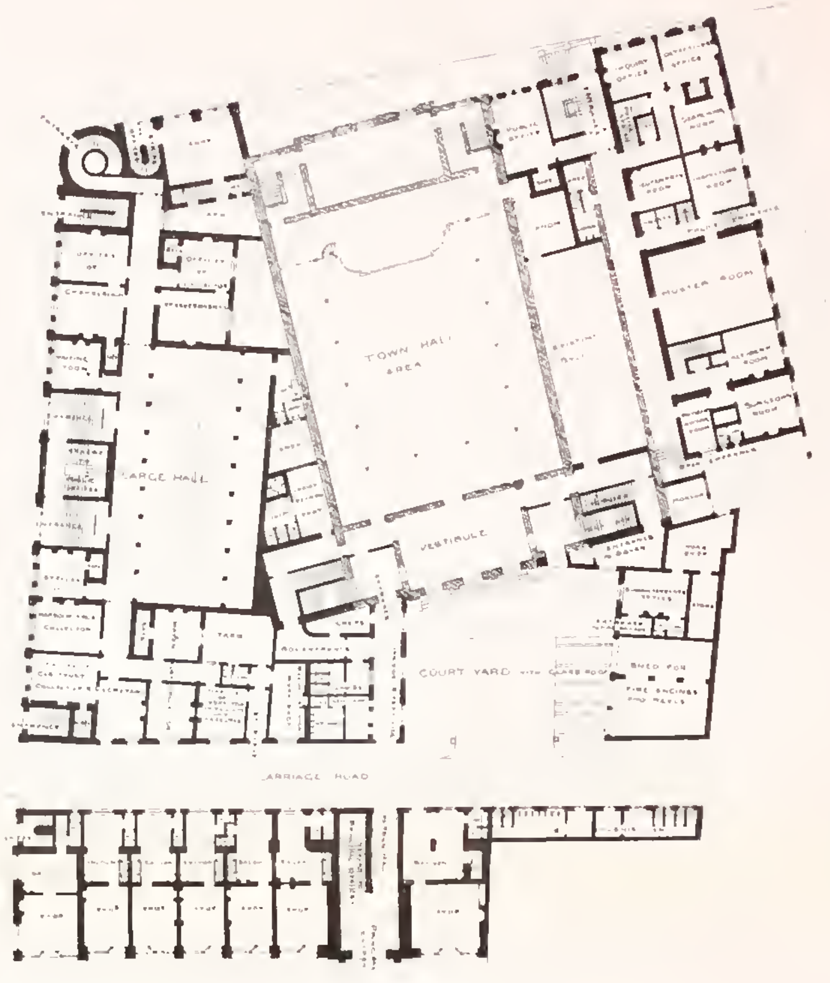
GREENOCK MUNICIPAL BUILDINGS

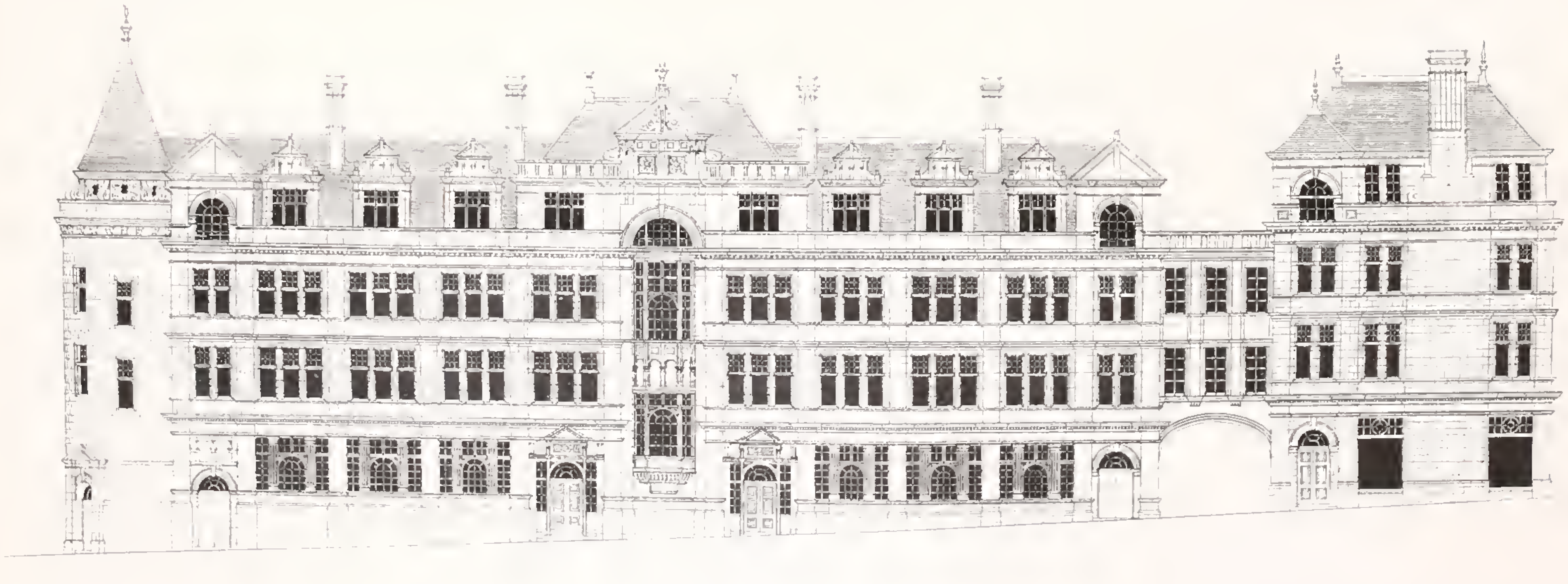
SECOND PREMIATED DESIGN
BEATSON HABERSHON
ARCHITECT



ELEVATION TO HAMILTON ST.



GROUND PLAN



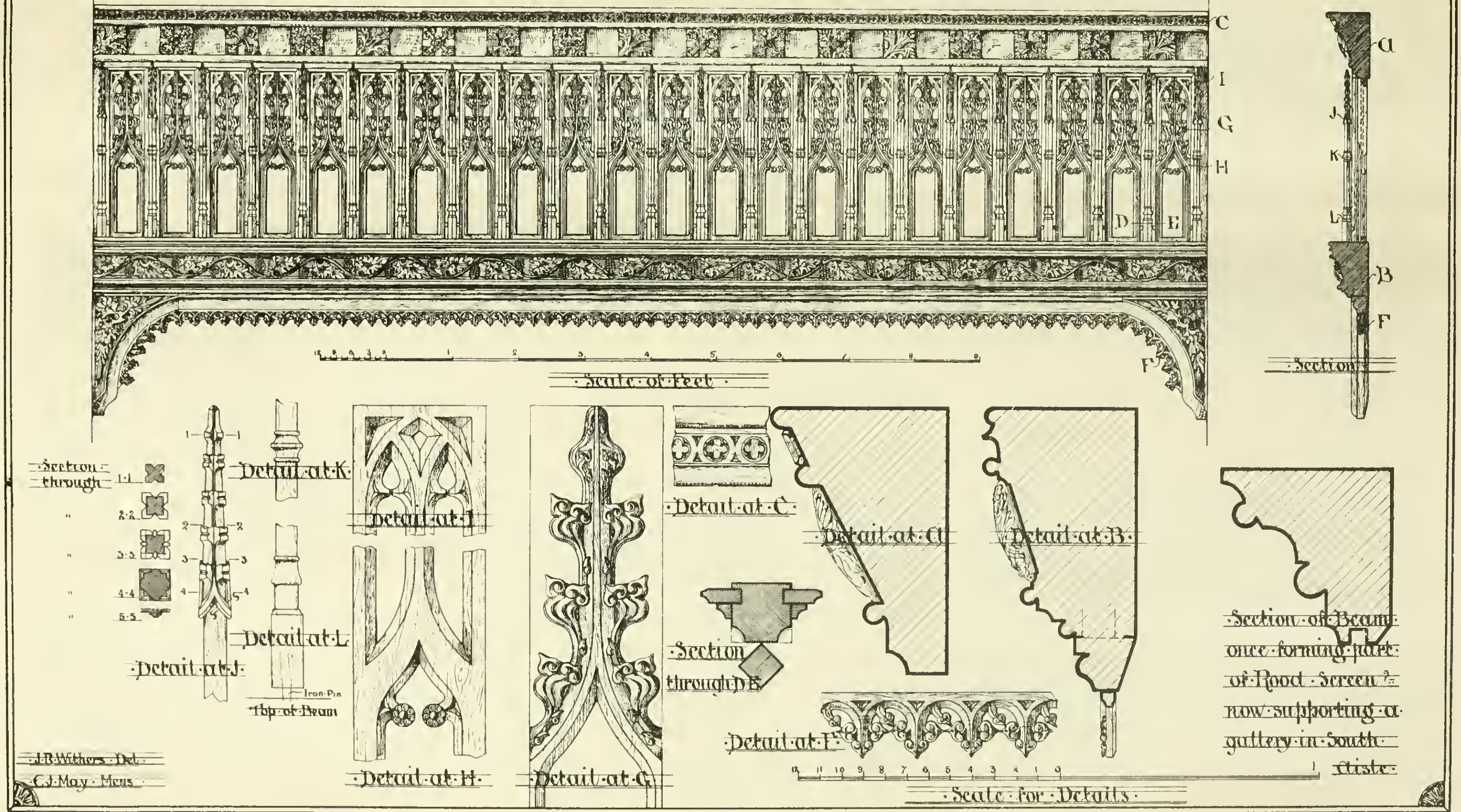
ELEVATION TO TAYLOR'S CLOSE

Scale of Feet to an Inch

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

·· Avebury · Church · Wiltshire ··

·· Remains · of · Ancient · Rood · Loft · and · Details ··



·J.B. Withers·Del.·

·C.J. May·Mens.·

Photo-Lithographed & Printed by James Akerman, 6, Queen Square W.C.

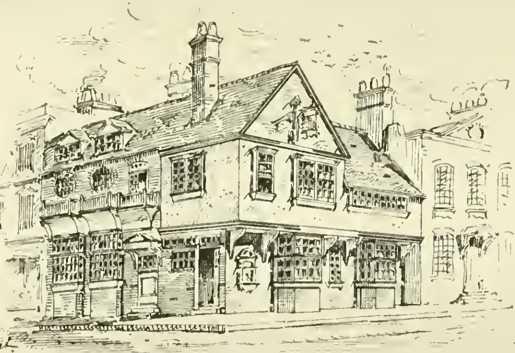
SELECTED DESIGN

Building News Designing Club

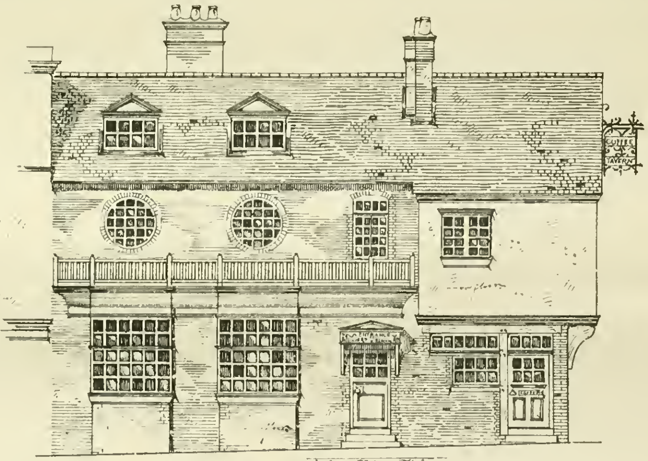
Coffee Tavern with Billiard Rm and Reading Rm attached

"Edwin"

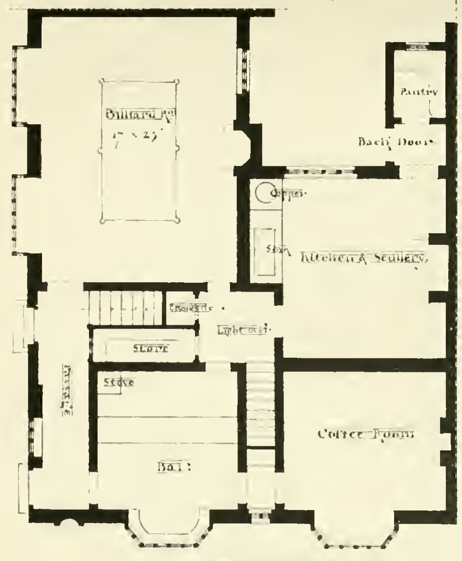
Scale of feet



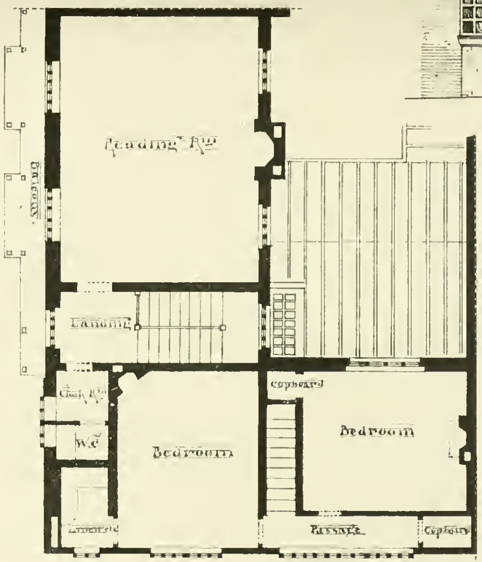
Sketch



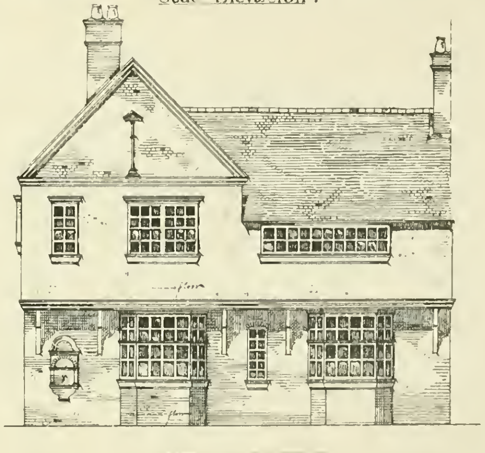
Side Elevation.



Ground Plan.



1st Floor Plan.



Front Elevation

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C

OLD ST. PAUL'S

FORMED the subject of an address by Mr. Edmund B. Ferrey, F.R.I.B.A., to the members of St. Paul's Ecclesiological Society, delivered at St. Paul's Chapterhouse on Wednesday evening under the chairmanship of Mr. Joseph Clarke, F.S.A. Our knowledge of how the old cathedral appeared was, the lecturer said, derived partly from contemporary manuscripts and books, the leading authority being Dugdale, but chiefly from drawings and engravings, by far the most complete and satisfactory being the views engraved by Hollar about 1657, very shortly before the destruction of the edifice. True, Hollar had no knowledge of Gothic detail and altogether failed to grasp its meaning, as could be seen from the plates hung on the walls of the room, but he pourtrayed to the best of his power what he saw, and, notwithstanding the many discrepancies of scale and parts, it was possible to realise the building from his drawings, and Hollar was to mediæval architecture in the 17th century what Britton, Carter and Pugin were, to its revival in modern times. One Van der Wyngarde's drawings, made in the 16th century, were preserved in the Pepysian collection, and there were also drawings and reports by Inigo Jones and Wren, but Hollar remained the most reliable. The author referred to the restored ground plan to ⅛th scale hung on the wall, which he made in 1868 as an Institute drawing, and which the Dean and Chapter had accepted. This and other sections and elevations had been reproduced on a reduced scale in Mr. Longman's "Three Cathedrals of St. Paul's."*

The connection of the history of the edifice with its architecture was so interesting that he should treat of both together, premising that the cathedral was never, like Westminster and most of our great minsters, a monastic institution—it was throughout its history served by secular priests, who took the name of canons. Until the 7th century the site was occupied by a temple of Diana, but in 603 Bishop Melitus founded a church on the site, of which nothing was known but that it or its successor was destroyed by fire in the time of William the Conqueror. In 1083 a most magnificent structure, with a large vault, was commenced on the site by Maurice, Bishop of London. Old St. Paul's might be compared with the contemporary cathedrals of Ely, Peterborough, and Norwich, all simple cruciform structures, with Early Norman naves, each flanked by a single aisle both north and south, and originally covered in with flat boarded ceilings; the choirs of all four were probably apsidal, but were removed at a later period. The revaulting of St. Paul's nave was commenced about 1100 by Bishop Belmeis, and was probably of wood, as was then common—a mode followed the other day by Sir Gilbert Scott at Chester. In 1136 the cathedral was greatly damaged by fire, and again in 1221. These injuries were repaired and the transepts carried on, and in 1236-40 Bishop Niger, a great benefactor to the building, commenced the choir, which, however, was not the one illustrated by Hollar, so completely was it recast in the 14th century. About 1250 the beautiful flying buttresses were added, and the cloister laid out. The transepts were recased, and had the unusual feature of both east and west aisles. The central lantern, the finest feature of the cathedral, was added to, and at length capped by a lead-covered spire of great height. The measurements varied greatly, the lowest being that of Wren, who calculated it to be 50ft. higher than that of Salisbury. Bishop Maurice's great undercroft seems never to have been destroyed, and consequently on leaving the long nave of a dozen bays there was an ascent of 12 steps to the choir. In 1256 the cathedral was enlarged by throwing into it the church of St. Faith, which had stood above ground, and for which part of the undercroft was substituted as the parish church—an arrangement followed by Wren. In 1332 the chapter-house was commenced in the middle of the cloisters, which occupied the angle between the nave and south transept. Mr. Penrose had had the site cleared, but all would agree with him that the masonry found *in situ* was not that of the 14th century, but of a later reconstruction. The cloisters were double-storied, as at one of the Leicestershire priories, at St. Stephen's, Westminster, and at Burgos, Spain; but the central position of the chapter-house seems to have been unique. It was an octagonal structure with great buttresses, and only 40ft. diameter, whereas those yet existing at Westminster and Lincoln, which were similar in plan, were nearly 60ft. diameter. In 1444 the lead-covered spire was struck by lightning and burnt, but was repaired 18 years afterwards; in 1561 the restored feature was totally destroyed by another fire, and although the roofs were repaired nothing was done to this feature. The old cathedral seems, in the 15th century, to have presented a sumptuous appearance, with its rich hangings, painted glass, images and monuments, although never equal in the last respect to Westminster, but all the decorations were swept away in the reign of Edward VI. In 1633 Inigo Jones commenced his celebrated porch, as the first of a series of alterations intended to completely Italianise the cathedral. The transepts were so altered, and then the nave, but the choir remained in all its Gothic beauty to the very last. In 1642 the old cross was pulled down, and after the Restoration the desecration of the building was carried to a scandalous pitch. From 1663 till the very moment of its total destruction, three years later, extensive repairs were carried out by Wren. Indeed, from the descriptions of the difficulties encountered in blowing up and pulling down the old walls after the Great Fire, it might be questioned whether, if such a calamity had occurred in these days of restoration, it would not have been comparatively easy to repair the damage; but, as they all knew, other counsels prevailed, and in 1672, after consideration of alternative designs, Wren's new cathedral was commenced.

And now, having outlined its history, he must allude to the group of buildings by which the old cathedral was enclosed, and which formed, indeed, the chief charm of a mediæval structure. Although in an early edition of "Stowe," Hollar referred to the "western towers," it was clear, from a consideration of the ground plan, the old drawings and the excavations on the site, that these adjuncts were never carried out. At the east end of the churchyard was a detached bell-tower, as at Chichester and (within modern times) at Salisbury, and this was capped by a leaded spire, and contained four immense bells. On the north side of choir was Paul's Cross, an open-air pulpit, from which many famous sermons were preached, and on north side of churchyard was the charnel-house, consisting of a vault with chapel above. This was first mentioned in Henry VI.'s time, and was pulled down in the time of Edward VI. To the north of the cathedral was a chantry, to which was attached a second cloister, wherein many monuments were displayed, and adorned with frescoes of the Dance of Death—a Campo-Santo in fact. A library was built by Bishop Sherrington over one part of the cloister. As Hollar unfortunately did not represent any of these buildings we could not see what they were like. Adjoining the south side of the west entrance to the cathedral was the church of St. Gregory.

And now, in conclusion, he must glance at the general appearance of the cathedral. As there were no western towers, the whole effect of the long choir, of the still longer nave, and of the greatly projecting transepts, with low aisles outside, was pyramidalised to the eye by the beautiful central lantern and the glorious spire above the great square tower which rose from between the roofs and flying buttresses. The nave of twelve bays, with its pinnacles and buttresses, must have been very fine indeed in its extent and proportions, both without and within. The plain Norman arcades, separated by a span of 38ft., and the vaulted roof, led on to the more ornamental transepts, and these prepared the eye for the rich choir. It was probable that the east aisles of the transepts were chapels, and the western ones vestries. Between the buttresses, though, were chapels, and at the west end of nave the consistory court was to south of entrance, as at present. In this nave was a rich altar tomb to Bishop Kemp, between the second and third columns of north arcade, and in the eastern bay on south side, was a monument to Sir Thomas Beauchamp. The total number of monuments was, however, very small for a cathedral. The whole length of the cathedral was variously stated but appears to have been about 596ft. Proceeding under the lantern eastward, the limb was divided into choir proper of four narrow bays and a presbytery of three bays more, the other five bays forming a Lady Chapel. The tracery of the windows in the constructural choir was of Decorated character of at least three or four patterns. In the north wall of presbytery was a series of tombs of Saxon kings, and just to the north of altar was the monument to John de Gaunt. In the north wall were the treasuries, and there were many little chapels in the external walls, supported by arched bridges thrown across the window heads of the undercroft. The whole cathedral was marked by a simplicity and proportion in the plan, and depended for its magnificent effect upon the multiplicity of parts, the variety of styles introduced, and the splendour of its altars, chapels, and fittings.

A vote of thanks to the lecturer was accorded on the motion of Mr. F. C. Penrose, who remarked that he had only one correction to make, namely that Mr. Ferrey in his plan had shown buttresses to the cloisters, whereas the remains proved that the wall was plain and abutted against the high mediæval houses by which the old cathedral was shut in on the south side.

ARCHITECTURAL ASSOCIATION.

THE opening meeting of the new session was held on Friday evening in the west gallery of 9, Conduit-street, W., which looked the better for the renovation and cleansing it has just undergone. The new President, Mr. S. Flint Clarkson, occupied the chair, and was well supported, the members present including some half-dozen of his predecessors in office. Some one-and-thirty nominations of candidates for membership having been read, the President moved the adoption of the annual report and balance-sheet (summarised in our last issue, on p. 611), which was agreed to *nem. con.* The library report was read by Mr. R. E. Pownall, who remarked that it was the last time on which he should address the meeting in that capacity. The average number of books exchanged per evening was over 45, just exceeding the average for last year, and larger than any preceding session. 1,491 books were renewed or exchanged by about 130 individual borrowers. The number of books received as donations was smaller even than last year. The report was adopted, and donations of drawings from the Institute, Mr. Florence, and Mr. Lascelles, were acknowledged by thanks, on the motion of Mr. Pratt, who for this session undertakes the duties of librarian. Mr. Eales, hon. secretary read reports of the classes. That for the Class of Design stated that the last session was the first of a new series, in which more time was allowed for preparing work, and alterations effected in the arrangements. The result had been satisfactory; the attendance was about double that of the preceding year, and 130 designs were submitted and discussed. The attendance at the Elementary Class of Design, the next report stated, had been maintained, and although the work done was hardly equal to that of previous years, the class appeared to have been useful to the younger members. Mr. J. Douglass Mathews expressed satisfaction at this revival of the designing classes, and at the useful work that was being effected by them. The report of the Architectural Science Class was the only one that spoke of decreased interest. In the Class of Construction and Practice it was stated that excellent work had continued to be done; the attendances had been good, but the number of papers contributed had been less than in the previous session; various works had been purchased with the balance in hand, as the nucleus of a class library. The Colour Decoration Class was also well sustained, the number of members, average attendances, and of sketches having been nearly doubled as compared with the previous year. The excursion report described the visit to Wells, of which at the time we published a journal, specially contributed by one of the members; the excursion was more largely attended than any of recent years, and passed off successfully. Mr. Eales having moved the adoption of these reports, Mr. Florence (ex-president) seconded it in a few words of commendation of the work accomplished last session, and the motion was unanimously agreed to. As to the Sharpe memorial, Mr. Quilter explained that the publication of the La Charente papers was now in progress, but he regretted that, owing to the limited response to the suggestion of a subscription list, the issue would be limited to 250 copies. All the proofs were on the stone, and the writing of the letterpress had been put into the hands of Mr. Penrose.

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* In the Building News for July 25, 1873, will be found photo-lithographic reproductions of Mr. Ferrey's plan, east, west, and south elevations, and sections through transepts; and in the issue of August 8, in the same year, Hollar's bird's-eye of Inigo Jones's porch for Old St. Paul's, and several illustrations of Wren's designs for the new edifice, all reproduced from Mr. Longman's "Three Cathedrals."

Mr. Clarkson then delivered his inaugural address, which will be found under the title of "Our Work as Seen by Ourselves and by Others," on page 640. After the delivery of the address,

Mr. Florence, in proposing a vote of thanks to the President, remarked that during its delivery he was for some time in doubt whether he deprecated criticism of architects' work or not, and he believed a conclusion was not arrived at. Speaking for himself, he thought criticism was of the greatest value to architects, who must be judged by their works. Free criticism was far better than apathy, and its increase showed the growth of public interest in the profession. He would, before sitting down, express the satisfaction he felt in seeing one who had so long been a hard-working member in the chair, and his belief that he would as president lead the Association into a calm sea and a prosperous harbour.

Mr. Stannus, in an amusing speech seconding the vote of thanks, eulogised the wide range of reading illustrated in the presidential address by quotations from such widely-divergent sources as Gil Blas and Gwilt, Whistler, Tennyson, and Goldsmith, Mrs. Stowe, Fergusson, and Sterne, Balzac and Dickens; and added that their estimate of Mr. Clarkson as the well-read member of the Association had been confirmed by all they had heard. As to Mr. Whistler's silly and contemptible pamphlet, he thought if its author had had the privilege of seeing Mr. Ruskin's marvellous reproductions of nature in his Alpine Range drawings at the Walkley Museum, he would not have ventured to charge him with inability to understand what constituted a painting. Mr. Ruskin was one of the great artists of this age, and one of the greatest critics of this or any other age.

Mr. Quilter said frank and friendly criticism was the very life and basis of every class in the Association, and the sterner criticism of the public was most beneficial to the profession.

Mr. Hilton Nash thought that if writers would try to ascertain the good points in designs and work, the profession would derive more advantage from their labours. It had been said with too much truth that critics were disappointed men.

Mr. Douglass Mathews regarded the presidential address of this session as unique in character. The fundamental principle of the Association was criticism, but he quite agreed with the suggestion that the criticism of the professional papers was of comparatively little value. If three or four journals described the same drawings they were all at variance with each other, and how could a man know which to regard as right? If this was the case with the professional papers, how could they depend on the criticism of those outside?

The vote of thanks having been passed amid prolonged applause, Mr. Clarkson responded, explaining that he had intended to say that criticism was a good thing so long as it was done by a competent and fair person. He considered that a critic ought first to deal with the chief features of a design, show if it exhibited purity of style and simplicity of construction, and then pass on to the minor details. As for Mr. Whistler, the only reason he had noticed him was because of the manner in which he had spoken of a great master of the English language.

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THE ARCHITECTURAL ASSOCIATION SKETCH-BOOK—NEW VOLUME.

THIS useful publication certainly deserves to be better known. Some few years ago Mr. W. Burges favourably reviewed, at considerable length, a few of the earlier numbers in our pages, and on such a subject he spoke with authority. It was a new thing then for students to interchange sketches, and Mr. Burges' own book of architectural measured drawings had not been published. The advantage of such publications must, of course, always be second to the measured studies of each student himself, simply because the chief value of all such sketches exists in the study and labour involved in making them. With this proviso all architectural students will do well to secure all the drawings, worthy of the name, of old work that they can, and probably to no better collection could they go than to the sketch-book published by the London Architectural Association. The subscription list is open to all architects, whether members of the Association or not. The first two numbers of the new volume in 1879 are now before us. Each contains six lithographic plates, 18½in. by 13½in., and these illustrate a selection of measured and perspective sketches of almost every kind of old work interesting to architects. For instance, here there are two sheets of old ironwork from South Kensington Museum, to 1½in. scale, and details full size drawn, by Thomas Garratt, in a thoroughly practical and artistic manner similar to those sketches often given of similar work by William Penstone, who in the numbers before us illustrates a beautiful little doorway, of Late character, from the organ-loft at the church of Nôtre Dame, Caudebec, from which same building are two perspective views, showing the singular vaulting of the Lady-chapel, and springing of the arches on the south side looking into the aisle of nave. These latter sketches are rather poor for Mr. Penstone. Mr. W. Talbot Brown has a good name as a sketcher, and we welcome him as a rather new contributor to this sketch-book, where he will be expected to do great things in the way of good detail. This time he has given a measured sheet, showing the arch over the tomb on the north side of the chancel of Higham Ferrars Church, Northants, with its colour decoration. This, however, suffers from the absence of colour on the drawing, though, perhaps, as a rule, chromo-lithographic illustrations of colour decoration are very misleading, so that Mr. Brown's copious notes, descriptive of the colouring at Higham Ferrers, may very well be taken as a good substitute. Mr. Batterbury is one of the oldest and most continuous of the A. A. sketch-book contributors, and though one of his faults is roughness, his drawings are usually well chosen and useful. In the present volume he takes us to the Church of St. Jean at Malines, where he sketches also a queer bit of stepped gable work by the side of a canal. The examples are more curious than good in design, and the same remark may apply to J. N.'s sketches of the Angel Inn, Grantham, though the drawing does not do justice to the work. The ceiling of staircase, with its pretty vaulting shaft from Kyme Tower, Lincolnshire, is much better. Mr. W. J. Millard bids fair to be a good sketcher, and often shows much feeling and spirit true to the school started by Mr. G. E. Street, and graced by such pupils as E. F. C. Clarke and the late Fred C. Deshon. Mr. Millard avoids the fussy wriggling of line peculiar to Mr. Street's pupils in his sketch of the Pilgrim's Chapel, Houghton-le-Dale, Norfolk, but he has given rather a wooden effect to the tracery. In perspectives of architectural work it must always be remembered that such drawings at best are but diagrams of technical detail, though on the other hand there can be no reason why general effect of light and shade should be treated as nought as some architects seem to think, and often among them do we find that spirited sketcher Mr. W. E. Eldon Deane. In the numbers before us he has taken much care in this respect, and furnishes a good general sketch of the Hotel de Ville, at Damme, near Bruges, and some exceedingly interesting bits of old houses from Abbeville, though we would remark that instead of space being made up with big lettering a few details to the street would have been a great improvement. The brick gable to the house at the bend of the street, with which it rakes on plan, is very curious. The quaint porch of good detail in wood to the church of Rocque, Normandy, by Mr. A. H. Tiltman, is a good drawing, but a small key perspective would have been of value in illustrating the points not quite clear in the elevation. As the sheet is marked as No. 1, the deficiency may yet be made good. We have only to add that, as a whole, these numbers show an improvement upon those recently published, and in no way suffer in comparison with the sketches published in the perhaps more enthusiastic days of the earlier contributions, among whom we may name Messrs. Tarver, E. C. Lee, G. Vialls, R. P. Spiers, and H. W. Lonsdale. While we recommend the sketch-book to new subscribers, it is to be first of all remarked that these are not so much needed, as more contributors who are ready to lithograph their sketches as soon as they have been passed by the Editors. At present a great number of drawings, we believe, have passed the ordeal referred to, but their authors fail to make good as quickly as might be wished their promise to lithograph their sketches for publication.

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FALL OF A GALLERY AT BATLEY.

THE recent fall of a gallery at the Batley Carr Skating Rink, which took place last Tuesday week, and caused the death of five men, came before the resumed coroner's inquest on Tuesday, when the jury, after consultation, returned the following verdict, "that the deceased came to their deaths through the breaking of the raking beams of the east gallery; that the said beams were not of sufficient strength to bear the weight consequent on the gallery being filled with an audience standing, and that great blame rests with the directors of the Dewsbury and Batley Skating Rink Company in not having satisfied themselves as to the bearing capabilities of the said gallery before letting it for the purpose of a public meeting. The jury also strongly recommend that all public buildings should be examined and certified by the borough surveyor previous to being let for public meetings." It appears that a political meeting was being held at the Skating Rink, Batley, and that the gallery was filled with a standing audience on the occasion. Several persons were also beneath the gallery, when a crack was heard, and, immediately, the end of the gallery dropped, and the whole structure fell, killing four of the audience, and injuring about sixteen others. From the evidence given by Mr. H. Holton, architect, of Dewsbury, it appears the raking-beams of the gallery were insufficient to carry the weight of the persons who occupied it. The breaking weight (in this case 450 cwt., distributed over its area,) could never have been properly calculated, if it had ever been done, for it is, of course, usual to allow only a certain portion of that weight, about one-fourth or one-fifth, to be placed upon any floor or similar structure. In this case the estimated breaking-weight was actually exceeded, for Mr. Holton's calculation shows that, if crowded, at 100lb. per foot, the weight must have been 600 cwt. The report shows the gallery was 47ft. 6in. long by 14ft. 2in. broad, and was supported on eight wooden pillars, four at the back 12in. square, and four in front—a pillar at each end, and two intermediate pillars 6in. square. The gallery floor rested on six raking-bearers, each 12in. deep by 4in. thick, the feet of these bearers being let into the front beam with a square tenon 3in. deep, 8in. long, and 4in. broad, and the upper ends let into the back beam. Two of these raking bearers were broken, and two others broken from the tenon. The timber itself was sound, and no flaws or cracks were found in the timbers. It is clear, from the architects' evidence, both of Mr. Holton, Mr. Anstock, and Mr. Firth, builder, that the area of gallery was greater than the bearers were sufficient to support, and the load put upon it was three times at least greater than it ought to have been. Mr. G. Mallinson, architect, of Harrogate, who designed the skating rink for the company, said no gallery had been designed or put in by him, but the building was made of sufficient strength to allow for the erection of one. We consequently find, therefore, that this defective gallery was a subsequent erection, and had never even been tested, but what is of more concern, had been designed and constructed by Mr. Matthew Wharton, a *woollen manufacturer*, to seat from 130 to 150 persons in chairs; and, in answer to the foreman of the jury, the witness said, "He did not think that he ever told anyone that it would not be safe to allow more than 150 people in the gallery. He himself was the architect of the galleries, but when they were put up, he engaged Mr. Spencer to examine them. He did not think the plans were ever passed by the authorities." Such, then, is the upshot of this lamentable affair. A woollen draper is allowed to put up a gallery in a public building intended for public gatherings; it is only destined to seat a few people in chairs, but is allowed to be crowded beyond its bearing capabilities at a public meeting. It falls, 5 persons are killed, and 16 injured, and we naturally ask, who is responsible? The jury returns a verdict that the gallery was woefully deficient for a standing audience, and censures the director, and we hear no more of the matter; those who dispensed with professional aid for mercenary considerations are let off scot-free. We can only congratulate Mr. Mallinson and the profession that the defective gallery was not the work of an architect, but a woollen draper who assumed the capacity, and that the work was never so much as challenged by any local authority. We have heard of drapers becoming architects, but then they have usually employed architects to assist them; in this case no one seems to have even looked at the structure, or passed an opinion on its safety for crowded assemblies.

COMPETITIONS.

Hull Asylum Competition.—The Asylum Committee of the Hull Corporation met on Monday, when the town clerk reported that the Justices had come to a resolution that the present was an inopportune time for the disposal of the land adjoining the old asylum, but they would be glad to consider any plan suggested to them by the Corporation. The borough engineer was requested to prepare a plan which he could recommend as the best way of laying out and disposing of the Corporation land. The Local Government Board had requested, in regard to the loan for the purchase of the land for a new asylum, that a copy of the consent of the Lunacy Commissioners to the building of the asylum and other documents in reference to the matter be forwarded. The Lunacy Commissioners had resolved to send Mr. Hartley, the county engineer for the Wakefield district of the West Riding, to examine the plans for the new asylum and report thereon.

Putney Baptist Chapel.—Thirty-three designs were submitted for the above building, and the committee have selected for the first premium the design by Mr. John Johnson, 6, Queen Victoria-street, Mansion House, E.C.; for second premium the design by Messrs. Bromilow and Cheers, Liverpool; and for the third premium the design by Mr. Jas. Hicks, Bristol. The approximate cost of the building is £3,500.

The new South Devon Hospital.—The committee of the South Devon and East Cornwall Hospital have at length been placed in possession of the name of the firm of architects to whom they are indebted for the design which will be in the main carried out in the new Hospital intended to be erected at Plymouth. In the conclusion they have arrived at, the committee have followed the advice of Mr. T. H. Wyatt. The course originally resolved on was in some respects novel. The plan of the committee was to invite nine architects to send in plans. Of the architects so selected five are gentlemen practising in the Three Towns, and the others are resident in the metropolis. A premium of £150 was offered, not to be given to the successful competitor, as is usually the case, but to be divided equally among those who were unsuccessful, the return for the premiated design being the execution of the work. On these terms, and in accordance with specifications, the clearness of which is shown by the comparative similarity of the various plans, seven architects sent in designs, which have been on view this week. The committee submitted the designs, marked with mottoes only, to their consulting architect, and Mr. Wyatt's verdict was that, with certain modifications in detail which he would suggest, the designs signed "Westward Ho!" which were by far the best, would be admirably fitted for a Hospital. The authors are Messrs. Coe and Robinson, of Furnival's Inn, London. Some of the competitors exceeded the limit of price the committee had fixed. While the amount named by them as the maximum of cost was £13,500, the estimates of the architects varied from £12,300 to £16,000. The design which for compliance with the specifications and general suitability stood next to Messrs. Coe and Robinson's was that of Mr. H. J. Snell, of Courtenay-street, Plymouth. One of the London architects who competed disqualified his work through a misapprehension, by placing his main entrance on the side of the site which faces Clifton-place, and thus giving his buildings an unsuitable outlook. The villa-Italian style is that which, according to the *Western Morning News*, has been followed by the designers of the new buildings. The total accommodation for the sick planned in the designs amounts to 96 beds. The sum required for the execution of Messrs. Coe and Robinson's plans in their entirety is calculated at £16,300, and the indispensable buildings will cost £13,500.

West Fen Board Schools.—On Wednesday week the School Board for West Fen, near Boston, Lincolnshire, met to examine the plans sent in, in competition for proposed new schools at Frith Vale and New Bolingbroke. Five sets of plans were examined, viz., alternative sets for both schools, from Mr. Thomas, of Boston, the one to be executed in red brick and slates, the other in white brick and tiles; from Mr. W. H. Wheeler, Boston; from Mr. Sawyer, London; and from Mr. Young, London. The first set shown by Mr. Thomas was chosen.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

British Archæological Association.—The first meeting of this session was held in Sackville-street on Wednesday week, with Mr. Thomas Morgan, F.S.A., honorary treasurer, in the chair. Among other matters discussed at the council meeting was a resolution moved by Mr. Loftus Brock, F.S.A., and seconded by Mr. Wright, F.S.A., to the effect that, in response to an appeal to the association by the Society for the Preservation of Ancient Buildings, every effort should be made to induce the Italian Government to abstain from reconstruction or renovating, if such be their intention, the portico of the Church of St. Mark, Venice, undoubtedly one of the most interesting specimens, both in an architectural and historical point of view, we have remaining in its original integrity of mediæval times in Europe. The motion, after some deprecatory remarks by Mr. W. de Gray Birch, F.R.S.L., as to any sort of interference in a matter where, probably, no such severe restoration as that referred to by so many people was intended, and by the Rev. Alex. Taylor, M.A., in a similar spirit, was, however, almost unanimously carried, on the plea that, when once restoration was begun, it was never certain how far it would go, as we ourselves in this country could well testify, and that, unfortunately, on the Continent, as well as in Italy, this state of affairs became the rule and not the exception. At the evening meeting some interesting notes on the manners and customs still existing in the Isle of Man were read by the Rev. S. M. Mayhew, V.P., who exhibited some objects of antiquity connected with Mona, and collected by himself during a recent visit there. The principal feature of the evening was the further consideration of the late discovery of an undoubted Saxon church in that of the ancient parish one of Escomb* in Durham, two miles from Bishop Auckland, by Dr. Hooppell, a letter from whom announcing the important and singular news (as the existence of such a Saxon building had been till then entirely unknown) having been read at the Yarmouth congress in August last. Mr. Loftus Brock, F.S.A., in producing to the meeting a careful drawing of the church, with various sections of its walls, windows, &c., which plainly showed their very early and peculiar construction, stated that fresh and most interesting discoveries had only lately come to light, and further remarked that, on clearing off some damaged plaster, it was found that the north wall of the chancel had been pierced in Saxon times for the insertion of a doorway, itself of Early character. This had been blocked up at a more recent date and plastered over. The inscription on a stone in the wall of the church now proves to be "COH. VI.," no doubt a reference to the 6th Cohort, so long stationed at York, and which stone was probably removed from the neighbouring Roman station of Vinovium, where it formerly indicated that the above cohort was once there on duty. This church appears to be the most perfect Saxon one at present known, for the original walling remains quite up to the roof, and all the gables are of the same early period—indeed, from some of the more recent-looking roof-timbers being of 13th century date, it is asserted that the older ones are Saxon also.

Building Intelligence.

Aberlour, N.B.—The memorial chancel and side chapels recently added to St. Margaret's Episcopal Church, Aberlour, were consecrated by the Bishop of Aberdeen on Sunday. The nave and side aisles of the church were erected in 1874-5 from the designs of Mr. Alexander Ross, of Inverness, and are in the Early French style. The new chancel is by the same architect, and is 30ft. in depth, being separated from the nave by a wrought-iron screen richly coloured and finished with gold, the work of Messrs. Jones and Willis, of Birmingham. The choir-desks are of solid oak, carved with figures of angels at each haffet. The altar is constructed, of white Caen stone, and is raised above the choir level by steps; the reredos is divided into three panels, containing the sacred monogram and an inscription. Above is a three-light east window filled with stained glass, representing the principal events in the life of our Saviour. The floor of the sacrarium is paved with figured encaustic tiles. On the north is a side chapel and on the south an organ-chamber containing an instrument constructed by Mr. Harrison, of London, at a cost of about £600; the case is decorated in gold and colour. The principal contractors for the additions to the church were Messrs. Reid, Patterson, and Fraser, masons, Inverness, and Mr. M. Beath, carpenter, Elgin. The capitals in the nave are being carved by Messrs. Dawson and Strachan, of Glasgow.

Carlisle.—An extensive block of buildings, comprising shops, show and warehouse-rooms, workshops and dwelling-houses, are in course of erection in Lonsdale-street for Mr. Jno. Moffet. The widening of Annetwell-street, where Mr. Moffet's old premises are situate, caused his removal. The principal contractors for the new buildings are Mr. Jas. Metcalfe for masonry and brickwork, and Messrs. Batey and Forster for carpenter and joiner's work. The total cost will be over £4,000. Messrs. Hetherington and Oliver, of Carlisle, are the architects.

Colchester.—The district church of St. Paul, near the main line station, was reopened on Thursday, the 20th, after enlargement and improvement. A south aisle and a choir vestry and porch, provision for which was made in the original plan of the church, have been added. The aisle is in brickwork faced with stone rubble, with Bath-stone dressings, and is 55ft. long by 14ft. wide; the roof is open and covered with tiles; the temporary filling-in of the south arcade has been removed, and the bases of columns moulded and the caps carved. The benches are executed in pitch-pine, varnished; and throughout the church the floor under the benches has been laid with oak blocks on cement, the passages being laid with Minton's tiles. The vestry measures 14ft. by 13ft., has an open-timbered roof covered with tiles, and there is a lead cross on east gable. At the south entrance is a half-timbered porch. Mr. Joseph Grimes, of Colchester, by whom the church was erected in 1869, has been the builder, and the designs were prepared by Mr. Joseph Clarke, F.S.A., diocesan architect. The outlay has been about £1,000.

Great Sutton.—The new Church of St. John the Evangelist, Great Sutton, Eastham, Liverpool, was consecrated on Monday. The cost of the building is £2,200. The building provides accommodation for about 250 worshippers, and consists of a nave and large chancel, with vestry and organ chamber; a south porch, with tower and circular spirelet, which rises to a height of 65ft. Externally the building is constructed of Minera stone in coursed shoddie walling, with dressings of Stourton stone. All the internal features and dressings are also of the latter material. The roofs are covered with silver-grey slate, from the neighbourhood of Machynlleth, and are surmounted by a red ridge. The flooring under the seats is constructed with woodwork paving in patterns, the aisles and chancel being paved with Godwin's encaustic tiles. The west-end window of four lights is of glass, designed by Mr. Henry Holiday, and executed by Messrs. Heaton, Butler, and Bayne. The pulpit, of Caen stone and marble, was designed by the architect. The contractors for the entire works were Messrs. Tomlinson and Sons, of Leeds and Chester; and the style of the building is of the Middle Pointed period. The edifice was designed and superintended by Mr. David Walker, architect, of Dale-street, Liverpool, who has also been intrusted with the designs for the new Eleanor schools and residence now being erected upon the same site.

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* See our illustration this week.

Horsham.—A large engine-shed, offices, and turntable have just been completed at Horsham for the London, Brighton, and South Coast Railway Company. The shed is semi-circular in form; the back and end walls and walls of offices are picked grey stocks, relieved with red brick arches and bandings; the front is formed with No. 11 cast-iron columns, 11ft. apart, each opening fitted with a pair of gates hung to the columns; the roof is constructed of wrought iron in trussed principals, and trussed wood purlins to receive the 1¼in. yellow batten boarding, which is laid diagonally and slated; the upper portion of the roof is treated in the same way, minus the boarding, and left open between the purlins, and covered with W. E. Rendle's patent system of glazing. The turntable is 45ft. in diameter, and constructed to carry 100 tons. There are 10 roads off the table into the shed, which is intended to hold 10 large-size engines. The works have been carried out by Mr. J. Anscombe, of Brighton, from the plans of Mr. T. Bannister, engineer to the company. The resident foreman of works was Mr. F. Chettleburgh.

The Scottish Corporation Halls, Old and New.—The 215th anniversary of the Scottish Corporation is to be held on Monday next, and a brief description of the new hall of the Institution, which occupies the exact site in Crane-court, Fleet-street, of the old hall, destroyed by a fire, the origin of which is still a mystery, on Nov. 14th, 1877, may be opportune. The old hall was built by Sir C. Wren in 1650, and previously to the great fire was the residence of Dr. Nicholas Barebones, founder of the Phœnix Fire Office. From 1710 till 1782 it was the meeting-place of the Royal Society; but when the society removed to Somerset House the Scottish Corporation purchased the premises, and have since assisted their poor by out-door pensions. In the fire of two years since not only the building was destroyed but all the contents, including the charter and seal of the Corporation, all its books, records, and pictures, the last including a full-length of Mary, Queen of Scots, said to be by Zucchero, and another, William IV., painted and presented by Wilkie, in 1831. The new edifice, now rapidly approaching completion, is in the Scottish Baronial style, and has been erected from the designs of Professor Donaldson. Into the old site the area occupied by four houses in Fleur de Lys-court has been thrown. The building is of picked stocks, with quoins and cornices of red brick, and mullions and other dressings of Ancaster stone. The chief front to Crane-court is marked by flanking circular angle turrets, with slated conical caps. Above the chief doorway is an oak shell and an inscription carved in stone, and a stone string-course in which thistles are repeated. The building comprises three floors. From a chapel or waiting-hall, of irregular form, measuring about 43ft. 9in. by 35ft., with offices adjoining, a chief staircase in oak leads to the hall, which is 43ft. 9in. by 18ft., adjoining which is a committee-room, 19ft. by 15ft., and an office 23ft. by 17ft. Between the hall and chapel a mezzanine is obtained for offices. On the second floor are ten rooms for officials, including a suite of apartments for the secretary. The principal hall measures 44ft. by 18ft., and 16ft. in height, and the mode of decoration proposed is unusual. Running round the walls, close to the ceiling cornice, will be thirty panels, each 2ft. 9in. high by 2ft. 6in. wide, and it is proposed to insert in these panels, emblazoned in colours, the coats of arms and mottoes of the different Highland clans, and the name of the present head of the clan. These and the elaborate ceiling will be in pitch pine, and the dado and flooring will be in oak. Over the fireplace will be erected a massive stone carving of the Royal Arms, with the Scottish motto, "In Defence," a relic which has been in the possession of the Corporation for about two centuries. The mantelpiece will be of white marble, richly carved and relieved on either side by a polished red granite column. The estimated cost of the building is about £6,000. Mr. Hobson, of Duke-street, Adelphi, is the contractor; Mr. W. H. Chapman, the clerk of works; and Mr. Jas. Miller the foreman. The work is being carried out under the superintendence of Mr. A. Williams.

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Cases for binding the half-yearly volumes, 2s. each.

Received.—W. F.—B. C.—W. T.—J. B. S. and Co.—B. J.

"BUILDING NEWS" DESIGNING CLUB.

F. and G. Goodrich. (A side passage is allowable as an entrance to basement. We cannot furnish details of criticism, as the drawings are returned, and you do not give your motto. Drawings are returned free of charge.)

If "I. Strive" and "Omnia Vincit Labor," of last year's series, wish their drawings returned they must send their names and addresses. In the present series we require also the names and addresses of "Duncan Macallister" and "Sub Rosa" before the designs can be returned to their authors. We cannot be responsible for the return of drawings unless the names and addresses of their authors are written on the back in all cases.

Drawings Received.—Tace, Heart and Arrow, Ogmore, Fleur-de-lis, Clansman, Semper Paratus, Burswell, B., Pro Bono Publico, K in circle, Mediocria Firma. Minted, War in circle.

Correspondence.

ALL SAINTS' CHURCH, MAIDSTONE.

To the Editor of the Building News.

Sir,—Let me echo Mr. Gilbert Scott's protest against tampering with the organ in All Saints' Church, Maidstone. It was carried out—I fear to think how many years since—by that architect of rare promise, Richard Carpenter; I have ever since believed that it has been looked upon by all who love and study the science of church-arrangement as a classical model of its kind. I have certainly, myself, always pointed to it as such.—I am, &c.,

A. J. B. Beresford-Hope.

Bedgebury Park, Nov. 22, 1879.

"ANOZER TUTCH VINT-MILL."

Sir,—Mr. Punch's kindly satire, as expressed by the facile pencil of Du Maurier, plays upon a foible which seems to affect the great men of all time. It seems to be one of the hallucinations of genius that the career in which its greatest successes are achieved is not *the* one which its merits best deserve. The round men long for square holes, and the square men for round ones; and some exceptionally-gifted creatures think they can fill round and square indifferently, as Bottom was ready to undertake all characters, from "The Lion," to "Pyramus, that sweet-faced knight." The elder Mathews was persuaded that tragedy was his forte, and as his biographer sets forth, actually played *Othello* (only once) at Liverpool, while that dear, droll, stolid, little Keeley, of all men in the world, could not rest content until he had experimented upon a provincial audience with *Shylock*—a performance attended with no encouraging results whatever.

The same illusion obtains amongst distinguished men in all walks of life. Mr. Gladstone leaves the political arena, where he shines almost without a rival, to write polemical tracts on abstruse theological questions; and Mr. Ruskin (not to multiply instances) has more than once put on record the fact that his true strength lies, not in questions of art and art-criticism, but in—political economy.

The theologians can see but little in Mr Gladstone's elaborate essays, and the political economists shake their heads at Mr. Ruskin's fanciful social theories. But the game still goes on: the painter leaves the painting of good pictures to compose bad music; the musician wastes his time and bores his friends with tenth-rate water-colour drawings; and a Parliamentary Counsel of the highest eminence, and perhaps unequalled abilities in his own sphere, steps gaily forward and complacently presents the public with "Anozer Tutch Vint-mill"—I mean a rectory-house.

There is, perhaps, but little harm done—beyond a fruitless waste of time—when an amateur's work is put forth as such, and with becoming diffidence; but when the amateur declares that he alone is right on all points theoretical and practical, and that those professors of the art upon which he encroaches, and who give their whole life to its study, are a set of blockheads—like the juryman whose hard lot it was always to be shut up with eleven idiots, the matter wears a different complexion.

Such a practitioner must not be surprised if, in going out of his way to submit his works to public judgment, he meets with very candid critics.

The learned author of a "Book on Building" has had the temerity to give a very practical effect to his views, and the result is given in the Building News for the 21st inst.

The aspect of this structure is at first a little startling, when taken in combination with its title. By common consent, something of a quasi-ecclesiastical character has been accepted as appropriate to such buildings. The stoutest anti-Goths allow that Gothic is appropriately employed for churches and, with some modification, for parsonage-houses.

This is, however, a question of taste, and I am quite ready to allow that the author of the design in question may possibly have "exquisite reasons" for the style (or want of style) he has chosen to work in, and which is spoken of by the builders as being "Queen Anne." But to turn to the plan and construction of the house, one cannot but see that there are points about it which are not only at variance with the practice of the most expert house-builders (which its author would doubtless consider a merit), but, what is more surprising still, it is at variance with the published views of the architect himself.

I am not careful to dissect the design and go over each detail—it is an ungracious task, and one by no means congenial to me. Men are but men; the best sometimes forget; besides, the plan, as might have been expected from so clever a man, is not wholly bad—it has its good points.

The first thing about it which strikes one in running one's eye over it, is the absence of the customary butler's pantry, and the circumstance that, from the absence of a servants' hall, the kitchen must be used as the only sitting-room for the servants. If there is no man-servant in the house (it cost £4,000), there must, one would think, at least, be a "Buttons." But even if the place is filled by a "neat-handed Phyllis," the cook will be of an exceptionally placid temperament, who can see her kitchen occupied as this one must apparently be occupied (and traversed) without complaint.

It may be that the parish-room is arranged a "double debt to pay," and is to do duty as servants' hall.

It is further possible that these are arrangements imposed by the rector, and that the architect, as often happens, is not responsible for them. The long passage, dark and draughty, running E. and W. and bisecting the whole house, and the absence of an enclosed entrance-porch or lobby does not, however, strike one as a comfortable arrangement, and the route from the drawing-room (which must be a handsome apartment !) to the dining-room is accomplished by a sort of military evolution, which is, to say the least, undignified.

An example of the "architect's" skill in planning is seen in the place assigned to the principal w.c. on the ground-floor. The position of this apartment is one of the surest tests of good planning. It should, like the original "S. G. O ," be never in the way and never out of the way; easily found and free from disturbance: "A privy chamber," in short. In the plan under notice it occupies nearly the very worst possible position; and I hear that, in consequence, the rector proposes to erect another out of doors for his private use, in the hope of finding in the seclusion of the shrubbery that repose which his architect has denied him in the house. It is placed partly under the first landing of the principal stairs; it is close to the door leading from stairs to kitchen. It is immediately adjacent to the door to parish-room (? + servants' hall) and to the external door of that room; it projects partly into the kitchen, and is next to the dresser. It is almost impossible to conceive a more embarrassing position for its temporary occupant: the servants in the kitchen sitting in judgment upon him; every motion of the apparatus distinctly audible; and, to complete his discomfiture, a window is provided close to the outer door, having a step under it, for the further accommodation of the inquisitive.

Three of the bed-rooms, for no apparent reason, are lighted by skylights only, contrary to the author's expressed views as to the use of skylights, whilst the H.-M.'s C. on the upper floor is buried in the middle of the house, without even a skylight.

There must be some error in the drawing as to the back staircase—the words "to cellar," and "back-stair" being reversed; otherwise, as there is no width for a return flight, if would seem as if the servants' stair ended in a bath, or was approached only through the scullery.

But, granting a satisfactory defence to all these peculiarities of arrangement, what can be said for the following item of *construction ?*

The house is in plan a parallelogram, about 60ft. by 48ft., and the roof is hipped on all sides; but, instead of being covered by a flat on the top (30ft. by 20ft.), the slopes of the roof are returned inwards on all four sides, forming a deep, inclosed well, with a gutter at the bottom.

The water flows from this gutter along a trough, through one side of the roof, and over the ceiling of the bedrooms.

Now listen to its author on "gutters"—

> "Gutters of roofs within a parapet are generally laid on boards supported by cross-pieces of wood, and many a building has been burnt down from that cause when plumbers were mending the roof. Besides that, the wood rots and the gutters sink, so that this ingenious contrivance has the double chance of destroying the building by fire and water. But even all gutters, *within parapets*, involve more risk of water getting in than spouts outside, and require constant attention to keep the outlets free, &c., &c."

What, one may ask, are the dangers from gutters within parapets to the dangers which may result from gutters in the middle of the house? Does it ever snow at St. Alban's? What can be the reason for this pit or catchwater in the very centre of the building, with all its added gratuitous "perils by water"?

Of the exterior appearance of the structure I have but little to say. I have not seen the actual building, and the published drawing *may* misrepresent it to its disadvantage, although I am assured it is a flattering likeness. The description of the colouring may at least be accepted as an accurate one, and the "dark purple-brown bricks used throughout, even for the arches, the *dark brown* tiles, and the sashes finished a *dark* colour," call before the mental vision a gruesome picture.

The "figure subject" over the principal entrance is effective—certainly, though, perhaps,

> "There are, to whose presumptuous thoughts,
> Those freer beauties, even there, seem faults,
> Some *figures*, monstrous and misshaped appear

* * * * * *

Still, about questions of taste it is proverbially futile to dispute, and the severest critic will, at least, allow that, with the above exception—

> "No single parts unequally surprise,
> All comes united to th' admiring eyes;
> No monstrous height, or length, or breadth appear,
> The whole at once is *bold* and *regular*."

It is as well, perhaps, that every style of building should have its exponent, and the open-handed liberality of Sir Edmund Beckett in matters connected with architecture gives him greater claims to our consideration than many others possess. It is, nevertheless, to be hoped that, as Mathews was satisfied with playing Othello *once*, he, too, may be dissuaded from giving further practical evidence of his skill as an architect; that he will confine himself to that occupation in which he shines without a rival, and not fritter away his great abilities in the production of "Anozer Tutch Vint-Mill."—I am, &c., E. Ingress Bell.

ST. ALBAN'S RECTORY AND SIR EDMUND BECKETT.

Sir,—Dare we mere architects pass any remarks on plans made by so great an authority on the faults and shortcomings of the profession as Sir Edmund? Well! Let a fool rush in for once, while the angelic Baronet himself looks down in pity. I don't understand the back-stairs, to begin with; but, as the house is built, I suppose it must be all right. The plan as given by you shows a stairs down to cellar from scullery, so that the first step up of back-stairs would appear to be close to door of w.c. on ground-floor; but this would land one into the bath upstairs—though the first-floor plan shows the last step of back-stairs opposite the w.c. above. Is it well to have to go to-and-fro with knives—perhaps in rain—across yard? Would it not be better to reverse coals and knives, and put a door in scullery-wall near cellar-stairs? Even if the coals are kept where they are, would not this door be a good thing, instead of having to go out for coals in wet and dirt, and to take them through part of the passage afterwards? The kitchen has three doors; and, if I don't greatly mistake, before the dinner is served, "You shall," in the words of Hamlet, "nose it as you go up the stairs." Is it well to have shelves round the three principal walls of pantry, and no fireplace? I should put a fireplace in the end wall, and a sink in end window. I can't understand why there should be no window to a storeroom; but perhaps this is a mistake of the lithographer. I should reverse the position of the store and larder, for two reasons—at present the larder door is close to a hot spot (the back of dining-room fireplace), and it would be nearer to fresh air and the kitchen and porch doors if changed. The w.c. under principal stairs is "commanded" by the drawing-room, library, porch, and parish-room doors. Upstairs we have a housemaid's closet, lighted *by a borrowed light*, and this, too, from the night nursery, the door of which has the advantage of the close proximity of both w.c. and housemaid's closet-doors. The fireplaces of both the day and night nursery have a door close to them, while the day-nursery fireplace has in addition a door from the passage opening directly on it—good for children with colds. Across the ceiling of one of the bedrooms on upper floor there is a gutter to take the water off roof. This arrangement I have been always taught to avoid as the worst possible—every architect, I presume, knows why. In this case I would have hipped the roofs at back, and got over the necessity. The down-pipe might then have been worked in usefully for flushing the two w.c.'s. But, in any case, the gutter (even if covered) should have gone in this direction, because if it got stopped (as probably it will some time or other) it would do less damage over passages than over furniture of "spare bedroom" and other apartments, and a trap-door could have been easily formed to get at it (near the head of back-stairs). Now turn to the elevation. There is an ornamental band-course of brick, which might easily have been made to range with the eaves of parish-room and of dining-room bow; to say nothing of its being worked in with the pediment over doorway. There is a blank window over one side of drawing-room, which, I suppose, Sir Edmund thinks an improvement to the elevation. Perhaps it is; and, of course, if *he* thinks so, he must be right; but, I confess, I'd rather see it turned into a real window and set in the blank wall of parish-room. I should, as a mere architect, have placed a fireplace in hall; or, if I didn't (for some good reason) do this, I would not have projected the back of the drawing-room chimney-breast into it; but this is a very small point. I have written in fear and trembling, and subject, of course, to Sir Edmund's opinion. If he disagrees with me, there is no more to be said; and I give in "straight off," as I am not a "Jingo," and don't want to fight.—I am, &c., J. F. F.

Sir,—I trust that the plans published from time to time in your journal are not all supposed to be examples to be followed. There are such exceptionally serious defects in those of St. Alban's Rectory, illustrated in your last issue, that I am tempted to ask you to find space for the following notes upon them.

The position of front and back doors immediately opposite to each other, with only one door between, is bad, aggravated by being at the end of a 67ft. long passage, right through the centre of house.

The w.c., under landing of main staircase, is in the very worst possible position; the smell would travel up the well of staircase and permeate the whole house, mingled occasionally with the smell of cooking from the kitchen-door adjoining, and the working of the w.c. apparatus could not fail to be distinctly heard by the servants in kitchen.

The entrance to parish-room is very awkward, the lobby simply a square, thoughtlessly taken out of corner of room; and if the exterior entrance door opens to the right hand it will block up the door to room, and if to the left, the door to house.

The servants' staircase is difficult to understand from plans, as it is shown to start and land at the same point, and this in one flight; however, it most likely commences from scullery, instead of to cellar, as printed. Whichever way it is, the difficulty would be to get servants to use it in its absurd position, by far the nearest route from kitchen to the majority of first-floor rooms and the whole of second-floor, being by the main staircase.

The situation of ashpit, immediately adjoining main wall of house, is not desirable.

There is no position in which to place a small bed in dressing-room over entrance.

The housemaid's closet, and sink for slops, in the centre of house, with no exterior ventilation, and a borrowed light from the night nursery, it is difficult to find words to sufficiently condemn, and would not be sanctioned by the sanitary authorities of this district.

The gutter in centre of roof, with branch across first-floor ceiling, is a good example of what to avoid; its only advantage seems to be that after a fall of snow the rector and his family may have an opportunity of indulging in the pastime of snowballing for a few weeks longer than their less privileged neighbours.

The designing of elevations is a matter of taste, and what is "one man's food may be another man's poison"; but the entrance door-piece is very primitive, and can hardly be called a success, and there can be no doubt of the *date* of the erection.—I am, &c.,

Nov. 24. Bernician.

Sir,—The thanks of the profession are due to you for illustrating in to-day's number a design by the self-constituted censor of architects, Sir E. Beckett, Bart., Q.C. As the (variously) learned Q.C. is very flippant in his criticism of the work of modern architects, he can scarcely complain if he is told that his rectory house at St. Alban's combines many defects in its plan with much ugliness in its elevation, and is very disappointing after the expectations raised in the minds of readers of a "Book on Building," who were informed that architects copied their ideas "after I did this (that or the other) at Doncaster" (or elsewhere).

In the first place, no porch or outer hall is provided, to cut off casual callers from the inner hall; a great amount of space is lost in halls and passages—that to the pantry must be very dark, unless glass panels are inserted in the doors. The principal staircase is mean and inadequate for a house of such dimensions. The w.c. on first-floor is an inconvenient distance from the principal bedrooms. The housemaid's closet is in a most unwholesome position, and cannot be properly ventilated; a large dressing-room is rendered practically useless by the bath being placed in it, instead of in a special bath-room. Three of the bedrooms on the upper plan are lighted by skylights instead of the much more cheerful dormer window; and last, not least, the most inconvenient plan of roof, viz., the fish-pond roof, is employed by the learned Q.C. I can imagine his virtuous indignation if an architect employed such a roof. He would be asked, Did he forget that it ever snowed in this country; or that there are leaves on the trees, to fill up and choke the central gutter and—equally admirable contrivance—the shoot to convey the water across the ceilings? Let us trust that it will never snow on that house; if it does, the rectory servants will have a busy time of it providing pans and buckets to receive the superfluous moisture which will surely find its way, where it is least wanted, into the beds and bedrooms.

The elevation is perfectly hideous. Witness the ill-proportioned ugly porch, with the date and scrawling over it; the blank window in the garden front, and the half-starved-looking attics and chimneys shooting out of the roof everywhere, when, if a little care or thought were used in the design, they might be placed centrally on the ridges. Sir E., in his famous book, abuses and derides architects for some special niche made; he has, it seems, now changed his views.

The entire design proclaims the fact that, although Sir E. may be a very good Parliamentary Q.C., he is, notwithstanding his self-assertion, a very bad architect, and that he ought to leave the designing of houses to those whose business it is, and who have made it the study of their lives.

I wonder how he would feel if there were free-trade in law; and that architects, so much despised by him, were free to poach on his preserves, and, in addition, write abusive books about him and his profession, which he well knows is open to many strictures?

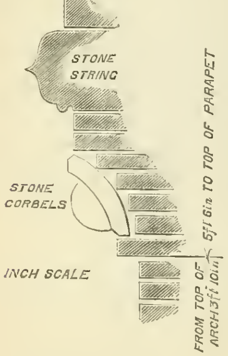
I now see that he wishes to have it all his own way with St. Alban's Abbey. I suppose that he, as well as his readers, are tired of "What I did at Doncaster," and that he is preparing to write a new book, the burden of which will be, "What I did at St. Alban's."—I am, &c.,

An Irish Architect.

RESTORATION AT ST. ALBAN'S.

Sir,—Mr. Chapple is not the only one connected with St. Alban's who disbelieves in the lines of the Norman roof having risen so high as the top of the old corbel table, or in the existence of evident marks of the verge lines of the old roof against the tower. He is probably the only one who would pretend to deny the existence of this evidence upon such assertions and implications as he has not scrupled to put forth.

This corbel table was one of great interest. It does not figure in Mr. Neale's book except in the small-scale south elevation. I trust, therefore, you will admit a detail of it, as I found it on November 28th, 1878. If Mr. Chapple is able to furnish a more accurate one, I hope that we may have the benefit of it in your columns.



If the dimension of 5ft. 6in., which he gives, were measured from the corbel table downwards, it would cut through the external face of the Norman wall, into the heads of the Norman windows below. It does so happen that 5ft. 6in. would, according to dimensions which I took, reach from the bottom of the old corbel table to the top of coping of parapet. But if this were the dimension to which he referred as giving the extent of the raising of the wall in mediæval times, it would be proving too much for his purpose. It would show clearly that the corbel table existed prior to the mediæval raising, for it is absolutely impossible for it to have been inserted subsequently to the building of the parapet which was carried by it.

Instead of explaining or excusing his apparent mistake, in his assertion that the so-called corbel table was built of modern material upon a wall raised 5ft. 6in. in thirteenth-century rubble work, he now "emphatically denies the existence of such corbel table altogether." This may be merely an incorrect, and misleading way of expressing his opinion that the corbel table was not of "Norman" date, or "Norman" work, just as he speaks of the great length of the roof as bearing upon the question of its verge at one end. How far this is honest or honourable I will not venture to say; but if he have any self-respect or consideration for those whom he may be supposed to represent, it may be well for him to pause before further compromising himself and them by such inconsistencies. When he gets into a corner he may, for self-defence or for amusement, take to the entertaining pastime of mud-throwing, without regard to the effect it may have either upon himself or upon those on his side of the dilemma in which he is pleased to place them as well as himself, if they acquiesce in such reasons and excuses, seeing that it is only under their direction and control that this work can have been carried out. I am in no way concerned to defend every step I have taken for the last thirty years and more, whilst maintaining with more or less success, both in principle and practice, the cause of conservatism. But I am very deeply concerned at the serious and irreparable damage which this cause has sustained in the example set at St. Alban's by such reckless and unnecessary demolition. He has read my letters with no more care or accuracy than he has the history of the structure of St. Alban's, or he would have seen that although I lamented the loss of the corbel table, not only as an interesting detail, but also as obliterating all trace of the lines of the Norman roof, I did *not* impute motives. Had I done so, I should have imputed, to the restorers at all events, the only true one possible, viz., the laudable desire to make as noble and perfect a restoration (according to their lights (?)) as possible.—I am, &c., William White, F.S.A.

Wimpole-street, Nov. 24.

ST. MARK'S, VENICE.

Sir,—In the venerable front of St. Mark's, Venice, the ever-busy, if seldom-judicious, Society for the Protection of Ancient Buildings have at last found an object deserving their care, and in its would-be restorers foemen worthy of their steel. We could wish them good-speed if there were any chances of their well-meant efforts proving successful. Sad, however, as would be the loss of much of what the educated world and, it appears, even Italians themselves, have just awakened to appreciate, it is almost sadder to witness the havoc of lances broken by these modern Don Quixotes against the dread windmills of this prosaic age. The society kicks so often and so vigorously against the pricks, and becomes so elated by the exercise, that it is to be feared that success would rob their work of its zest, and themselves of the crown of their martyrdom. Those, however, who, like ourselves, would prefer moderate and actual advantages to loftier but impracticable aims, would do well to fight the battle under other banners than those which are so wildly, but often so vainly, flourished by Mr. Morris and his friends. Instead of shouting out that restoration is a synonym for destruction (which the sober world will not accept as an axiom even from them), it would be far better to distinguish between what is true restoration and false. Instead of assuming that all the professional experts of Venice are ignorant and sordid and callous, and denouncing them as such without waiting to hear what they have to say in reply, how much better it would be to try to instruct and to interest them as to the nature of the work they have to perform! That this, if it be really intended, will be done, whether we may judge it necessary or not, seems tolerably obvious, unless we are prepared to move our fleet from the waters of the Bosphorus into the canals of Venice, and to try persuasion of a more potent order than any that this society or their Oxford friends are able to command.

Arguments based upon facts, however, would be more likely to have effect than wild denunciations unsupported by evidence. That the Italian Government, or those who have projected this restoration of the façade of S. Mark's, regard it in a patriotic reverent spirit can hardly be denied, in the face of their being ready to spend such a sum upon it as would be necessary to rebuild it. It is not to be credited that only a churchwardens' job, for sake of the profit, is in contemplation, such as that we ourselves have just patiently watched and submitted to in the case of St. Mary-le-Strand. Rightly or wrongly, it has been asserted that the whole fabric of this façade is in danger of falling. If rightly, surely the society is not anxious that it should be suffered to crash, that they may enact the part of Marius lamenting among the ruins of Carthage. If wrongly, let us have evidence of the fact, so as to be able to confront that of the engineers who have reported the reverse, rather than apply epithets such as those indulged in by the President of the Royal Academy (viz., "ruthless and ruinous") to men who are seeking to preserve for future generations some shadow (let it be) of a substance that they declare to be on the point of dissolving from our view. As I write, I read that St. Mark's doughty champion, Mr. Morris, has just opened his eyes to the fact that his lance has broken in his hand against a windmill of his own erection, and that the façade of the church, at any rate, is safe for the nonce. Hoping with him that the pavement also may be left as it is, but feeling that it were hardly necessary to send off summary despatches to our fleet on its account alone,—I am, &c.,

John P. Seddon.

Queen Anne's-gate, Westminster, Nov. 24.

OLD HOUSES AT EXETER.

Sir,—Another old house, one that for several hundred years has gone far to give an individuality and character to High-street, Exeter, has just passed away. I refer to the quaint old edifice standing at the corner of Exon's main thoroughfare and a narrower one known as Goldsmith-street, a building which attracted attention, and that of strangers especially, by the curious manner in which it was incorporated with the ancient church of All Hallows. This church, referred to in the taxation of Pope Nicholas IV. (A.D. 1291), is very small, and stands alongside Goldsmith-street, its eastern end abutting on to the High-street. In the angular space between the south and east walls of the chancel and the two pavements, the house in question stood—at least the lower rooms of it did, for above that the place was built in a great measure on the *top* of the church to which, parasite-like, it clung. The two, each helping the other, might have remained many a long year more pleasantly enough, had not the "improvement" mania possessed the good people of Exeter, and to that feeling the building has succumbed. Further, application is being made to Parliament for the removal of the Church also, it, too, being deemed an obstruction. It is passingly interesting to observe that in the just-demolished house the grandfather of Sir Evelyn Wood (the Zululand hero), himself the son of an Exonian, served an apprenticeship as a chemist and druggist. This Devonshire lad lived to be twice Lord Mayor of London, was member for the City of London, and was the father of Lord Hatherley. Recently, it may be remembered, Sir Evelyn Wood received the freedom, by patrimony, of the Fishmongers' Company at the Guildhall, he being entitled to it through his father and grandfather. It was in 1815-16 that Sir Matthew Wood was Lord Mayor of London, and so it would be somewhere towards the close of the last century that he was a chemist's boy in the old house just rased to the ground. The place continued to be a chemist's until its end.

The next set of old houses doomed to come down are the picturesque pile of buildings upon the old Exe bridge. They have already been referred to in these columns. When a fresh springtide pushes out from the ground new daisies, these houses will, alas, have gone the same way that so many have gone before.—I am, &c., Harry Hems.

MATHEMATICAL INSTRUMENTS.

Sir,—I have used mathematical instruments for forty years, and have continually wondered at the lack of improvement in such things. The simple lead without wood for the compass, of late introduction, is an improvement of value, but the receptacle for it is very clumsy, and allows too much point to project, and it is therefore apt to be broken off. But what a long time we have waited for this!—such leads having been common this last fifty years. The instruments generally are too clumsy and not well finished. I have never seen a thoroughly good set of instruments yet. In the matter of scales: the two most generally used are the "eighth" and the "inch," the one for general drawings, the other for details; with these come naturally on same edges the "quarter" and the "half inch." Rarely are any others used by architects, yet the generality of scales have twenty or thirty varied divisions, increasing the price of the article, and little or no good. It would be a great improvement as regards the eighth scale that it should be made to range to one hundred divisions instead of the ninety-six making 12in., the scale requiring to be an ½in. longer; the other edge being divided for the inch scale, and kept to 12in. in length. This would be of great service.

The generality of curves are useless from the lines being so generally parts of circles. They should be conic sections.

I have been surprised that draughtsmen use the rolling parallel so little. The mischief of the set-square is its making the paper so dirty. Why are they not made with the centre part removed, merely enough substance to give the edge?

From their soiling the paper so much I rarely use a set-square, and, acting on my advice and example, many draughtsmen have adopted the use of the parallel rule, to the exclusion of the set-square. These three things are required of instrument makers:—Eighth scales cut to a hundred, curves cut to conic sections, and set-squares made open.

In conclusion, I beg to express my hope that draughtsmen will, by your kindness, "ventilate" practical matters in your columns.—I am, &c., M.

KNIGHTSBRIDGE BARRACKS.

Sir,—It seems to me that the London correspondent of the provincial paper, whose remarks on the above barracks you quoted on the 14th inst., has been indulging in a good deal of gratuitous grumbling, and I quite agree with "P. D. A.," who replied last week that the criticism in question must been a source of much amusement to many of your readers. "P. D. A." has effectually disposed of the error as to the authorship of the much-maligned designs; but it is no secret that the War Department, in virtue of a long-standing arrangement with Mr. Wyatt, selected his drawings for the elevation, and reserved to themselves the right of providing their own specifications and quantities and furnishing also their preparatory plans for all the internal arrangements.

But for the arrangement with Mr. Wyatt, the Royal Engineer Department could no doubt have prepared complete designs, and I daresay the result would have been a building which, without reflecting in the least on the present edifice, might have been an ornament to the park. I judge of this from the fact that the Royal Engineer Department have designed most of (if not all) the new military centres throughout the country; and, as I have had occasion to visit the majority of these (having supplied all the locks for about thirty barracks, including Knightsbridge), I think there is little cause for grumbling, either on the score of architectural merit, "light, air, or sanitary arrangements." There can be no question that the British soldier is not only the best fed and the best clothed, but the best housed soldier in the world, as well, and I think the Royal Engineer Department and Mr. Wyatt are to be congratulated on their joint plans and designs for Knightsbridge, which, I may add, have been admirably carried out by the contractor, Mr. George Shaw.

Allow me to say also that the London correspondent in question is quite "at sea" in appealing to Her Majesty's Commissioners of Works in connection with barrack buildings. These come under the exclusive control of the Royal Engineer Department, and I need scarcely say that this department is quite distinct and independent of H.M. Office of Works.—I am, &c.,

James Hill.

37, Upper Thames-street, E.C., Nov. 27.

YORK STAIRS WATER-GATE.

Sir,—I see in the last number of the Building News two letters, provoked by my lately-published drawing and the suggestions accompanying it. Although, perhaps, our discussion may not be productive of great results, I must beg a little space to reply to the proposals of your correspondents. That of "C. F. M." is a portion of the scheme of "Aqua et Præterea Nihil," who asks, first, why the building should be raised? The answer is simple: That it may be properly seen. The appearance of a building in a hole is most unhappy, and there are in London some examples of that condition which ought to serve as warnings. One need only regard the pitiable position of St. Saviour's Church, Southwark, for instance, to realise the effect in question. Very few passers-by would go down into the proposed excavation to get the proper view: a building had better display its beauties than wait for them to be sought for. The remains of St. Paul's cloisters do not afford a parallel case with that of the water-gate, because the position of fragments of an edifice which has disappeared, and been replaced, is of as much interest as their appearance. But the gate is complete, and is still a gate; and, moreover, unless made to serve as a gate, will on its present site be an obstruction.

"C. F. M." pleads that it shows us where the river was. The position of the former margin would be just as truthfully shown by the structure raised *upon its old foundations* as it is now. As to the level of the river, I think that when that becomes different the York-stairs Gate will be of little use as a standard. It must be remembered that such a structure does not indicate the water-level at all. The flight of steps to which it appertains might be ten in number or a hundred; and it marks, not the bottom, but the top of them. If Macaulay's New Zealander should want the story of the stones, he will go to the bottom for the truth, and there it would be left for him in those original foundations and platform.

As to the idea of forming a pool by the gate, that seems to me out of the question. However sweet the water may be in the flowing river, it would not be acceptable in a stagnant condition, besides which, the obstruction would be still greater. Veneration for beautiful antiquities is admirable, but it must perforce be secondary to modern necessities; and, indeed, I think that it would be more graceful and more reasonable to allow the edifice which adorned the former thoroughfare a similar dignity upon the required new one, than to consign it to a position of something worse than uselessness.—I am, &c.,

Robert Wm. Gibson.

14, Albion-road, Clapham, S.W., Nov. 24.

LINGFIELD.

Sir,—I regret that illness has hitherto prevented me from replying to Mr. Mackenzie Walcott's letter in your issue of the 14th inst.

Pens, it seems, are given to slip—Aubrey's when he wrote Carthusian for secular priests, mine in spelling *poupée* as *poupet*, a word I used as best describing a high stall end, and which poppy-head or bench-end do not seem so readily to suggest. And Mr. Walcott's pen also slips and slides occasionally. I will furnish him with an instance should he desire it.

Of the slit across the stall-end, I wrote "that this feature was used for a confessional seems extremely probable." Mr. Walcott denies this, point-blank, by asserting, "Most certainly there was no confessional, but the slit, from other analogies, may have been connected with an offering-box."

Would your esteemed correspondent kindly point out the "analogies" which should lead us to consider that a slit in a stall-end "may have been connected with an offering-box"?—I am, &c.,

J. Lewis Andre.

Horsham, Nov. 25.

POUPET.

Sir,—The Rev. M. E. C. Walcott asks, "What is a poupet?" The word is a corruption of the French *poupée*, a small figure. Hence we have puppet and poppy-head. M.

Intercommunication.

◆◆◆

QUESTIONS.

[5956.]—**Deflecting Ventilator.**—Will "G.H.G." explain me more fully what a "deflecting ventilator" is? The term so used is new to me. This you have evidently overlooked, as you have omitted to give an answer. Will you kindly do so in your next?—J. R.

[5957.]—**Celtic Ornament.**—I should be obliged by a few hints on designing interlaced strap or ribbon ornament. It is very confusing to me, but there is evidently method in it. Is there any work on the subject to which I could refer?—J. G.

[5958.]—**Cementing Marble to Mahogany.**—Will some reader kindly inform me of a solution that would act as a cement to connect one piece of marble with another of mahogany, and whether it will stand the damp?—Compass.

[5959.]—**Brown Ink.**—Can any reader tell me what kind of ink is used for large coloured perspectives we usually see in competitions, &c.? It is of a brown colour. Does it wash in colouring?—I. G.

[5960.]—**Civil Service Competition.**—I should feel obliged to any reader for information respecting examinations for those competing for situations in the Office of Works as assistant surveyor. What books should I study, and can I obtain specimens of papers set at former examinations?—X. Y. Z.

[5961.]—**Sewer Ventilation.**—On p. 53 of the Building News of Jan. 14, 1876, Stott's system of ventilating sewers, by connecting the drain to the underside of a furnace, is described. At that time the plan had been adopted at several places, notably at the Halifax Workhouse, where it was said to be a success. What are the objections, if any, to this arrangement? I suppose it is only possible in a manufacturing town where there are fires constantly burning. Can you tell me where else, besides Halifax, this system has been adopted?—C. F. M.

[5962.]—**Architects' Rights and Responsibilities.**—I shall be glad to be informed on the following points:—1. Has an architect right of possession in plans, specifications, and working drawings (details) he has supplied before the works are completed? 2. If a proprietor has reason to be dissatisfied with an architect, and employs another to complete the work, has the former a right to claim possession of plans, working drawings, &c., if the proprietor tenders the full amount of the commission agreed between the parties for plans, travelling expenses, and superintendence of the works to their completion? 3. Has an architect whose services are thus discontinued any grounds to claim compensation for such dismissal when his fee is paid in full or tendered? 4. Can you refer me to any "decisions" on these points?—X. Y. Z.

[5963.]—**Colouring and Finishing Cement Work.**—I am erecting a block of houses at the sea-side, and am finishing the walls in cement. I wish to finish the work generally a warm buff or Bath-stone colour, with panels, arches, mouldings, flush bands, &c., in red, the colour of Corsehill stone. I also wish to execute some parts in sgraffito, the raised parts being buff, and the sunk red or black. Earth colours will, I believe, weaken the cement, and are, therefore, objectionable. I am also of opinion that pounded stone, brick, or terra-cotta, if used in sufficient quantities to produce the colours, will weaken the cement too much. I have specified that the colours are to be worked in the finishing coat, but am thinking that perhaps liquid colours might be successfully applied on the surface whilst the cement is wet. I shall be glad of any information on the subject both with regard to the manner of working and the materials to be used to produce the required tints.—W. G. D.

[5964.]—**Glazed Roofs.**—What is the best and cheapest system of glazing for roofs of ∧ shape, with a continuous ridge through the centre?—James Cocker.

[5965.]—**Basement Lights.**—What kind of light for basement is best, combining ventilation, cost being considered?—James Cocker.

[5966.]—**Dilapidations.**—Will your contributor, Mr. B. Fletcher, kindly tell me the meaning of the following terms, made use of in his articles on "Dilapidations"—viz., fee simple, fee tail, tenant by elegit, statute merchant or staple, tenants in tail, coparcenexo, corporcal heredit, usufructuary, disherison, and estovers, or refer me to a good book where such terms are explained?—Student.

[5967.]—**Outlet for Heated Air.**—Will some of your readers kindly say whetner in the case of heated air escaping into the roof it is necessary that there should be outlet aperture at both ends of the same, or will one do if it is impossible to get both? Also, is it usual to have a longitudinal tube in the roof to carry off the heated air or to allow the air to get into the roof merely and escape by vents provided at the gables?—Enquirer.

[5968.]—**Red Tiles.**—Mr. George M. Barry says, in his report on "Bricklaying at Paris Exhibition, 1878," published in your paper of 21st inst., at p. 600, "Red tiles of firm quality are about 40s., while Bourgogne tiles range to 84s." Will he kindly say what sizes the respective tiles are, and for what purposes used? I presume the prices of 40s. and 84s. are per 1,000 in Paris.—J. M. G.

REPLIES.

[5922.]—**A Family Profession.**—"W. G.'s" question was answered with such concise clearness in your issue for Nov. 7th, by Mr. John J. Cole, that it is almost superfluous to say more. It may, however, be as well to add that not only does the "Parentalia" state most clearly that old Strong carried out the masonry at St. Paul's Cathedral, but other authorities may also be cited substantiating the same. In "Notes and Queries" for the current week (p. 420) it is mentioned that Dean Milman, in his "Annals of St. Paul's," states (2nd edition, p. 401) that Wren himself laid the first stone of the cathedral on June 21st, 1675, without any ceremony whatever, and (p. 410) that "Strong, his master mason, assisted in laying the first stone, and in fixing the last in the lantern." "W. G." is to be thanked for his query, as it has undoubtedly afforded additional opportunities for proving, in a very satisfactory manner, an interesting circumstance. There can be little doubt but that the finest Portland-stone job in Christendom, although it took 35 years to erect, owes no little of its undoubted success to the fact that the stonework throughout was hewn and fixed under the active practical superintendence of one man—Strong, the master mason.—Haray Hems.

[5947.]—**Illicit Commissions.**—I have also seen and read the documents referred to by "Kappa," and entirely share his sentiments. Your readers who may be interested in the matter will find it difficult to get copies of the documents, as they have only been privately printed for the Common Councilmen, but many of them have probably read an article which appeared in the *Echo* of Friday last, which gave an abstract. Several letters on the subject have since appeared in the same journal, and on Monday the matter came before the Court of Common Council, but no definite result was arrived at. Whatever the Court of Common Council may do—and my own opinion is it will do precious little—it can only deal with its own servants, but it does certainly seem to be the duty of the R.I.B.A. to take the matter up and strengthen the hands of reformers like Sir Edmund Beckett and Mr. J. S. Storr, who have been working for a long time past in connection with it. I hear the Estates Exchange are going to move in the desired direction, and I have some faint hopes of similar action on the part of the Institute of Surveyors.—F. de R.

[5949.]—**Estimating Cost of Buildings.**—To "Young Architect's" query, I may say that no information he may receive on the point asked will be of use to him. He must gain his experience in the same way that "Old Architects" have done before him. The price per cube foot wherewith to estimate, would to him be a mere shot or guess-work only. Where one has built several town-halls, churches, or houses, a comparison of their respective costs may be of some use as a guide in similar cases, but a very rough approximation even at the best, and useless, without fully obtaining particulars of value of materials on the spot, and labour, &c. There is one great mischief at the bottom of cube pricing, that it furnishes what many reckless architects are only too glad to have—viz., a plausible excuse for deceptive estimation. What is more common than to hear when the usual 70 per cent. excess arises—"Oh, I put it at 6d. (say) per foot, and scores of buildings have been built at that figure"?—B.

[5949.] — **Estimating Cost of Buildings.** — If "Young Architect" desires to estimate his designs by cubing, he must be particular to fix upon a just unit of cost or price per foot. For churches the cubing may vary from 7d. to 10d. or 1s. a foot cube. Municipal buildings are generally cubed at about 8d. to 10d.; the latter price is not too high for complicated buildings. Pricing, however, by this means cannot be relied upon unless one knows the cost per foot of executed buildings of the kind required. For instance, without particulars or seeing the design of the church, I cannot give "Young Architect" the price per foot that would be reliable for calculation, as the price depends mainly upon the accommodation or size, whether the church has galleries or not, tower or spire, and what kind of detail and finish it has, the materials used, &c.—G. H. G.

[5950.] — **Stable Floor.** — One of the best stable floors I have seen was made from a new brick, buff colour, which I believe is made by the Marland Brick and Tile Co., Torrington, Devon. It seems to be a much superior brick to many others, and does not appear to be slippery.—E. H.

[5950.]—**Stable Floor.**—I think "Alpha" will find that there is nothing better for flooring of stables than real Dutch clinkers. Those with the beveled edge are the best, and should be laid on edge on a bed of concrete and jointed in cement. There are, I believe, imitation Dutch clinkers made in Staffordshire, but they are neither so hard or rough on face.—W. H. Veysey.

[5950.]—**Stable Floor.**—The best paving for stables where very hard wear is given is granite cubes about 4in., blue Staffordshire bricks, either plain, grooved, or chamfered. Adamantine clinkers or Dutch clinkers are also excellent. Buckley bricks are not used in London, but from samples of the curbing and fire-bricks which I have seen in use in Mold and its neighbourhood, I should say they would make excellent paving, equal to either of the foregoing, and if chamfered or well grouted in cement would not chip. Cement will make a very good floor if laid as dry as it can be worked and watered every day for about three weeks or a month before being used. If this cannot be done, it will not stand.—T. E. Julian.

[5950.]—**Stable Floors.**—In reply to "Alpha," in your paper of Saturday last, the metalline paving bricks, made by the Buckley Brick Company, will turn the edge of a well-tempered chisel, and I should say no horse's hoof would chip them. Cement would no doubt make a very nice-looking floor, but would probably become slippery, and, moreover, is very difficult to mend or patch if ever required.—Corcipa.

[5954.]—**Clay-Grinding Machinery.**—It is impossible to answer the above at all satisfactorily without knowing more fully the particulars of the requirements of "M. R.," and indeed clays vary so much in different localities that no one could answer such questions without seeing the place and having much more full information. If "M. R." will advertise his full address I dare say he will get plenty of offers of advice.—Brickmaker.

[5954.] — **Clay-Grinding and Brickmaking Machinery.**—If "M. R." will let me have his address I will send him particulars of patent steam brickmaking and pressing machines capable of making from 1,400 to 1,500 bricks per hour.—G. G., 20, Newlands-street, Derby.

* * *

The whole of the mains and most of the branch connections for the water-supply of the new district at Huntley, N.B., were laid last week. In place of the fire-plugs, with which the rest of the town is fitted, the new quarter is provided with patent ball hydrants, and these were tested with success on Saturday. The contractor is Mr. Alexander, of Keith.

LEGAL INTELLIGENCE.

Caution to Architects.—At the Shoreditch County-court, on the 25th inst., Mr. A. R. Brede, of 39, Great James-street, W. C., architect, sued Mr. Edward Dickens, of 28, Great Cambridge-street, E., wholesale bootmaker, for £13 11s. for survey, preliminary sketches, and for preparing contract, drawings, specification, and for copies of same for new workshops, being the customary charges, at the rate of 2½ per cent. on estimated cost. Mr. W. H. Hargrave appeared for the plaintiff and Mr. Metcalfe appeared for the defendant. The plaintiff stated that he received instructions to survey premises and prepare drawings and specification for new workshops; such drawings and specification were prepared and supplied to the defendant in October, 1878. The defendant, unknown to plaintiff, obtained tenders from several builders in the spring of this year. The lowest tender was not accepted, although under plaintiff's estimate. The defendant did not have his works erected according to the specification, and did not employ plaintiff to superintend the works. The plaintiff, by his solicitor, contended that he was entitled to 2½ per cent. upon the estimated cost of the buildings, as being the customary charges and according to the scale of the R.I.B.A., for making drawings, specifications, &c. Mr. Shoobert and Mr. Fowler, architects, gave evidence as to the fairness of plaintiff's charges. On behalf of the defendant it was contended that he had only used the drawings and not the specification for the actual erection of his workshops; a specification having been supplied by the builder who was employed to erect the buildings, at a lower cost than plaintiff's estimate, and the tenders of builders who had estimated according to plaintiff's specification; and that he, the defendant, was only liable for the drawings. The judge accepted this view of the case—verdict for the plaintiff for £4 4s. and costs. Notice of appeal given by plaintiff.

The Sheffield Patent Brick Co., Limited, v. Wade.—This originally was an action brought against George Wade, of Suffolk-road, Sheffield, builder, by Mr. Wm. Wing, liquidator of the Sheffield Patent Brick Company, Limited, to recover the sum of £111 15s. 6d., being for bricks supplied to Mr. Wade, to be used by him in the erection of St. Wilfrid's Schools, St. Mary's-road, Heeley, of which he was the builder. Mr. Wade admitted that he was indebted to the company in the sum mentioned, but he claimed damages from them on account of a great quantity of the bricks with which they had supplied him turning out defective on being exposed to the weather, after having been placed in the building, in consequence of which Mr. Wade was compelled by the architects (Messrs. M. E. Hadfield and Son) to cut out the defective bricks, and in so doing he expended £600 or thereabouts, and he claimed this amount from the company. The action was referred to Mr. William Smith, solicitor, by the consent of the solicitors on both sides. Mr. W. Smith sat as arbitrator at the Law Society's Rooms, on the 31st day of October, and on the 1st and 10th days of November. Mr. William Smith published his awards on the 19th inst., by which he awarded and adjudged that Mr. Wade should pay to Mr. Wm. Wing the sum of £111 15s. 6d. according to the particulars endorsed upon the writ in this action, and he also awarded and adjudged that a great quantity of the bricks supplied by the Sheffield Patent Brick Company, Limited, to Mr. Wade being of a bad and inferior description to those agreed to be supplied, and that in consequence Mr. Wade had sustained damage to the amount of £450, which sum Mr. Wing was directed to pay Mr. Wade, together with the cost of reference and award. The costs of the action follow the event.

CHIPS.

A meeting is to be held on Tuesday, December 2nd, at the Liverpool Free Library, to promote the memorial against the restoration of St. Mark's, Venice. A paper by Mr. William Morris will be read, and the meeting will be addressed by the Rev. S. Fletcher Williams, Mr. Hall Canie, and others.

Messrs. E. P. and W. Baldwin, of Stourport, have just been awarded a gold medal for sheet iron and tin plates at the Exposition Internationale de 1879, Sciences Appliques a l'Industrie, Paris, the only gold medal awarded to an English house in this department.

Two lattice girder bridges have just been completed at Llanfairfechan, North Wales, in place of two destroyed by the recent floods. The work has been carried out by Mr. H. G. Brown, of Smithdown-lane, from designs, and under the superintendence of, Mr. G. H. Thomas, architect, Lord-street, Liverpool.

Four new churches at Barrow-in-Furness, dedicated to the Evangelists, and erected at a cost of £24,000, were consecrated by the Bishop of Carlisle on Saturday.

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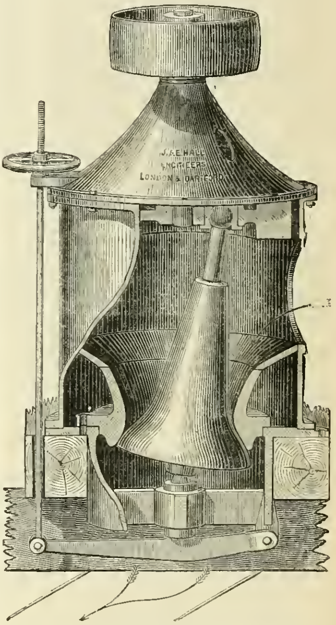

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Our Office Table.

An extension of the Metropolitan Railway from West Hampstead to the present terminus at Walm-lane, Willesden, was opened on Monday. The railway is intended to be carried forward to Harrow, which is distant about five miles from Willesden; and ultimately to Rickmansworth and Watford. The gradient from the West Hampstead station rises 1 in 100 till it crosses the North-Western Railway at Brondesbury, where a viaduct about half a mile long carries the line till it goes over the Edgware-road into the Kilburn and Brondesbury station, the fall being 1 in 100 into it. All the bridges cross the streets on the skew, and two are exceptionally large—one being 104ft. span over Iveson-road, and the other 87ft. over Loveridge-road. The bridge across the North-Western is by girder, a large span of 66ft., and there is a double road—two roads of two lines each. Over Edgware-road and Christ Church-road are cast-iron arches. The rails are steel, 86lb. to the yard, and the chairs are of cast-iron, 39lb. each, fixed with oak keys; the sleepers being 9ft. long, 12in. by 6in. on cross sections, and 2ft. 8in. from centre to centre. The works were commenced in April, 1878, and have been carried out by Mr. Joseph Firbank, the contractor, upon the plans of Mr. Charles Liddell, the consulting engineer of the Metropolitan Railway Company. Mr. A. Macdermott is the architect for the stations. The locks and door furniture for the stations throughout were supplied, according to the architect's specification, by Mr. James Hill, of Upper Thames-street.

Last year we noticed, for the first time, the very useful architects' and builders' diaries, introduced by Messrs. Hudson and Kearns. We have used them ourselves throughout the year with much satisfaction, and are glad now to draw attention to the new batch sent us for 1880. The original and extremely useful feature of these diaries is, that each volume forms in itself a complete set of books indexed and paged throughout. Nos. 12 and 13 are specially ruled and printed for the use of architects and surveyors, and contain not only a diary, which is virtually a journal or day-book, but a cash-book and ledger, a note-book, and rent and insurance registers, and indeed comprehend all that is required for ordinary professional use, for the record of the year's transactions. The diary intended for the use of builders has a very good series of tables, and a capital bill-register both for bills payable and receivable.

On Sunday afternoon the temporary collection of paintings, in the ward of Aldersgate, in the city of London, which has been exhibited for the last four Sundays, was open for the last time. Subsequently the committee of the Sunday Society met, and passed a resolution to the effect that the success which had attended the experiment had conclusively shown that there were large numbers of persons in London desirous of taking advantage of any opportunities for intellectual recreation which might be provided in the City on Sundays; and that, as no such opportunities at present existed (the Guildhall Library and Museum being still closed to the public on Sundays), one of the City companies should be asked to grant the use of a hall for the exhibition of another temporary collection of works of art on Sunday afternoon.

Mr. Thomas Merrick, who died, after a brief illness, of bronchitis, on the 11th inst., at his residence, East-street, Hereford, had for many years carried on the business of a cabinet-maker in that town. His skill as an ecclesiastical carver in wood gained him a reputation throughout the diocese of Hereford and the Principality. The first piece of ecclesiastical carving of any note in which he was engaged was in connection with the restoration of Hereford Cathedral, commenced in 1840. About four years ago he had an important job to repair and renew the woodwork generally of a church in North Wales, under Sir Gilbert Scott. From there he went to Chester Cathedral, where he was engaged for same little time. Among his more recent works we may mention—Mansell Gammage Church, where, under Mr. Lewis Powell, architect, of Hereford, he did the pulpit, desk, desk-seat, and lectern. Shortly after that he did five carved seats for Holme Lacy Church. He also did the Madley desk and pulpit, under Mr. Powell, and at the time of his death he was engaged on a lectern for Madley. His last finished work was a pulpit just erected in Breinton Church. Mr. Merrick was 61 years of age.

Momus, a Manchester satirical weekly, in its issue of Nov. 20, gives a portrait and memoir of "Elijer Goff," better known, perhaps, to our own readers and architects generally as Mr. William Dawes. We extract the following:—"Mr. Dawes' first contribution to the press was a critique on Charles Kean's acting in Louis XI. in the year 1857. His first book, 'Elijer Goff's Trubbles, Travels, and other Amoozements,' appeared in the spring of 1872, and ran through three editions. His second book, 'Elijer Goff's Kristmus Book,' followed in the winter of that year. His third book, 'Elijer Goff's Kronikle of a King,' which has run through two editions of 5,000 each, was not published until last year, owing to a long and severe pressure of professional work in the years 1873 to 1878, during which period his time was fully occupied with the Victoria Buildings and other important works. Mr. Dawes has another volume ready for the press, and it will shortly be published. It has a Satanic title, and will no doubt have a large sale."

Mr. E. Buckham, A.I.C.E., borough surveyor of Ipswich, has made a report to a committee of the Town Council on the relative advantages of steam and horse rolling. He tabulates the answers received from thirty towns where steam-rollers are used, and shows that they possess the advantages of economy, facility for perfect construction, less inconvenience to the public, &c., as the roads are more expeditiously repaired, comfort to persons travelling, greater consolidating power, and that roads can be equally well made at any time of the year, together with the indirect saving afforded by the improved road surface on the wear and tear in horses and vehicles. The direct saving in cost of steam over horse-rolling is indefinitely given, the balance of opinion being from 25 to 33 per cent. in favour of the steam-roller. The paving and lighting committee of Ipswich have decided, after considering the report, to purchase a 10-ton roller.

The decision of Mr. Justice Fry in the case of Moody *v.* Steggles, the *Pall Mall Gazette* says, carries the doctrine of the law of easements further than it has hitherto been carried by any tribunal in this country, and should warn owners of property to be careful how they grant conveniences to their neighbours. Mr. Justice Fry decided that where a signboard had been hung upon a house for the convenience of an inn which stood next to it, and in a less favourable position for exhibiting the sign in question, this created the relationship of a dominant and a servient tenement between the two houses. Thus, the right to hang his sign on the next house—a perpetual easement, in fact—became vested in the owner of the inn, whether the possessor of the servient house was willing or not. It is clear that the principle which supports this right may apply to various other kinds of accommodations between owners of urban houses, which may equally become burdensome easements in perpetuity.

The 52nd election of pensioners on the funds of the Builders' Benevolent Institution took place on Thursday week, at Willis's Rooms, St. James's; Mr. F. J. Dove, president, in the chair. There were five vacancies—three for men and two for women; and eleven candidates—four men and seven women. The poll was opened at noon, and closed at 3 p.m., when the scrutineers, Messrs. Thos. Stirling and T. F. Rider, reported the results of voting to be as follows:—William George Gadsby, aged 69, 2,921; Jeremiah Bromley, aged 68, a subscriber to the Institution for 13 years (second application), 2,480; Joseph Cable, aged 60, a subscriber to the Institution for several years, 1,883; William Charles Read, aged 66, 880; Elizabeth Starkey, aged 66 (widow of James Starkey), 3,885; Harriet Mary Gilder, aged 63 (widow of Francis Gilder), 2,680; Elizabeth Davis Stenteford, aged 60 (widow of John Blatchford Stenteford), 1,800; Mary Ann Hibberd (second application), aged 64 (widow of Daniel Hibberd), 1297; Mary Ann Garner, aged 64 (widow of William Garner, who subscribed to the Institution for eight years), 857; Selina Thomas, aged 72 (widow of Charles Thomas), 250; and Annie Boulton, aged 60 (widow of Webber N. Boulton), 159. The Chairman therefore declared the successful candidates to be—W. G. Gadsby, J. Bromley, J. Cable, Mrs. Starkey, and Mrs. Gilder. Mr. Simpson, on behalf of the committee, expressed regret that the whole of the candidates could not be elected, and on the motion of Mr. J. W. Scrivener, seconded by Mr. E. V. New, votes of thanks were tendered to the scrutineers and chairman for their services.

HELLIWELL'S Patented **NEW SYSTEM**
IMPERISHABLE GLAZING WITHOUT PUTTY.
As ADOPTED by H.R.H. the PRINCE of WALES at Sandringham.
All Woodwork is covered, and no outside Painting is required. Old Roofs Re-glazed. Any one can repair or take in pieces.
See half-page Advt. in next Number.
T. W. HELLIWELL, Brighouse, Yorkshire; or, 19, Parliament-street, London.—[Advt.]

A new organ, built by Messrs. T. C. Lewis and Co., of Brixton, was opened in the parish-church of Leiston, East Suffolk, on Sunday.

MOULE'S
PATENT EARTH CLOSETS.
EARTH-CLOSETS—ASH-CLOSETS,
ON AN IMPROVED PRINCIPLE, ARE NOW MANUFACTURED AND SOLD BY
MOULE'S PATENT EARTH-CLOSET COMPANY, LIMITED,
5a, Garrick-street, Covent Garden, London.

CHIPS.

New cottages for workmen employed by Messrs. Ferguson Brothers, at Holme Head Works, Carlisle, are about to be commenced. The contract has been let to Mr. George Black for the whole of the works. They are to be erected from plans prepared by Messrs. Hetherington and Oliver, architects, Carlisle.

Extensive coal, quarry, and other offices have just been erected on the estate of Mr. J. Pickup, Entwistle, near Darwen, from the designs of Messrs. Mellor and Sutton, of Liverpool. The style is French Gothic, and the contractors are Messrs. Lloyd and Millward, of Darwen.

The parish-church of Stradbroke, Suffolk, was recently reopened after restoration of the 14th-century chancel, effected at a cost of £700, at the expense of the rector, the Rev. J. C. Ryle. A lofty open roof replaced a plastered ceiling; a large east window has been inserted, new reredos, Communion-rail, and altar provided, Minton's encaustic tiles, figured with the rose and portcullis, have been laid in the passages. The nave, aisles, and west tower, which are of the Perpendicular period, were restored a short time previously at a cost of £5,000.

The West Sussex, East Hants, and Chichester infirmary is about to be extended from the designs of Messrs. Waller and Son, which were adopted at the annual meeting held last week.

The *Carlisle Journal* states that during the past five years the building trade has been very prosperous in that city in supplying the urgent need that existed for artisans' dwellings. Since 1875, about a thousand houses and shops have been erected in Carlisle, of which some 140 were for the professional and upper middle classes, but the great majority have provided accommodation for workmen, and have been erected at Denton Holme and in Botchergate. Rents are now easier than they were three or four years since, yet a steady demand for a good class of cottages testifies to the continued general prosperity of the city.

The local board of Dwgyfylchi are about to carry out over 4,000 lineal yards of sewerage in the district of Penmaenmawr, from the designs and plans of Mr. John Farrar, C.E., of Bury, Lancashire, and under the superintendence of Mr. Jones, their surveyor.

A new public hall, erected by subscription, was opened at Brockley, S.E., on Tuesday. St. Peter's Hall, as the new building will be called, is semi-Gothic in character, and has a large meeting-room accommodating 400 persons, six class-rooms, and the usual offices. Mr. J. O. Abbott, of Breakopen-road, Brockley, is the honorary architect of the building, which has cost, for erection and furnishing about £2,800.

The annual distribution of prizes at the Weymouth School of Art took place on Monday week. The report showed that 110 students had attended the school during the year, as against 105 in the previous twelve months. Eighty students sent 650 works to South Kensington for examination, of which one obtained a third-grade prize. In the second-grade examination fifteen students were successful, obtaining seventeen passes and four excellents. Painting on china, glazed and unglazed, is to be taught in the classes this year, and science classes have also been started.

Christ Church, Crowborough Cross, Sussex, erected from the designs of Messrs. Satchell and Edwards, 37, Norfolk-street, Strand, was consecrated on the 11th November.

The Local Board of Llanfrechfa are about to carry out works of sewerage in the district, at an estimated cost of £2,100, the sanction of the Local Government Board having been granted for borrowing the sum required.

A new outfall sewer is being constructed at Sandown, Isle of Wight, for the Local Board. The contractor is Mr, Heyden, and the total cost will be about £4,200.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. Opening meeting, 8 p.m.
Society of Arts. Dr. Graham on "Breadmaking." 2nd Cantor lecture. 8 p.m.
Society of Engineers. 8 p.m.
WEDNESDAY.—Society of Arts. 8 p.m.
FRIDAY.—Architectural Association Conversazione. 8 p.m.

Lamplough's Pyretic Saline is Refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALLPOX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[ADVT.]

Holloway's Ointment, aided by his Pills, presents the only rational mode of curing pimples boils, carbuncles, abscesses, and disfiguring diseases. Tainted blood, the fountain of these evils, is thoroughly purified by the Pills, and its evidences on the surface are effectually eradicated by the unguent without pain or danger —[ADVT.]

Trade News.

WAGES MOVEMENTS.

CARDIFF.—Notice having been given by the master builders of Cardiff to their workmen that the existing rules are to undergo alteration, it is understood a reduction of wages is contemplated.

POTTERIES.—Lord Hatherton, the umpire in the arbitration on the question of a reduction of potters' wages ten per cent., has sent in his award. He has decided in favour of a reduction of wages to the amount of 1s. 8d. in the pound—rather less than 10 per cent,—and in his award he says he considers the trade of the staple manufactures of the district was depressed to such an extent as to equire some reduction in the cost of production, and that it had been proved to him that there were no means of obtaining this result by more economical arrangements, or by obtaining the raw materials at a less cost: neither was it possible to increase the selling prices while trade was in its present state.

SEASONED BATH STONE
150,000 feet cube of
DRY CORSHAM.
Largest Stack ever seen.
PICTOR & SONS, Box, Wilts. [ADVT

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
Agent: Mr. E. CRICKMAY, 4, Agar-street, London, W.C.—[ADVT.]

Superior Vitrified Blue Goods, Quarries, Ridge Tiles of all descriptions.
Glazed Stoneware, Socketed Drain Pipes, &c,
PRICES ON APPLICATION TO
BROADBENT & CO., Chief Offices, Leicester, Manufacturers and Merchants.—[ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BARMOUTH.—For sewerage works, for the Barmouth Local Board :—

Jeffreys, R., Colwyn Bay	£3,636	6	10
Beardsill, Chas., Tremadoc ...	3,363	9	2
Hughes, H. Portmadoc	2,800	0	0
Owen, S. (accepted)...	2,250	0	0
Bugbird, Thos., Carnarvon ...	2,102	10	0
Morgan, H. and Co., Dolgelly ...	1,850	0	0

BETHNAL GREEN.—For eight cottages at Gales Gardens. Messrs. A. and C. Harston, architects, 15, Leadenhall-street, E.C. :—

Johnson (accepted)...	£2,800	0	0

BETHNAL GREEN.—For new stoker's rooms, baths, &c., at the workhouse, Bishops-road, for the Guardians of St. Matthew, Bethnal-green. Messrs. A. and C. Harston, architects, 15, Leadenhall-street, E.C. :—

Somerville	£1,059	0	0
Palmer...	820	0	0
Smith	780	0	0
Body	750	0	0
Johnson	747	0	0
Thomason	695	0	0
Parrish...	620	0	0
Derby (accepted)	586	0	0
Haines, H.	568	0	0

COLWYN BAY, WALES.—For the erection of a new school and house at Llwdgued, for the Colwyn Bay School Board :—

Roberts, A., Llandudno (accepted)...	£800	0	0

[Lowest of seven tenders received.]

DARENTH, KENT.—For engineering works, comprising boilers, engine, pumps, and laundry machinery, at the Asylum for Imbeciles, for the Managers of the Metropolitan Asylum District. Messrs. A. and C. Harston, architects, 15, Leadenhall-street, E.C. :—

Duncan, Steward, and Co.... ...	£9,600	0	0
Clayton, Howlet, and Venables ...	9,150	0	0
Williams, R. and Sons	7,281	0	0
Coles, H. J.	6,921	0	0
Hunt, T. and Sons	6,170	15	0
Green, T. and Sons	5,900	0	0
Benham and Sons	5,460	0	0
Bunnett and Co.	5,447	10	0
Fraser, Bros.	5,395	0	0
May, J. and F.	5,360	0	0
Clements and Co.	5,000	0	0
Bradford and Co.	4,995	0	0
Siebe, Gorman, and Co.	4,900	0	0
Clark, J. F.	4,725	0	0
Bushby, Thos...	4,578	0	0
Mason, F. S.	4,491	0	0
Vigor, F. G. and R....	4,397	0	0
Lowcock, A.	4,250	0	0

GLOUCESTER.—For the construction of a new bridge and sewer in Park-end-road, for the Town Council :—

Meredith, J., Gloucester (accepted)	£265	14	2½

[Lowest of ten tenders received, of which the highest was that of Mr. W. Coker, of Luton, £425 2s.]

GLOUCESTER.—For the extension of New-street, for the Town Council :—

Meredith, J., Gloucester (accepted)	233	14	17

[Lowest of ten tenders received, of which the highest was that of Messrs. Braddock and Matthews, of Stockport, £434 13s. 4d.]

GLOUCESTER.—For the repair of a private street, known as Windmill Parade, for the Town Council :—

Meredith, J., Gloucester (accepted)	£165	7	4

HASTINGS.—For addition to Manor House, West Hill, Hastings. Mr. W. H. Murray, architect :—

Harman, C. and E....	£1,147	0	0
Shortell and Co.	1,110	0	0
Vidler, A.	1,085	0	0

HOLLINGTON.—For St. John's Vicarage, Hollington, near Hastings. Mr. W. Hanley Lloyd, architect, Birmingham :—

Woodall, T., St. Leonard's ...	£2,599	0	0
Vidler, A., Hastings	2,158	0	0
Ashdown, H., Hollington... ...	2,046	0	0
Rodda, W. J., St. Leonard's ...	2,000	0	0
Cruttenden, F.	1,990	0	0

LEEDS.—For municipal offices, Leeds. Mr. George Corson, architect, Leeds :—

Wood, J., Leeds (accepted) ...	£53,000	0	0

[Two other tenders received for £76,951 11s. 6d. and £49,844 6s. 2½d.]

THE SILICATE PAINT COMPANY,
FLETCHER, BERDOE, & ORR, Proprietors,
"CHARLTON PAINT WORKS," CHARLTON [BY WOOLWICH], KENT,
PATENTEES AND SOLE MANUFACTURERS OF THE
"CHARLTON" NON-POISONOUS PAINTS AND COLOURS,
For HOUSE and SHIP PAINTING, PAPER STAINING, &c.

The extensive works of the Company, on the Banks of the Thames, have been greatly enlarged and remodelled under new management, and in future the
QUALITY OF ALL GOODS WILL BE GUARANTEED.
Sanitary Science, impatient of the deleterious substances hitherto in use, called loudly for Non-Poisonous Paints and Colours, and the inauguration of these Works is the response to that demand,
NO POISONOUS INGREDIENTS BEING USED IN THEIR MANUFACTURE.
The Company's products are now largely used at home and abroad by Government Establishments, Dockyards, Arsenals, Railway and Shipping Companies, Public Institutions, School Boards, Hospitals, &c., and wherever the laws of health and economy are studied. Their comparatively low price allows of the Silicate Paints and Colours being used for the commonest as well as for the highest class of decorative work.

New Descriptive Lists and Pattern Cards are now ready, and may be had, gratis, on application as above, or to the Company's Offices and Depots,
LONDON: 107, CANNON STREET. LIVERPOOL: 32, SEEL STREET. GLASGOW: 21, HOPE STREET.

THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 5, 1879.

THE MARBLE MARKET OF EUROPE.

THE extraordinary demand for Italian marble which of recent years has grown up in the United States, has raised a question in the Peninsula, similar to that which agitated the United Kingdom a few years ago with reference to its coal-fields—how long are the quarries likely to hold out against a consumption thus universal and increasing? It may be said, literally, that they send their supplies to all the civilised world—the more civilised the larger the request for this, the purest of human luxuries. It may very well be that other regions, and America especially, produce what are termed marbles in beautiful and almost countless varieties; but, the Grecian quarries excepted, the Italians have practically no rivals in furnishing the material of sculpture, and it is well known that for a considerable period past the Greek rocks at Pentelicus, Paros, and elsewhere have been hewn down—the former, however, less so than the latter—as it were to their very roots. Elsewhere, throughout the New World—in the States, in Peru, and Mexico, in the capitals of the small republics—wherever, indeed, modern magnificence in the North has outrivalled ancient splendour in the South, are to be found superb flights of steps, colonnades, altars, mantelpieces, cornices, and so forth, of "native marble"; yet, would Hiram Power, or any other artist, have ventured to work upon any of it, however brilliant, for the purposes of his studio? The answer is given in the continual importations to which allusion has been made, and not the Italian quarry-owners merely, but the Italian Government also, are naturally anxious to ascertain whether there appear to be any probable or near limits to this historic source of the national wealth. We are assisted, indeed, in the consideration of the subject by several reports which have been addressed to the Minister in charge of interests belonging to this class, as well as by details in the columns of the journal more especially representing them. In vain has the earth been searched for new beds wherefrom may be chiselled statues such as those that are the glory of the temples and palaces of antique Greece and Rome. They seem to have no existence. A superabundance is ready at hand for balconies, balustrades, church-fonts, pulpits, consoles, cloister decorations, "credence, cross, and cave," for pavements, fountains, mosaics of the nineteenth-century kind, tombs, vases, and all else and sundry of the miscellanea entering into the necessities of public and private ornamentation in our day; and, even were these supplies to wholly or partially fail, the art of imitation has been carried so far that the failure would scarcely be felt. Already is "artificial marble" extensively employed in the building of Italian churches. A patriotic instinct led those who reared the Column of July, in Paris, to seek their materials in the native quarries of Franchemont, while some inferior French sculptors have directed their choice of necessity to those of Gabas, which really yield a perfectly white and exquisite stone, possessing, however, few of the qualities which gave a kind of mundane immortality to the works of Phidias and Praxiteles. There are marble quarries, moreover, in Belgium—largely productive, and contributing much to the architecture in the newer quarters of the Belgian towns, as there are, indeed, in our own island of Anglesea, though the designation bestowed upon them is somewhat ambitious. Those near Vichy are, in many respects, not far removed from the true Italian, but have rarely found their way into the studio; while the splendid specimens in the Napoleonic Hospital, at Berck-sur-Mer, were derived from a number of localities, the precise names of which have not been put upon record. In southern France, again, as at Toulouse, endeavours were made a century ago to utilise, for the higher purposes of art, the produce of the local quarries; but the idea had to be abandoned. There is no second Pentelicus, no new Carrara, to be hoped for. With respect to Greece, there is little reason to doubt that her riches of this description, although the classic quarries may have been nearly wrought out, are far from being as yet exhausted; they are simply neglected, and, according to the French Geological Survey, conducted by M. Albert Gaudry, the plain of Pentelicus still rests upon a bed of such marble as that of which the Parthenon, the Temple of Theseus, and the other glories of the Acropolis were constructed. The old quarrymen, in some places, scarcely did more than scratch the face of a naturally scarped hill rising on the edge of the main level, extracting a block here and a block there, to satisfy some exigency of their employers, an entire excavation not unfrequently representing no more than a solitary monolith extracted. Often, too, having half-accomplished their work, they discovered a flaw, and abandoned it. Many of these rejected fragments, we are told, remain to this day, partly hewn, and partly clinging to the parent rock. Though this rock may yet be seen the hollowed way down which the marble was transported to the workshop of the architect. or the studio of the sculptor. M. Gaudry found, there, an enormous drum, of the purest material, evidently designed to form part of a column for some mighty edifice, but which never had been removed from the place where the quarrymen had left it. On the other hand, wanton and barbarous requisitions were made here to supply materials for the Palace of Otho, late King of Greece, and for other pretentious edifices, belonging to his reign in modern Athens. The Turks, too, left marks of their ravage on Pentelicus. Nevertheless, if the report of the French Geological Commission be not exaggerated, there yet remains a considerable surface and depth of the true Pentelican marble unworked—excellent news for artists, should the statement be verified; but no exact measurements are given, and no statistics whatever. The Pentelicus of the year—a very recent one—in which M. Gaudry visited it, was in process of being hewn to fragments by speculative builders from the capital.

At Carrara there is, at least, more method observed in the devouring process, but it is none the less exhausting. A little community of sculptors is established round the quarries, the work of the artist's chisel goes on within a few yards of the marble-mason's saw; statues, bas-reliefs, capitals, and columns are perpetually being turned forth at a rate which unquestionably threatens that the supply will be of no very protracted duration. An absolute reign of waste appears to have been established in this domain of marble. A late traveller was assured on the spot that hundreds of tons annually were needlessly thrown away in needless chipping and superfluous dust. Besides this, valuable blocks are, every now and then, ruined by the clumsiness of the workmen, or, at any rate, have to be cut up into smaller, and, therefore, less valuable, fragments, so that a supply which might last indefinitely is recklessly consumed without the remotest reference to the future, and only in the prospect of immediate gain. Marvellous, however, must have been the wealth of this narrow region in one particular material, when it is considered that this war, so to speak, upon the rock has been going on, almost without intermission, since the days of the Roman Empire, though that there was a gap historians are agreed, and the neighbouring ruins attest. Yet, when it is remembered that Canova the Venetian, and Thorwaldsen the Dane, received their artistic education within sight of these quarries, a greater wonder is that they are not more sedulously cared for, or, in a sense, "preserved." But the material whence the Venus of Milo and that of Medici, the Antinous, the Bacchus, and the Mercury, which have been the delight of ages were fashioned, is now actually sold by the hundredweight and ton as though it were no more priceless than the mock alabaster is, of Volterra. One deplorable circumstance is that so much of it is removed, in colossal masses, for the decoration of commonplace, albeit, gorgeous edifices of the nineteenth century, with the result that what might have furnished the principal splendour of a gallery at Rome or Florence, may serve as the pavement of a vulgar vestibule, or the coping-stone of a wall. The Italians themselves are beginning to become sensible to this reproach, at once upon their national spirit and their reputation for foresight The Carrara Quarries once exhausted, or near exhaustion, and a large money-spending colony will quit their shores. It is a sort of opulence which cannot be renewed. There are other marble rocks in the vicinity, it is true, as that, for instance, of Colonnata; but the Colonnata quarries have never been held in equal, or even similar, esteem, and will not serve as a refuge to fly to when the "crystalline white," once so abundant in their neighbourhood, has disappeared. Not a few of the rocks, it should be remarked, have already ceased to yield the material of statuary, while, although the huge calcareous masses, rising in every direction around, appear to promise an unbounded store for the future, it is well-known that they may be pierced far and wide—a certain Vandal once suggested blasting—without a bed of the pure, veinless, almost imperishable, sculptor's marble being found. About £50 a cubic yard is considered an average price, apart from the cost of quarrying and transport; but it is not surprising that the tariff rises from year to year. An illustration is afforded, close by, at Palvaccio—once famous, now absolutely desolate. The marble there was literally blown out of its bed by gunpowder, five or six mines being exploded at a time, until a multitude of formless masses almost choked the valley, and the practice, monstrous though it be, is not unknown at Carrara itself, or in the contiguous quarries of Seravazza. It may be a long time, of course, before the world is compelled to put up with the French invention of "artificial marble," which is no more than a species of stucco, although, as we have said, it meets with considerable acceptance among modern Italian church-builders, who pretend that they can quote precedents from the Basilica of St. Lawrence, Saint-Etienne-le-Rond, at Rome, the Ara-Cœli, Saint Martin of the Mountains, and the Church of the Four Crowned Saints; but in these the term is a misnomer, applied to work of a totally different kind, being used merely for incrustation, where surfaces have to be concealed. It is much more to the purpose to know that the merchant-princes of Holland, a country almost destitute of stone, and wholly destitute of marble, frequently adorn their mansions, under the directions of French architects, with stairs and balustrades of Carrara marble, and that at Berlin, Vienna, and Munich a similar prodigality is not rarely to be met with. At this very day, the Sultan of Turkey and the Viceroy of Egypt transmit orders to the same quarries, for the decoration of palaces which they never inhabit—not jewel-worked specimens merely, but lofty pillars and balustrades for spacious galleries. It is not, indeed, every ruler who goes to the excess of the First Napoleon, and insists upon the employment of this material, rapidly dwindling as it is, in the building of a barrack; short of this, however, the principle of the waste going forward is very much the same. The ancients decreed, at one time, when their art-genius was at the highest, that neither Carrara nor Pentelicus should be quarried, except by the architects of temples; but now the market is for all the world. The Italian Government, it is true, did once hint at a protectorate over these treasures; but nothing more has been heard of the measure. Meanwhile, the Italians profess to be alarmed lest America should compel them to work out their incomparable quarries.

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THE PRESIDENT'S ADDRESS AT THE INSTITUTE OF BRITISH ARCHITECTS.

MR. WHICHCORD'S inaugural address at the Institute last Monday, reported in another page, if it did not appeal to the sympathies of the art-architect, was, at least practical, and embraced a large number of subjects. Mr. Whichcord touched on the architectural embellishment of London, contrasting the apathy of English speculators with the wonderful metamorphosis that has been effected in Paris and other cities of France since her misfortunes; he descanted on the relation of the Board of Works to the Institute and the profession, and advocated the advantage of co-operation; he dwelt on the questions of quantities, restoration, the necessity of keeping abreast in scientific and practical matters, and finally hinted the advantage that would be derived from a closer relationship between the Institute and our colonies, and the various professional societies in the United Kingdom. These questions are not new: they are taken up again and again by successive presidents, and every succeeding occupant of the chair profits by the hints and suggestions of his predecessors, and so we have a right to expect that recent addresses shall at least be full and comprehensive. It may be asked with fairness, however, whether so comprehensive a programme is likely to produce such practical results as a more moderate one? If Mr. Whichcord can carry out a fraction of the reforms he has suggested in his paper, he will not have occupied the position of President in vain. If he even emulates in some respects the late President, Mr. Charles Barry, he will deserve well, for it must be confessed that the Institute has, during the last year or two, been at least endeavouring to recover its lost position among the profession and the public at large. We think one or two of the heads of the President's address especially commend themselves to the Council's attention: one is the benefit that would be derived from a better understanding with so important a body as the Metropolitan Board of Works, which has powers of increasing consequence to the profession. At present architects will acknowledge, although there be a statutory connection between them in the election of district surveyors, that their counsel and recommendations in relation to public improvements fare badly, and that the Metropolitan Board and Council of the Institute are irreconcilable factors in premoting the architectural embellishment of the metropolis. Every one will endorse the opinion also, that on no account should members of the Institute be permitted to engage in certain business negotiations; as, for instance, in the purchasing of land offered for sale by the Board. As regards the Institute acting as an arbiter on matters of taste, as, for example, in deciding upon the elevations of large and important structures, it is clearly a duty within their proper functions, though even in this case there is danger of falling into a narrow groove, and restricting the freedom of architectural taste; and we should, therefore, take every care to select competent committees composed of members holding different views. The President did not touch upon this part of the relation subsisting between the Board and the Institute. The restrictions as regards foundations, rights of light, and other legislative regulations are points of considerable importance to the architect; but it is only by a joint co-operation that any desirable measure of reform in these directions can be looked for. We quite agree, by the way, with the suggestion that if ground-rents of sites like Northumberland-avenue were put at a lower scale, investment would be sought after with more zeal, and architectural improvement would follow.

One other point which has been mooted before, and which the late President dwelt upon in his opening address, was also advovated with equal zeal by Mr. Whichcord: we allude to the desirability of the Institute becoming the acknowledged centre of all the provincial societies. The Institute, no doubt, would be infinitely the gainer by such an arrangement, but the question is whether the provincial societies, on their part, will think such a change necessary to improve their position. The London society has, of course, everything to gain by becoming the centre of professional control, while the local bodies derive their position and life-blood, so to speak, from their local independence and government. For many reasons we should be glad to see a fusion; it would assist in the establishment of uniform practices among architects; the vexed questions of quantity-taking and competitions might be speedily settled; uniformity in measuring and other principles of professional practice would be secured upon some equitable understanding; and the concurrent action of the profession throughout the provinces would be desirable in cases affecting the legal responsibilities of architects; on the other hand, while union would be strength, there would still remain a large body of outsiders who would become more estranged than they are now from what they would regard as a kind of official coercion and interference, and we are almost afraid the spirit of energy and independence which so characterises some of the provincial associations would be broken so soon as local enterprise and action gave place to centralising influence. These are certainly two aspects in which we must view the proposal. If the societies in the provinces can acquiesce in the proposal that they should delegate members for the purpose of discussing the subject of a closer union, something might be done; but negotiations have hitherto failed to bring about a definite scheme. The appointment of local honorary secretaries was another proposition of the President as a step towards affiliation; but till the Institute and the local societies can fairly meet upon some common ground and agree to a general code of by-laws, in which the charter of the Institute shall not be contravened, little progress towards the affiliation of provincial societies can be expected. The remarks made as to by-law 14 relating to the proposal to make candidates for membership pass a test of examination, deserve also to be read by the younger members of the profession with some attention. Mr. Whichcord showed that the Institute of Accountants, the Institute of Actuaries, the Dentists, besides members of the learned professions, have now means for testing their candidates, or are introducing Bills into Parliament to enable them to enforce some kind of examination. We have always maintained the value of such an examination. Of course the one great difficulty that has been made a reason for opposing such a scheme is that no board of examiners can test the artistic powers of a candidate, and that no examination can bestow upon the candidate the taste necessary for good design; but this argument does not weigh against the undoubted advantage of every architect being skilled in materials and construction, and in the rudiments of general knowledge, while of course he should be a proficient in geometrical and freehand drawing, the elements of which might easily be acquired.

We much regret the spirit of flunkeyism which still prevails in Conduit-street. The form of investiture undergone by the President at the hands of the late President on taking his chair, is something like a burlesque of that submitted to by each yearly aldermanic tenant of the Mansion House. It is no matter for surprise that the ludicrous aspect of what Mr. Whichcord apologetically, but aptly, introduced as a "dramatic incident" provoked among many of the members and visitors an outburst of laughter which politeness could not entirely stifle. The ceremony certainly betokened a pitiable pomposity, and the servile terms in which the late President proposed that three Royal princes should be invited, for the purpose of conferring on them the title of Honorary Fellows, savoured strongly of sycophancy.

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THE WINTER EXHIBITION OF THE SOCIETY OF BRITISH ARTISTS.

FOR variety of subjects and for the study of the manner of some of our leading modern painters, the exhibitions of the Society of British Artists have always maintained prominence. The Winter Exhibition just opened in Suffolk-street, Pall Mall East, is full of choice works in landscape, imaginative, homely, historical, and *genre* subjects. Mr. Seymour Lucas, who generally paints with energy and spirit, has a clever piece entitled "On the Track" which the visitor cannot fail to notice as he enters. The old pursuivant, led by bloodhounds, looks as if he were close on the scent; the road and the hedge are quietly introduced, throwing out the figures, which are painted with animation. There is a thrilling sentiment conveyed in Mr. Thomas Hill's, "What Is Now, and What Hath Been" (5), though the subject is a modest one. Down an old worn and dilapidated stone stair a girl in black is descending, with a tread of caution and wonderment, expressive of the emotion that is awakened within her. Mr. A. Pollentine's "St. Mark's Place, Venice" (16), is poor and slurred in drawing; the detail of the sculptured ornament to the porches is indicated in a very rough and careless manner, all the more to be regretted as the artist has displayed a feeling for breadth of light and shade and colour. Mr. Holyoake, in 23, exhibits one of his broad and suggestively-painted pictures. It is a lowly lover, a young shepherd, casting furtive glances, or reflecting pensively on his fate—we can hardly say which—while his admired one turns her face back to give him a look as she passes with her "paternal." But the figures are rather crudely painted, the grass meadow alone arresting our attention for the dexterous effect obtained by very simple manipulation of colour. H. Corrodi's "Gate of Nicosia, Cyprus," is a sunny piece; a group of market-people are shown entering the town, and the execution is careful, and colouring transparent with tints of orange glazed. The "Fête Champêtre" (27), by A. J. Woolmer, is a dreamy picture, reminding us of some of Turner's earlier works; it is certainly poor in drawing; the figures under the cedars are crude, and too large; but Mr. Woolmer's style, sometimes grand, is essentially very suggestive here of the sensational in effect, and too "stagey" to be called truthful. The same painter's "Path of Danger" (44) is painted in a similar spirit, sparkling with iridescent tints and poetical in sentiment; but we have no work from this artist's pencil equal to his "Haunts of the Sea-Nymphs," or his "Primeval Forest," of last year. "Gold Fish" (34) is rich in tone, but the arm of the girl is out of drawing. Mr. R. L. Gordon contributes a pretty face, of delicate features, in a black velvet bonnet. The contrast of the fair hair and the black material and muff has produced a pleasing picture. Another pleasing face — this time a dark beauty — is given us in C. W. Pittard's "Sennora," thoroughly Spanish in cast and expression. The visitor will find some bold painting in "Roses," by J. H. S. Mann; and careful handling in "Dreaming" (77), by H. T. Schäfer, though a trifle sensuous in feeling. A vigorous bit is E. Ellis's "The Conway Walls"; the "Painter's Little Model," by J. Archer, R.S.A., is not the most pleasing of types; the unnatural flush in the white cheeks is expressive rather of sickliness than health. "Ebb Tide, Coast of Cumberland," by H. Moore, is a bright pearly picture of coast scenery, in which white and blue are the only colours; the effect obtained is luminous and transparent, if we cannot call it legitimate painting. Mr. J. Hayllar sends a very truthful study in "An Old Sandpit" (89), and Fred Hines (93) a conscientious rendering of scenery in "A Hampshire Lane." No. 92, "The Fairest of Maids in the Brownest of Studies," does not tell its tale very expressively. The maiden leaning in a pensive mood against the stile, and the background, a sunny field, are both certainly fair; but the brownest of studies is not so apparent, though the closed book held in one hand may suggest the idea. The girl certainly looks listless. Mr. J. Macbeth's very bold canvas, "Mountain and Glen," gives evidence of vigorous conception; but the grandeur of the piece is destroyed by the figure of a woman carrying large bundles of cloths, and the winding pathway with ruts full of water, is stiffly drawn. In this room we also note "Over the River," by B. G. Head, though we do not see where the reflection of light in the pink parasol comes from. "Begone Dull Care!" by D. Pasmore; and the "Politicians," by J. M. Burfield, are not without humour, though somewhat hard in colouring. In the large gallery several excellent pictures are to be seen. We especially note No. 121, "King Alfred is Godfather to King Guthorm the Dane," by Andrew B. Donaldson. This painting portrays the presenting of Guthorm for baptism. The incident is suggested by a passage in Dr. Pauli's "Life of King Alfred the Great." Mr. Donaldson has certainly displayed skill in the composition of his historic theme, and though the kneeling figures of Guthorm and his disciples to the left are chargeable with stiffness in drawing, the accessories exhibit study and care. The font is perhaps of too florid a Romanesque type for the time, to be correct; on the whole, however, the subject is handled with becoming dignity, and the painting, if, perhaps, a trifle crude and conventional, is distinguished for the quality of moderation in the range of colour and *chiaro-scuro*. A very truthful picture is by J. Gow (127), "The Young Poet, Robert Bloomfield, Reading to the Shoemakers." The colouring is harmonious, and there is a soft delicate handling in the lights and shadows; but these technical qualities are equalled by the composition itself: the grouping of the shoemakers, and their expression of surprise at the intelligent young reader at the window, are rendered with a refinement and pathos that appeal to the mind. Miss Mary L. Gow's "Reverie" (134) is also charming for its Japanesque accessories. A striking picture, ambitious in size and colour, is Mr. Bromley's "George Heriot's Interview with Nigel in the Tower" (147). The key of colour chosen is not quite in keeping with the historical subject, and the drawing of the hands of attendant is faulty; altogether we are rather disappointed with the work, in spite of some merits of composition. "A Mother's Care" (156), by Jno. R. Reid, is a clever work; we must note, too, a clever study in Mr. Godfrey Hindley's "Begone Dull Care" (159), in which the harmony is as conspicuous as the excellent drawing of furniture. The chair, with its straight-framed back and red cushions, the cabinet and tapestried background, and the costume are all correct in detail. All Mr. Burr's works are clever as truthful delineations. We may here notice his amusing picture, entitled, "Incorrigible" (162), which for humour and technical qualities of painting is almost perfect. The young urchin in front of the master's desk, with dunce's cap on his head, showing his apple, looks as happily unconcerned as the countenance of the old schoolmaster looks exasperated and harassed. Striking at a distance, though wanting in breadth of foliage is (No. 181) "Gloomy Winter's now Awa'," by Walter D. Batley. As a contrast to this, we note No. 191, "On the Edge of the Common," by Benjamin D. Sigmund, far too minute and leafy in the foliage, though clever as a production of the school of Holman Hunt. There is a want of repose in "Many Happy Returns of the Day," by A. Ludovici, junr., though it is a pleasing cabinet picture. No. 202, by D. Pasmore, is rich in colour; and No. 203 is equally worthy of passing attention. Vigorous and muscular in touch is No. 212, "And it was Windy Weather," by E. Ellis; certainly the trees express the fury of Boreas. There is a great want of breadth in the colouring of 216, "Quite in Confidence," by H. G. Glindoni; the two engaged in conversation are dressed in the costume of Louis XV., but the figures lack ease, and the details are tawdry. A very exquisite little cabinet hung too low is 230, "Interior near Fontainebleau," by Beatrice Meyer. The chimney-piece, carved in an early Renaissance style, the bas-relief panel of Madonna over, and the sitting figures, are delicately and skilfully painted. At the corner of the room a large picture, by Clint Miles (233), "Victoria Tower and Westminster Abbey," from Lambeth, strikes the attention. The artist has chosen the view of the three towers as seen from the river on the west side; the setting sun and the murky evening sky are truthfully painted, but the palace is wrapped in shade and mist, and the detail is invisible. Another very striking canvas is No. 246, "A Weedy Corner." Mr. Theodore Hines is always a fertile master in rural subjects, and here he has depicted, with graphic power and conscientious detail, a mass of flowering weeds and grass, and has produced a really pleasing picture out of a very modest subject. Mr. John Burr is equally successful in his two spirited and clever studies of London-street life. "The Flower-Girl" (247), with her unkempt hair and dirty-looking, pallor-stricken face, selling flowers, is wonderfully true to life; while "A Watercress Boy" (282) is quite as faithful a transcript of the East-end street-arab. "On the Nidd at Knaresboro'" is softly painted. A great deal of delicacy and refinement is evinced in G. F. Cook's "Waifs from the Sea of Time," a pleasing study from still life, in which some primitive pottery and a bas-relief make up the subject. Mr. W. H. Bartlett's "Labour of Love" (268), and especially Mr. Jno. White's picture illustrating—

> "When sheep are in fold and cattle in shed,"

(No. 271). are well worth notice. Mr. White's painting possesses good qualities, and the handling is thoroughly masterly. We must also notice in passing Mr. Baker's, "Wellburn Hall," Yorkshire, "Matchmaking," by H. Helmick (281); "Touching Him Up," by Hamlet Bannerman, clever in the accessories; No. 284, "A Sussex Common," by J. Peel; "Good-bye, Sweetheart," by L. C. Henley, and "Listless" (290); "Waiting for the Tide," by P. Macnab; Mr. Meyer's view "On the Coast of Brittany" (291) is a finely-painted piece of coast-scenery; the red rocks in the foreground and the surf and green sea make up a powerful contrast of colour. Mr. Barrable, in No. 297, has a fine study of a young lady attired in a peacock-green dress reading letter; the expression is touching, and the rich background enhances the effect. There is a broad play of light and shade and an agreeable balance of colour. We cannot pass by also a large architectural picture (299), "The Bride's Door, St. Sebald, Nuremberg," by Wyke Bayliss. This artist is always truthful in his drawing of subjects of this kind, and in the present instance he has given us a charming piece of Late Pointed; the traceried windows and the pierced tracery to drop-arch of doorway are skilfully drawn, and the stone walling is dexterously manipulated. The varied tints of the stones are carefully rendered, and their granular texture produced by the "scumbling" or glazing over. A few other pictures of merit we can only glance at Mr. C. Cattermole's "The Ford" (306); "A Brook in New Forest," by T. F. Goodall (310); "A Maiden's Secret," by W. D. Sadler; "The Old Oaks," by A. de Biseau; and Mr. Schäfer's, "Old Age," are all interesting. In the third room we can only stop to admire Mr. F. Hine's "Birches" (329), a transparent and natural rendering; Mr. Yeend King's "A Safe Confidant" (349); John Burr's "After the Dance" (357); Mr. Henley's "Off Guard" (375); Carle Bauerle's "Spring" (467); J. H. Caffieri's "Burnham Beeches," 439. "Ducal Palace, Venice" (339), has not improved in Mr. Henry's hands—the work is too coarse in detail; "Compliments" (361) is very stiffly painted, and A. M. Rossi's "News from Abroad," a group of young ladies in evening dress, is sadly spoilt by the carpet-pattern being so particularised, and the over-bright flowers in conservatory. A few meritorious pictures are to be seen in the fourth room. "La Danseuse," a girl, pretty and fair, dressed in a transparent robe of black net or tulle, through which her figure is seen, is painted with taste and feeling. A. Ludovici's "Waiting for a Partner," is well-conceived and spirited; the "Winter Garden" (478), by James Macbeth, is sadly out of scale in the little girl, which is disproportionately small, and the treatment too naturalesque. No. 488, by W. H. Bartlett, is painfully stiff. A clever harmony of green drapery and pottery is No. 500, "Still Life," by Harriette Edith Grace; Mr. Hine's "View at Newnham, Isle of Wight" (503), is thick in execution; a clever expressive face is "Old Amato" (506), by Sydney Paget. "Study of Flowers" (517) is a luxuriant group, by Marguerite Ludovici, and No. 531, "At Dover," is a masterly sketch by Vincent P. Yglesias. Exquisitely tender and soft in expression is the face in No. 339, "The Letter." We may mention in passing also Nos. 516, 557, 579, and 603.

The water-colours look feeble after the powerful display of oil-pictures. We must, however, award praise to the works of a few artists whose names are now pretty well known. For instance, A. Ludovici, who contributes several oil paintings, wins a mention for a clever study of a lady dressed in light blue waiting for her carriage (616), that shows this artist's forte is not exclusively confined to one branch of the art. "Wells

Cathedral, from Bishop's Palace" (624), is one of Mr. R. Phené Spiers's clever and transparent sketches. We have on previous occasions drawn attention to the very effective quality of this artist's work, due largely to the fact that Mr. Spiers expresses his detail in colour rather than in line, and does not resort to the tricky means of effect used by some. The same gentleman's "Farm Buildings" (751) is a pretty sketch of a wooden barn, executed in the same manner. We must also notice No. 627, "A Street in Clovelly, N. Devon," by J. F. Anderson, a pleasing bit of colour. Mr. David Law sends a masterly sketch of "Cookham Church," in his best style (633), rather massive in handling. "Ewhurst Common" (649) is exceedingly clever and conscientious, and the aërial effect of valley well depicted. "On Whitby Scar" is a bold piece of coast, by P. Toft. Mr. T. F. Wainewright contributes some softly-coloured pastoral sketches: we note 670, 718. Architectural subjects are few: we draw attention to Mr. G. R. Clarke's "Porte de Bruxelles, Ghent" (656); Miss L. Fennell's "Bolton Abbey" (674), a view across the choir, with some careful Norman detail; Mr. T. C. Dibden's "Beauvais," a picturesque bit showing the noble apse and cathedral drawn with much feeling and colour; No. 714; No. 755, "Tomb in the Old Church, Cheyne Walk, Chelsea," by W. E. Brown, and two fine interiors by Wyke Bayliss (Nos. 760 and 765). Mr. Bayliss is as facile with his brush in water-colour as he is in oil. "The Choir of St. Salvador, Bruges," is an elaborate subject; but the artist has done justice to the fine Renaissance screen; the detail is carefully drawn and the colouring bold and effective. The other drawing, "Interior of Notre Dame, Chalons," is rather spotty, and not so decided in detail, Mr. A. Herman Haig sends a skilful sketch taken from the cloisters of St. Antonio, Padua (764). The arcade and the brick campaniles are drawn with much spirit and decision. Nos. 714, 772, 777, 783, 791, 799, 829, 841, 842, 843, 863, are all worth notice. We must single out especially Mr. Thomas Pyne's fresh-looking sketches of "Arundel Castle" and "Sussex Meadows," both sketchy and spirited in execution; and Mr. Ross's "Village Library" (791), a clever and solidly-painted piece with a touch of quiet humour in it.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE opening meeting of the Institute session was held on Monday evening in the renovated room, the President, Mr. John Whichcord, F.S.A., in the chair. The President distributed certificates of proficiency in the voluntary architectural examinations to Bruce Capel (who was also awarded the Ashpitel Prize), Hugh Jacques, and Mr. Lachlan, and a reward of merit in the preliminary examination to Walter Scott. The Secretary read a letter from Mr. T. H. Wyatt, as president of the Architects' Benevolent Society, who announced that the offer made by Mr. Geo. Godwin, in May last, of £100 towards £1,500 required to raise the funded property of the Society to £5,000, had resulted in a net sum, after deducting £5 10s. for expenses, in an addition of over £1,608 to the fund, and in procuring 15 new subscribers. Thanks were expressed to Mr. Florence, then president of the Architectural Association, for the assistance rendered through his appeal to the Association, who had evidenced their sympathy and co-operation by subscribing £120. Of the £1,600, £700 was subscribed by members of the Institute. A ballot then took place, under the new rules, in the library, Messrs. Wyatt Papworth and E. R. Robson acting as scrutineers, when Messrs. A. Kershaw, A. Bovill, M. Ellis, and W. Stokes were elected associates, out of five candidates balloted for.

ROYAL ASSOCIATES.

Mr. Chas. Barry, ex-President, said he wished to read some correspondence which had already given much satisfaction to the Council. After the annual dinner, at which the Prince of Wales was their guest, he waited upon the Prince to present him, at his request, with a report of the proceedings, and his Royal Highness expressed his satisfaction with the proceedings. It had occurred to the speaker that it might not be improper to request the Prince's Royal brothers to become in some way connected with the Institute. He accordingly wrote to Mr. Knollys whether such a suggestion would be agreeable to the Prince, and he replied that H.R.H. quite approved of the proposed invitation. He accordingly wrote to Mr. W. J. Colville, secretary to the Duke of Edinburgh, requesting to be allowed to nominate H.R.H. as an honorary fellow, explaining the aims and objects of the Institute, and that no one having any connection with trade or manufacture was eligible for membership; to this a reply was received, that it would give the Duke of Edinburgh much pleasure if Mr. Barry would do him the honour of nominating him. In response to a similar letter addressed to the secretary to the Duke of Connaught, that gentleman, Colonel Howard Elphinstone, said the Duke would have pleasure in having his name proposed, and R. K. Collins, Esq., replied that H.R.H. Prince Leopold would accept, with pleasure, the courteous offer. He, therefore, had to formally give notice that he should propose that their Royal Highnesses be elected, as he was sure they would be, with acclamation, at their next meeting. He ventured to think that this auspicious event would be of some lasting benefit to the Institute, and that their Royal Highnesses would feel satisfaction in assisting to promote the study of civil and ecclesiastical architecture; he was sure that they would be received with warm feelings by the members, and that their Royal Highnesses would sympathise with a sense of that high tone and probity towards their clients which had so long distinguished them.

PRESENTATION OF GOLD BADGE.

The President remarked that Mr. Barry had been most fortunate in inducing such a trio of illustrious personages to join the Institute; and now, he added, they had a somewhat dramatic ceremony to perform. They were aware that Professor Donaldson had presented a very handsome badge of office, to be worn by the successive presidents of the Institute. In the unfortunate absence of Professor Donaldson (a letter from whom had been read, explaining that he could not attend as he was suffering from bronchitis, and expressing hearty and cordial sympathy with the members), he had to request his immediate predecessor, Mr. Barry, to perform the duties of investment. Mr. Barry mentioned that Professor Donaldson had written to him explaining that he had intended to bequeath funds for the purchase of such a badge, but he had felt the kind expressions towards him as "the father of the profession" made by the Prince of Wales at their dinner, and thought he could not do better than present the badge in commemoration of the dinner. The badge, which was attached to a massive gold chain, would be a lasting memorial of their friend, and it would be a sad day when his venerable presence would be missed from amongst them and his familiar voice heard no more. Amidst applause, not unmingled with laughter, Mr. Barry proceeded to invest the President, who at some length expressed the pleasure with which the members received the decoration, and proposed a formal vote of thanks to the donor, a motion which was heartily adopted.

ST. MARK'S, VENICE.

The Secretary reported that he had had an interview with General Menabrea, the Italian Ambassador, on the question of the proposed restoration of St. Mark's, Venice. General Menabrea stated that the basilica was in actual danger of undermining, and that an endeavour was being made to preserve it. The Ambassador reminded him that not only was Venice built on the sea, but it was a floating city. He had since written him the following letter:—"Londres, le 29 Novembre, 1879. Monsieur,—Je viens vous prier d'être mon interprète auprès de M. le Président du Royal Institute of British Architects en le remerciant de la gracieuse invitation à la séance de l'Institute qui aura lieu Lundi prochain à 8 heures du soir. Moi, je regrette de ne pouvoir y assister, car je dois intervenir le même soir et presqu'à la même heure à une réunion de la Royal Society. Du reste, comme dans votre séance il s'agirait de discuter les réparations de la Basilique de St. Marc à Venise, ma présence, ou celle d'un membre quelconque de l'Ambassade, serait tout-a-fait superflue—même inopportune après les informations à ce sujet qui ont été publiées dans le *Times* du 27 et du 28 courant. On pourra, d'après elles, se convaincre que—avant qu'aucune agitation se soit manifestée en Angleterre au sujet de cette question artistique et archéologique—le Gouvernement Italien s'était sérieusement preoccupé de St. Marc, et avait pris des mesures énergiques pour préserver de la ruine, dont il était menacé, cette unique monument, et pour mettre à l'abris des profanations les merveilles artistiques qu'il renferme. Votre société peut donc être rassurée—car l'Italie, qui a été le berceau des arts en Europe, en à conservé, le sentiment et les traditions; elle ne laisse à aucun autre le soin d'être plus jaloux qu'elle de la conservation des richesses artistiques dont son sol est couvert et dont elle est justement glorieuse. Veuillez, Monsieur, agréer l'assurance des sentiments de considération trésdistinguée de votre tout dévoué serviteur. Menabrea, Ambassadeur d'Italie. À Mr. William H. White, Secrétaire du Royal Institute of British Architects."

The President then delivered his

OPENING ADDRESS.

Turning back to past records, he saw it was just twenty years since Earl de Grey, his noble predecessor, delivered his inaugural address in the new rooms, at 9, Conduit-street. The Earl had been then president for twenty-four years, during which period the number of professional members had increased from 13 to 293. The speaker was glad to welcome the members within the same walls but in rooms which, he trusted, would be considered an improvement upon the old, and to note that the number of Fellows and Associates was now 681. It was his painful duty to record the decease since they last met of a very old member, Mr. W. Southcotte Inman; and amongst other deceased members three names more prominent than the rest, and familiar to the professional ear, claimed from him more than a passing word. The death of Joseph Louis Duc, at Paris; of Eugène Emmanuel Viollet-le-Duc, at Lausanne; and of Edward Blore, in London, were events of more than general interest. They were episodes in architectural history. The enthusiasm, learning, and ability which comparatively young men have witnessed in what is now called the Gothic Revival were not due to any sudden inspiration, nor were they rapid in their growth. The seed was sown towards the close of the last century; the pen preceded the pencil in successful attempts to interest the public with mediæval legend and antiquarian research. Edward Blore, who has just died at the age of eighty, was perhaps the last of that generation of workers who fifty and more years ago were familiarising the nation with stories and sketches of the many native buildings, more or less decaying, scattered over this island,—ancestral works which then were neither appreciated nor understood. To him, a contemporary and fellow-worker with Pugin, might be partly attributed the change that had occurred, in this particular, among the majority of Englishmen. Sir Walter Scott, to whom a recent period of revival was more indebted than perhaps it was willing to own, might be called the patron of Edward Blore, whose earliest work of practical architecture was the front of Abbotsford House, over which, however, Sir Walter had probably no small influence and control. Blore, who was intrusted with the repair of several English and Scotch cathedrals, was ultimately appointed architect to King William IV., and afterwards to Her Majesty the Queen, having been employed both at Windsor Castle and Buckingham Palace. He also erected some well-known and important residences in different parts of the country; his drawings and etchings were extremely valuable, the books he illustrated numerous. The pre-eminence of Viollet-le-Duc over all other exponents of the artistic theories and precedents he illustrated must indisputably be acknowledged. Both in diagram and description he was unsurpassed. More, he used his natural power of logical deduction to explain methods of construction, or give a reason for forms of design, with strength and ability such as none of his predecessors had exhibited. All the illustrations to his numerous publications were made by himself, generally drawn and shaded on the wood by his own hand; and when it was remembered how comprehensive and elaborate were the illustrations to the sixteen volumes comprising his two great dictionaries, it was difficult to withhold astonishment or limit admiration. He began to sketch his native buildings early, and he had completed a large number of such drawings before the introduction of photography unhappily diminished the ardour of draughtsmen travelling in pursuit of practical example and archæological parallel. He extended the theory of those "true principles" of architecture which Pugin had earlier made the basis of a creed; and was equally happy with pencil and pen in the delineation of Grecian and Roman remains. Nor in his devotion to a particular current of architectural idea was he oblivious of the source whence the stream flowed. To some of his colleagues whose practice lay in the adaptation of a mode of construction older than the thirteenth century he paid a just meed of admiration. The works of Neo-Greek design, conducted by M. Duc at the Palais de Justice, in Paris, were often alluded to with delight by M. Viollet-le-Duc, while the former never hesitated to admit the value to a classical architect of M. Viollet-le-Duc's mediæval researches. Both had received the Royal Gold Medal, and the visit paid to them, in 1876, by M. Duc was still fresh in his hearers' memories. At that time M. Duc had been thirty-six years architect to the Palais de Justice. The work had year by year progressed; as each new portion reached completion an old building was pulled down. Before his death he conversed in turn with the heads of the various trades employed in the buildings, and left definite instructions with each. During thirty-nine years almost everything—to a wooden bench or an iron bar—had been designed under his direction or with his own hand. In giving up his charge he must have felt the satisfaction with which the knowledge of duty done and hard work accomplished was happily accompanied. Passing on to compare the municipal improvements effected in London and Paris, the President said that it would be rash to suggest and futile to hope that this enormous metropolis, entangled with every sort of legalised complication both of land and house, would ever present to living men anything like the metamorphosis that had been lately witnessed by less than a generations of Parisians. It was said that French improvements had not paid; but did those in this metropolis "pay"? It was a long time since designs for new buildings in Northumberland-avenue had been submitted to the Council of the Institute. The Metropolitan Board of Works had attributed the delay in letting this land to the general depression in business, and to the expensive character of the buildings required to be erected. But when it was remembered that in Northumberland-avenue the foundations to the new buildings must be unusually expensive, and that the restrictions as regards dominant rights of light encouraged by the present mischievous state of the law were numerous, it might have proved true economy to have put the ground-rents at a scale that would have attracted immediate investors. He regretted also that many undoubted improvements, should have been executed by the board without adequate regard to the architectural embellishment of the metropolis. The responsibilities, duties, and powers of the Metropolitan Board of Works were enormous, and were annually increasing. It was not only important that the organisation for devising and deciding the details of street improvements should be the best of the kind available, but it was also important that the machinery employed for purchasing, letting, and selling the common property of the metropolitan ratepayers should be well put together. Now, both individually and collectively, architects were in constant communication with the Metropolitan Board. The Institute, as a corporate body, not only wished well to the board, but would do whatever might lie in its power to aid in the discharge of its manifold functions. Architects might be elected members of that board, just as barristers, solicitors, and doctors might be so elected. It would be ridiculous to say that professional men should not sit at that board because they might have had a pecuniary interest in some of its public business transactions. But he should run no risk of censure when he said that a fellow or an associate of the Institute, if he were elected a member of the Metropolitan Board of Works, ought not from that moment to have any professional connection whatever with the purchase of land offered for sale or lease by the board; nor should he be professionally engaged in the superintendence of buildings to be erected upon land which was the property of ratepayers, whose agent and representative he was. The subject of "Illicit Commissions" had again been brought before the public, and a temperate letter to the *Times* from Sir Edmund Beckett, one of their Honorary Associates, recently afforded an admirable comment upon the present phase of the difficulty. Their course, as a corporate body, was clear; the declarations taken by their members were framed many years before it was discovered in the newspapers that a great deal of unrecognised dishonesty existed in almost every rank of the community. But time had brought its softening influence to bear upon their well-intentioned maligners; they had felt the impropriety of making against the whole profession a charge which could not be made with impunity against individuals. Two years ago the Council, in their report, which was adopted by the Institute, declared themselves ready to co-operate with the legislature, in order to prevent and exterminate what in an architect, who was the fiduciary agent of his employer, was neither more nor less than fraud. There was, however, one detail of architectural practice—often forced upon professional men who happened to be situated at a distance from the large provincial capitals—which offered to the outsider an easy handle of criticism. It lay in the mode of payment adopted for bills of quantities. In London and the chief cities these bills were prepared by specialists; and there was no absolute necessity for an architect to prepare bills of quantities for his own works. As a rule, he did not take out the quantities, nor did he derive any pecuniary benefit from them; but when he did, the declaration taken by both fellows and associates was sufficiently precise. The words in the case of a fellow were:—"I will not take out quantities except for works to be executed under my own superintendence, and then only with the concurrence of my client: such quantities being paid for by him"; and in the case of an Associate:—"I will not take out the quantities for works to be executed under my own superintendence except with the concurrence of my client, and unless the said quantities are paid for by him." In making these quotations his object was to inform outsiders of the obligations accepted by every professional member, rather than to remind the members themselves of the discipline to which they all voluntarily submitted. Referring to the recent alterations, the President mentioned that Mr. Phipps had prepared several designs which were necessarily set aside, and he was therefore good enough to accept the usual professional honorarium, and the Council took upon themselves collectively the task of advising some comparatively small alterations and renovation of the rooms. They ultimately appointed a committee of four of their number to carry out the approved plans. One of the members of this building committee was Mr. Macvicar Anderson, who foreseeing the possible embarrassment of four architects engaged in the joint superintendence of building works, chivalrously consented to take charge of the matter, at the same time declining to accept any pecuniary compensation. The reasonable conservation of ancient and mediæval monuments was a question too important to be ignored by architects or omitted in a presidential address. That news of a reported restoration of the west front of St. Mark's Church at Venice should be received in this country with some dismay was natural and explicable. Nor had Englishmen any right to expect foreign nations to take a similar interest in the old churches and cathedrals of these islands. Even presuming it possible now to destroy or mutilate a mediæval building in Great Britain or Ireland, the misfortune would not be felt by the Italians, because similar works of the same character abounded throughout Western Europe; America might justly complain, Italy never. But there was only one Venice, and the history of our modern world began with Rome. Hence the anxiety of Englishmen for the original works of Italian masters; hence their excuse for a protest which under other circumstances would have been impertinent. Indeed, thinking men in this country were beginning to appreciate the real meaning of what after all was a comparative novelty both in practice and phrase. In past times no people ever "restored" as the word was understood at present; neither the Latin nor the Norman-French contained any word equivalent to the modern term of restoration. The classical and mediæval architects pulled down, altered, added, or rebuilt, as necessity dictated or authority required, and to this fact was largely due the multitudinous variety of architectural precedents. The substantial records of every known nation showed architecture to have been, though artistically conservative, a progressive science. To attempt to maintain that every useful building was to be left untouched if only it were old, and that every useless obstruction was to remain an obstruction if only it be beautiful, was a paradox opposed to the very principles upon which our forefathers constructed the self-same buildings that now delighted the many and rendered a few enthusiastic people almost inconsistent. The architect was both an engineer and an archæologist. He must, as a rule, when arrived at the three cross-roads of the proverb, take the middle one; he was neither free to follow the engineer alone, nor the archæologist alone. He would not, like the engineer, be "the first by whom the new is tried;" he must not, like the archæologist, be "the last to lay the old aside." It was, he thought, most desirable that the character of the papers read at the Institute, and that of the discussions which follow them, should be worthy of the subjects examined—useful contributions to the half-art half-science that the members practised and upheld. There was no lack of literary work offered or suggested to the council; their want lay in the difficulty of obtaining practical expositions of current subjects connected with architecture. It was of little use or interest for members to be argued into a belief that one style was better than another, or even that one phase of æsthetic design was more delicate than others. A see-saw of rhetoric existed to prove the futility of such discussion. Papers upon practical subjects—on the best system of combining materials in different situations, on the best results obtained from experience of iron and concrete or of building houses that well resist fire, on modes of construction adopted in other countries, on the application of steel, of terracotta, of plasters and cements to modern habitations—were likely to be far more welcome to the majority of members within their own circle, and far more useful to everybody outside it, than the most learned dissertation upon the mutability of fashion, or the wittiest homily on the perversion of taste. The "Dictionary of Architecture" was now on the high road to completion; the letter O was published, and the letter P greatly advanced. With the Proceedings, it had been determined for the future to issue notices and communications made by the Architects' Benevolent Society to its subscribers and donors, and their secretary, Mr. White, had undertaken to act as hon. secretary of that society, so that henceforward the business of the charity would be conducted in the office of the Institute. Now that the room in which they were would be devoted during the day to purposes of reading and writing, the council-room would be the proper place in which the active members of the Benevolent Society could meet—it being a rule that nothing should interfere, even for an hour, to diminish the value and usefulness of our library as a centre of reference and research. Only a few standard works of reference were now required to place the library among the best of its class, but he appealed for the contribution also of smaller and ephemeral publications and pamphlets to it. In future the meeting-room would be a general reading-room; some of the benches would be stored away and the rest so arranged as to leave the centre of the room free for readers. The advantage of possessing every day in the session accommodation for members who might wish to meet, or read or write, could not be disputed, and he trusted that some of the non-metropolitan members would take an early opportunity of proving the utility of a central place of meeting, and the metropolitan members might soon have opportunities of conversing, here, with colleagues from different parts of the country, on the practicability of measures long in contemplation, and now under discussion by the Council; he alluded to the relation of the provincial and colonial societies of the profession to this Institute. Something had already been done towards eliciting the views of the different Architectural Societies in England and Scotland, but the results had not encouraged the Council to formulate a definite scheme by which a more intimate connection than at present existed might be maintained. He would suggest that each of the larger societies might be asked to delegate one of their number, and the smaller societies situated in neighbouring localities might appoint a representative of two or more societies, to discuss the possibility of closer union. They could revert to the old system and appoint in different provincial centres one of these fellows as a local honorary secretary or representative of the Institute. Indeed, they had already W. W. Wardell as their representative at Sydney, in Australia; while, at Melbourne, Mr. W. Lloyd Tayler would act in a similar capacity, though subordinate to Mr. Wardell, who for more than twenty years was head of the Public Works Department there. These gentlemen had accepted the appointments in view of the International Exhibitions at Sydney and Melbourne held this year and the next, but the fact might be regarded as the renewal of a system which should be widely extended. As a step towards the affiliation of local societies he suggested that the Glasgow Institute of Architects should consent, for the general good and as a wholesome example, to be known as the Glasgow section of the Royal Institute of British Architects. He could not believe that their colleagues of Glasgow would think such an alteration derogatory to their position, or that in making the suggestion other than the most friendly intentions towards them would be manifested. The necessity for union, however, would become apparent as the time approached for the execution of By-law 14, which, if it was to have any practical effect at all, would compel every candidate for membership to pass the test of an examination. The terms of that by-law, agreed to in 1877, were that "All gentlemen engaged in the study or practice of civil architecture, before presenting themselves for election as associates, shall, after May, 1882, be required to pass an examination before their election, according to a standard to be fixed from time to time by the Council." The subject was now under inquiry at the hands of a special committee, who would in due course present a report. Meanwhile, perhaps, he might refer to some of the difficulties which obstructed that path, and arguing from what had been successfully done by other professional societies in pursuit of the results to which they aspired, give a rough sketch of what was not altogether impracticable. Even if it were possible, it was not desirable to make our profession a close one. He thought every candidate for associateship should be required to obtain a certificate from examiners appointed by the Institute, or that he should hold some qualification from a University, from the Royal Academy, the Science and Art Schools, or from other educational bodies, which qualification should serve to modify the terms of his examination. That once established, it would be easy to regulate a transfer from the Class of Associates to that of Fellows. Whether such a certificate should be given to all those who before May, 1882, had been duly elected associates was a question for consideration. It would be idle to disregard the probability that, for the first few years of a régime by which the test of an examination was made a condition of membership, there would be a falling-off in the number of new associates, and anterior to the proposed compulsory examination in May, 1882, there would be, comparatively, a very large accession of associates. Then would come the expected diminution of income from subscriptions, and the question would arise—Were they prepared to face such an eventuality? He thought they were, personally. Some members, however, might think it now too late in the day to make examination a condition of membership; they were already too numerous. It would be impossible to force examination upon actual members; it would be unfair to compel candidates for admission to undergo a test that the majority of their colleagues had escaped. But did they know that the Dentists had lately faced this difficulty and overcome it? It appeared to him that the question which might divide the Institute was not whether there should or should not be introduced the test of compulsory examination; but rather, What should be the character of such compulsory examination? Ought it to test the general education of a candidate, or should it be strictly professional in its details? The real difficulty lay in deciding upon the artistic capacity of a candidate. An idea doubtless prevailed that no Board of Examiners could pronounce an opinion which should be conclusive on the artistic powers of a candidate, or, to put it still more unfavourably, on taste partly natural and partly acquired. He would not discuss whether taste was a divine gift, an hereditary acquisition, or merely the result of association and education. But he was prepared to maintain that both geometrical and free-hand drawing were essential requirements for an architect. He might not, in the full tide of business, have either the time or the inclination to make or finish drawings, but he should know how to do so, if only for the proper exercise of his judgment and the due instruction of his pupils and assistants. He was also prepared to maintain that an architect should be cognisant of the general principles of construction, and that it was possible to define what those principles were; and that he should be acquainted with the nature, qualities, and value of those building materials that were in constant use in the localities with which he was or had been familiar. Local examinations, under the control of the Council, aided by honorary representatives, would, in different parts of the country, obviate difficulties and moderate abuses sometimes produced by over-wrought centralisation. Even in India and Australia similar opportunities might be offered to candidates for membership of this Institute, and the very difficulties of compulsory examination might thus help to bind heterogeneous off-shoots from the parent stem in one solid and enduring corporation. With regard to another subject, he hoped London would soon have reason to thank Parliament for a recent Act which had amended a part of the Artisans' and Labourers' Dwellings Act, and removed the difficulty experienced by the Metropolitan Board of Works in carrying out the provisions of that Act. The original Act of 1875 compelled the promoters of an improvement scheme to provide for the accommodation on the same area of all those persons of the working class inhabiting that area and displaced by that improvement scheme. The amended Act provided that, where the confirming authority was satisfied that equally convenient accommodation for the working class displaced could be provided in the vicinity, and that the required accommodation had been or was about to be provided, an improvement scheme might be forthwith executed. The authorities could, under the amended Act, use land belonging to them for the purpose of providing accommodation for those of the working class displaced by a scheme of improvement, or they might purchase land elsewhere. The amended Act also contained provisions for assessing, in the case of future schemes, the compensation payable for premises within an unhealthy area. In conclusion, Mr. Whichcord said: I have but a few more words to say, and they relate to myself. I have to thank you, gentlemen, for having placed me in this chair—a position to the attainment of which nothing in my career has pointed or induced me to expect. But now that I am here, I desire to be proved worthy of being not only a leader but your leader. I cannot hope to preside over a Session as brilliant as that you have just enjoyed under the auspices of my immediate predecessor; you must accept for the time being the services of a practical president. Four years hence we shall enter upon the fiftieth year of our foundation; meanwhile there is time to establish the principle of educational fitness and assert the privilege of a liberal profession. Should I be fortunate enough to enjoy the confidence of the Institute during the usual period of presidential office, I hope to show that the close union of British architects throughout the world, facilitated by the accepted test of a compulsory examination, is both a possible necessity and a probable fact.

Mr. John Fowler, C.E., proposed a vote of thanks to the President for his address, which he regarded as of peculiar value from its suggestive and practical character. The subjects of science and practice were especially those of the engineer, but were essential as well to the architect, for how could he pronounce as to the condition of a wall alleged to be dangerous, without an intimate knowledge of strains? He was glad that he had recommended, in the papers of the session, the treatment of everyday subjects.

Mr. George Godwin seconded the motion, and remarked that in the tribute paid to the memory of Pugin and of Edward Blore he should have liked to have heard a reference to that great friend to architects and archæologists, John Britton. He was a man emerging from a cellar in Clerkenwell, where he was engaged for years in bottling wine, of little or no education, except what he gave himself, yet he was the foremost amongst those who at that day were producing beautiful sketches and engravings of our ancient buildings, and he led Blore to use his fairy-like pencil in the same work. As to illicit commissions, the loud statements that had been made against architects were perfectly abominable and unfounded. It happened to him to have heard far more of and from architects than any other man in the kingdom, and a more noble, more chivalrous, more high-minded set of men he never met with. An architect was wise if he altogether avoided the taking out of quantities; it was certain to lead him into a false position. As to the proposed compulsory examinations, while he objected to any attempt to make this a close profession, he considered they were taking a wise and proper step in declining to admit members without some guarantee that they were qualified.

The President briefly replied to the vote of thanks, which was carried by acclamation.

THE LAW OF FIXTURES.*

(*Continued from p.* 639.)

It would seem, however, that arguments founded upon the theory in relation to *trade fixtures* still continued to be insisted upon in several subsequent cases, as in 1856 by Vice-Chancellor Wood, in "Mather v. Fraser" (*p*). It may then be assumed that, where the owner of the land and the owner of the fixture are one and the same person, the *intention* presumed by law to have governed the annexation to the soil will be that of permanently improving the inheritance, and no considerations relating to 2. The mode and extent of annexation. 3. The nature and character of the fixture, and the use for which it is intended, will be sufficient to render an article, annexed by the owner of the fee *for the better use or enjoyment* of his property, a "movable fixture," or to give a right of severance to an executor. It is curious to remark the persistency with which successive attempts have been made to force the reconsideration of the question upon the judges in the cases that have followed "Fisher v. Dixon." The authority, however, of that decision has been invariably upheld; and the difficulty relating to fixtures under this head chiefly exists in those cases where the relation of the parties has been held to be analogous to that of heir and executor as between "mortgagor and mortgagee," and between "vendor and purchaser."

To the cases bearing upon these relations I propose shortly to refer, but I desire first to direct your attention to the peculiar nature of a property in fixtures. A right of property in a "movable fixture" is of a composite character, being neither exclusively a chattel interest nor an interest in the realty, properly so called, but partaking of the character of both, and possessing incidents peculiar to itself. The right to sever and remove a fixture relates to the *realty*, so long as the fixture remains annexed to the freehold; but, upon the exercise of the right of severance, the fixture at once assumes the character of a *chattel*, and becomes subject to the law of personal property. A transfer of an interest in land, for example—the mortgage of a term by a tenant for years—will pass the "movable fixtures" without their being expressly included in the mortgage. But, on the other hand, it is competent to the tenant to transfer his right of severance; and this would be a transfer of his chattel interest in the fixtures, for upon the exercise of that right the fixtures cease to be part of the land, and become chattels. The right of property in fixtures is not, therefore, an "interest in land" within the 4th section of the Statute of Frauds (*q*), nor yet "goods, wares, and merchandise," within the terms of the 17th section of the same statute, and agreements relating to the transfer of property in fixtures, not being affected by that statute, need not necessarily be in writing. Under certain circumstances, however, writing is indispensable. The mortgagor of an interest in land is considered in law to indicate by the manner in which he annexes fixtures to the freehold that he regards them as permanently attached to the property *during his interest in the property*. This principle of law applies equally to all cases where an interest in land is the subject of a mortgage. The mortgagor may be owner of the fee or tenant for life or in tail or for a term of years, for in respect of the rights we are discussing it is immaterial what is the *extent* of his interest in the land. When a party having annexed articles to the land in which also he has an interest, either limited or in fee, transfers that interest by way of mortgage, his rights with regard to the "movable fixtures" are analogous to those existing between heir and executor. In some respects, however, the circumstances surrounding this class of cases are peculiar. It will be observed that the phrase "movable fixtures" is used in the principle just laid down, and it will be readily seen that no question of this description could arise unless the mortgagor of the interest in land had also a property in the fixtures which made them a "movable fixtures," or gave a right of severance to him which he was entitled to use at his discretion, and to assign independently of his interest in the land (*r*). In the consideration, therefore, of a question relating to fixtures arising under this head, it must first be determined whether the fixture is "movable" or "irremovable," as between the owner of the fixture and the owner of the fee, and the transfer of fixtures so determined to be "movable" by way of mortgage will be governed by the principle which allows of the slightest degree of annexation, for the purpose of presuming the intention of permanently annexing articles to the freehold—in other words, a degree of annexation similar to that which has been held sufficient to raise such a presumption when the question arises between their heir and executor. Of course, where the owner of the fixture and the owner of the fee are identical, every fixture may be considered a "movable fixture" in the first instance. And it will be seen that in such a case, where the owner of the fee mortgages the freehold, it will be unnecessary to do more than test the character of the fixtures by reference to the law obtaining between heir and executor; for the mortgagee stands, for all practical purposes, in the position of the heir, and invested with the same rights. It is unnecessary to refer to cases earlier than *ex-parte* Cotton (*s*), 1845. The question in this case was, as to the right of a mortgagee in fee to trade fixtures as against the assignees of the mortgagor, the peculiarities of the case being that, after executing a mortgage of the trade premises in fee, the trader entered into partnership, and the firm subsequently carried on business on the premises, and erected trade fixtures. It was held that the mortgagee was entitled to the fixtures, whether erected by the mortgagor or by the partnership.

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* A paper read by J. Smalman Smith, barrister-at-law, before the Institution of Surveyors, Nov. 24, 1879.

The next important case in which *ex-parte* Cotton was followed, was "Walmesley v Milne" (*t*). The main question in the latter case was whether the articles were affixed permanently to the freehold. The language of the chief judge, afterwards Mr. Justice Erskine, in *ex-parte* Belcher (*u*), was there quoted by Mr. Justice Crowder. "Now it always appears to me that where the owner of the inheritance affixes property to it, it becomes a 'fixture' in the general sense of the term, and part of the freehold; and I confess I see no distinction for this purpose whether the deed be one of absolute conveyance, lease, or mortgage. A mortgage, therefore, made by the owner of the inheritance will, without naming them, pass all the fixtures thereon. Again, it is urged that as to those articles which were attached *after* the execution of the mortgage deed, they could not pass to the mortgagee. But there has not been cited any authority, or even dictum, for such a proposition. I confess, I know no case which goes so far as to determine, or even to intimate an opinion that, where a mortgagor in possession alters the premises, by addition or otherwise, the mortgagee shall not take the benefit of such alteration. I can find no distinction, therefore, substantially between those which were affixed *before* and those affixed *after* the date of the mortgage deed. In that point of view also I am of opinion that all the fixtures alike passed to the mortgagee. In the case of "Holland v. Hodgson" (*k*), it is laid down that, since the decision in "Climie v. Wood" (*v*), it must be considered as settled law that what are commonly known as trade or tenant's fixtures, form part of the land, and pass by a conveyance of it, and that though, if the person who erected those fixtures was a tenant with a limited interest in the land, he has a right as against the freeholder to *sever* the *fixtures* from the land, yet, if he be a mortgagor in fee, he has no such right as against his mortgagee. In some cases, such as the anchor of a ship, or the ordinary instance given of a carpet nailed to the floor of a room, the nature of the thing sufficiently shows that it is only fastened as a chattel temporarily, and not affixed permanently as part of the land. But ordinary trade or tenant fixtures, which are put up with the intention that they should be removed by the tenant, and certainly not for the purpose of improving the reversionary interest of the landlord, have always been considered as part of the land, though severable by the tenant. Thus, a portable engine and boiler brought on to colliery premises to be used in sinking a new shaft, and for the purpose of steadying the machinery, bolted to a wooden framework, and then the frame imbedded in a layer of mortar, laid upon a brick foundation, pass to the mortgagee of the realty, and cannot be seized by the judgment creditors of the mortgagor (*w*). The principles of law which have been unanimously accepted, and rarely dissented from, establish the following general propositions:—That a mortgage of an interest in land will pass the "movable fixtures" without express mention. That fixtures annexed after the date of the mortgage pass to the mortgagee. That fixtures annexed to the freehold after the date of the mortgage by parties other than the mortgagor, as a partnership, but for a similar purpose, pass to the mortgagee.

A mortgage of fixtures, in order to avail against the claim of a trustee in bankruptcy, or an execution creditor, must, in certain cases, be registered as a bill of sale of personal chattels. Previous to 1878, a series of decisions had established the principle that where the mortgage deed contains an express assignment of the fixtures, or of the right to sever or dispose of the fixtures apart from the interest in land, or purports to convey a greater interest in the fixtures than the mortgagor has in the land, or to convey the fixtures in any form as a distinct subject matter, the deed will require registration under the Bills of Sale Act, 17 and 18 Vict., c. 36, as a bill of sale of "personal chattels," otherwise it will not avail against the execution creditor or creditors in bankruptcy (*x*). The law, as thus established, will continue to prevail, except with regard to "machinery used in, or attached to, any factory or workshop." By the Bills of Sale Act, 1878, machinery of this character, which is termed "trade machinery," and in the Act expressly defined, is constituted a distinct class of fixtures for the purposes of the Act. On and after the 1st of January, 1879, "trade machinery," however conveyed, whether expressly mentioned or otherwise in the conveyance or mortgage deed, if suffered to remain in the apparent possession of the mortgagor, is in all cases to be considered *personal chattels*, and the deed will require registration as a bill of sale of personal chattels in order to avail as against the execution creditor or trustee in bankruptcy. A mortgage of "movable fixtures," not included in this category, such as for ornament or domestic use, or for ordinary trade purposes, will still continue to be governed by the law as existing previous to the Act. With regard to the transfer of fixtures by way of sale, the general rule of law is that everything which is actually or constructively annexed to the freehold at the time of the sale passes with a conveyance of the freehold, unless there is anything to indicate a contrary intention. As in the case where the owner of a freehold house, in which were various fixtures, such as stoves, grates, kitchen-ranges, closets, shelves, brewing-coppers, cooling-coppers, mash-tubs, locks, bolts, blinds, &c., sold it by auction, when no mention was made of the fixtures. The defendant became the purchaser, the house and estate was conveyed to him, and possession given, these articles still remaining in the house. The plaintiff afterwards desired that a valuation of them should be made, and that defendant should pay for them according to it; the latter contended that they belonged to him together with the freehold, and refused to pay for them, or deliver them up. It was held that they passed by a conveyance of the freehold (*y*). Agreements for the sale of freehold premises often contain a stipulation that the *fixtures shall be taken at a valuation*; and the articles thus indicated, unless they are scheduled, and expressly enumerated, will be such articles as would be "movable fixtures" between heir and executor. It is, however, in all cases advisable to schedule the fixtures for valuation. Such a schedule, it must be remembered, will have the effect of excluding from the valuation any fixtures not mentioned therein, upon the principle *expressio unius est exclusio alterino*, and the conveyance will pass all other articles remaining on the premises at the time of the sale, and either actually or constructively annexed to the freehold.

We will next consider the questions arising between the executor of the tenant for life or in tail, and the remainder-man or reversioner. The claim of the executor or personal representative of a deceased tenant for life or in tail to a right of severance and removal of articles annexed to the soil by the tenant of such a limited estate in his lifetime as against the remainder-man or reversioner now becomes the subject of examination.

With regard to the position of the parties, a tenant for life or in tail cannot, generally speaking, be supposed to be so deeply interested in the permanent benefit of the freehold as the owner of the fee. In this latter case the question arises between representatives of the same owner of the inheritance, whose interests are often identical. But in the former case, after the death of the tenant of the particular estate, the freehold may pass to a remote remainder-man or a reversioner, whilst his personal property only would pass to those with whose interests he was closely identified in his lifetime. The position of the parties which we are now discussing is one between two extremes—an "intermediate case," as Lord Hobart (*z*) calls it—where the interests of the different claimants can neither be supposed to be invariably in accord nor yet invariably distinct. It is presumed in law that such a tenant of a particular estate would not make annexations to the freehold with the intention of advantaging a remote remainder-man or reversioner to the detriment of his own immediate representatives; and it may be doubted whether there exists any real distinction in respect of a right of severance between the "position of the parties" under this head and under that of landlord and tenant. Lord Hardwicke says:—"The situation of a tenant for life comes nearer to that of a common tenant" (*z*); and Lord Mansfield says (*z*)—alluding to a valuable and expensive erection set up by a tenant for life:—"It is but reasonable that it should be taken away. A tenant for life has the same argument for so doing as a tenant for years has." Also, in the later case of "Dudley v. Warde" (a^1), Lord Hardwicke says:—"The case being between executor and tenant for life in tail and a remainder-man, is not quite so strong as between landlord and tenant, yet the same reason governs it." And in regard to an estate in tail, he says:—"If it is so in the case of tenant for life, *quære* how it would be in the case of tenant in tail? Tenant in tail has but a particular estate, though somewhat higher than tenant for life. In the reason of the thing there is no material difference." This case (*z*) was decided by Lord Hardwicke in 1740. The material question in the case was whether a steam-engine set up for the benefit of a colliery by a tenant for life should be considered as personal estate and go to his executor, or fixed to the freehold and go to the remainder-man. It was held that the engine was personal estate, and should go to the executor for the increase of assets in favour of creditors, and not to the remainder-man. In "D'Eyncourt v. Gregory" (*m*), Lord Romilly, Master of the Rolls, held that, as between tenant for life and remainder-man, tapestry forming covering of the walls was an irremovable fixture, and also that any article forming a portion of the architectural design of a house, although merely resting by its own weight, was irremovable by the personal representatives of the tenant for life. In this case the articles in question were sculptured figures resting upon a stone base, and not otherwise attached to the soil. Lord Romilly said:—"I should consider that they could not properly be removed although fixed without cement and resting by their own weight alone. In such a case the question is not whether the thing itself is easily removable, but whether it is essentially part of the building." In order to render the fixtures "movable," and thus contribute to support the presumption that the annexation was not made for the *permanent benefit of the freehold*, it must be ascertained whether the fixture can be removed without material and permanent injury to the freehold; the doctrine of *constructive annexation* must also be here considered, as to whether the article in question is accessory to any principal thing which would be rendered useless by its removal, and of the character of which the accessory must necessarily partake. Furthermore, in order to render the fixture "movable," it must still retain the character of a chattel, although annexed to the soil, and be capable of a separate use as a chattel. It has been also laid down by Lord Hardwicke, and affirmed by subsequent authorities, that fixtures intended for use in *trade*, or for the better enjoyment of the profits of the land, will in general be movable. The most definitive principle that can with safety be laid down as the result of the cases already quoted may be thus stated :—An estate for life or in tail is an estate of the same nature, but of a higher character than an estate for years; and for all practical purposes, with regard to annexations to the soil, the legal presumption as to the *intention* of a tenant for life or in tail in annexing articles to the soil will be governed by the same rules as would prevail between landlord and tenant under similar circumstances; but in a nicely balanced question where the presumption in favour of *an intention to permanently benefit the freehold* is barely strong enough to be construed in favour of annexation to the soil, the position of the parties now under consideration will turn that presumption in favour of the realty.

Authorities Cited.

[For other cases quoted see similar list at end of first part of paper, p. 639.]

(*p*) Mather v. Fraser, 2 K. and J. ch. 536. *See* also ex-parte Cotton 2 M.D. and De G. 725; Boyd v. Shorrock, 37 L. J. ch. 144; Culwick v. Swindell, 3 L. R. Eq. 249.

(*q*) 29 Car. 2, c. 3.

(*r*) Gawan v. Barclay, 4 W. R. 80.

(*s*) Ex-parte Cotton, 2 M.D. and De G. 725.

(*t*) Walmesly v. Milne, 7 C. B N. S. 115.

(*u*) Ex-parte Belcher, 2 M. and Ayr 160.

(*v*) Climie v. Wood, 3 L. R. Ex. 257.

(*w*) Cross v. Barnes, 46 L. J. Q. B. D, 36 L. T. N. S. 693.

(*x*) Ex-parte Daglish, 8 L. R. Ch., 1,072; Hawtrey v. Butlin, 8 L. R. Q. B. 290; Ex-parte Barclay, 9 L. R. Ch. 609; Meux and Others v. Jacob, 7 L. R. H. of L C. 481; Exp. Tweedie in re Trethowan, 5 L. R. Ch. D. 559; 46 L. J. Bank, 43 C. J. B.; Ex-parte Eslick in re Alexander, 4 L. R. Ch. Div. 503; 46 L. J. Bank, 30.

(*y*) Colgrave v. Dias Santos, 2 B. and C. 76.

(*z*) Lawton v. Lawton, 3 Atk. 13.

(*a*¹) Dudley v. Warde, 1 Ambler 113.

(*To be Continued.*)

FIREPROOF BUILDING.

AN address upon a subject of considerable moment comes to us in the shape of a pamphlet published in New York. It is upon the "Relation of Architecture to Underwriting," and was lately delivered before the New York State Association of Supervising Agents, by Mr. P. B. Wight, of Chicago, consulting architect. Just now the subject has an appropriate significance in large towns, and many of the remarks of the author have as direct an interest to builders here as in America. Thus Mr. Wight treats of those systems of building which are least dangerous as regards both the inception and spreading of fires. He starts from a sound principle, that though we rate a building according to its supposed risk in case of fire, we desire that risk to be as low as possible; any other supposition, as he observes, would be based upon the idea that insurance was a species of gambling, rather than a science based on general averages. Large fires, of course, have to be avoided, and it is therefore desirable to obviate the chances of their extension. Two causes, we are told, promote this: "one is the rapid consumption of the materials of the building, the other the rapid spread of fire through a building assisted by the combustion of its contents. The one is prevented by the use of incombustible materials, the other by the separation of the several parts by natural barriers; the former is generally known as fireproof building, the latter as the compartment system." The author proceeds, therefore, to describe "fireproof" building, but draws a very necessary distinction. He classes fireproof buildings under two heads: the first class as that constructed of incombustible materials thoroughly protected from the action of fire, the second as buildings constructed partially of combustible materials, also thoroughly protected. The former class involves more expensive processes than the latter, and it is more durable against decay and deterioration, though the fire-resisting qualities may be the same in both. The author observes what is already pretty well understood by architects who have had experience—that more depends upon the *protection* of the materials of construction than upon the materials themselves; but there is still an idea, says the author, that incombustible materials alone can make a fireproof building. It may be well to remind those who entertain this opinion that, with the "exception of brick there is no material that enters into the construction of modern buildings that can be considered fireproof"; and it is impossible that the contents of any building can be wholly so. It is absurd, therefore, to assume a building is fireproof unless all its contents are incombustible. In considering what constitutes a fireproof building of the first class, the author takes brick as the standard for fire-resisting qualities necessary, which of course includes terra-cotta. Next to brick, walls built of concrete are considered as nearly equal to it, but nothing is said about the kind of concrete to be used. Mr. Wight does not agree in his views with Captain Shaw, C.B., who, we believe, has not spoken favourably of stone-faced brick walls, but observes that "exterior stone facing on brick walls does not materially affect their fireproof qualities, though there are but few natural stones that have any fire-resisting qualities." And, again, the author says, "no wall built entirely of stone can be considered fireproof." In speaking of the structural materials of buildings of this class, the author does not suggest any new mode, but passes in review the methods already in use to insure fire-resisting construction. Of course, in a first-class fireproof building the amount of insurable property depends on the amount of combustible materials, and, referring to iron, F. Schumann, the mechanical expert of the office of the supervising architect of the Treasury Department, says that iron, with a co-efficient of safety of three at normal temperature, loses all practicable strength at 977 Fahr. Iron must, therefore, be protected by incombustible and non-conducting materials. Referring to the various methods of bridging the spaces between the iron beams, the brick arch is considered the strongest and cheapest; but there is the difficulty of obtaining a flat ceiling and at the same time protecting the lower flanges. Suspended ceilings of incombustible materials are suggested, the flanges being protected by wire netting or small bars of iron covered with plaster; but the most effective method is to use large skewbacks of brick or concrete, so that the beam may be inclosed below, the best material for the skewbacks and arches being porous terra-cotta, or clay and sawdust burned like ordinary bricks. This system has been carried out, we find, at the Mitchell Building, Milwaukee. Arches of corrugated iron resting on the flanges and filled with concrete have been used successfully for a similar purpose, but it leaves the lower part of the iron beams exposed. Allusion is made to flat arches of hollow bricks, another mode of filling in the spaces; the joints are made to radiate to a common centre, and the soffits of the arches afford a protection to the flanges of beams. Plastering covers the whole ceiling throughout, and the porous concrete may be made of lime of Teil and plaster of Paris. Iron columns should be covered in a similar manner by porous terra-cotta or concrete cast in blocks. Screws put directly into the iron is recommended for securing the material. Another mode is to form vertical flanges in the column between which blocks are introduced, and the whole covered by plaster. Partitions of porous concrete or hollow bricks are necessary to insure fire-resisting qualities. The author discusses the essentials of roof-trusses, and the importance of covering the iron purlins with blocks of porous concrete. He observes that sheet-metal, in all forms, should be sparingly introduced; and, as a general principle, assumes that the only building materials that will resist fire are those which are solid and porous; porosity gives the nonconducting property, while brittle materials are all unreliable as fire-resisters.

Fireproof buildings of the second class, or those in which combustible materials are used, but protected from the action of a fire, are next considered by Mr. Wight, and, we may observe, are a larger and more important class for the consideration of the architect. Some valuable hints are given by the writer. Thus, in warehouses having long unsupported walls, a system of buttressing may be adopted by the flues, the amount of brickwork displaced by a flue being disposed on each side. The author says he has adopted this rule in Chicago since the great fire. The plan of filling the spaces between wooden floor-beams solid is objected to as accumulating weight and inducing decay of the timber. A separate ceiling and floor are advocated, and the former should be so constructed as to keep the fire from the beams. For this purpose the author recommends wire, either woven or strung, as a support for the plastering; the mortar is forced through the meshes and above the wires, and makes a good resisting covering. The thickness altogether, including the finishing coat of mortar, may be about 1½in. Another method of constructing economical fire-proof ceilings is by using hollow slabs of fireclay. In covering iron beams of I section, Mr. Wight suggests laying beams of oak, one on each side, and one on the bottom of it, worked to fit solidly to the iron, and then secured by bolts. We have no further space to go into details. Another section of Mr. Wight's address deals with perhaps quite as important a subject—means to prevent or control the spread of fire. Of course the division of a building into compartments is the means taken to insure the prevention of the rapid spread of fire. Open elevator wells, staircases, and other shafts are particularly dangerous as vertical openings. The author truly observes, the use of trap doors has been disused since the improvements made in the machinery of elevators. Several patent automatic hatchway valves or traps have been introduced in America, but few have been put into use. No doubt much might be looked for if automatic closers were made compulsory by authorities and insurance offices, and if all buildings were properly sub-divided by fireproof partitions, with double iron doors to all openings. We cordially recommend Mr. Wight's remarks to the notice of all architects.

MR. RUSKIN AND ST. MARK'S, VENICE.*

By T. H. Hall Caine.

WHEN the intelligence came to us from Italy that, unless protected from the rapacity of those by whom the beauty it possesses is unfelt, and the language it uses forgotten, the west front of the Church of St. Mark, at Venice, was to be taken down and rebuilt, did we not at first feel that the author of the "Stones of Venice" was the man, above all living men, who might, and must, speak the word of fervid protest that waited to be spoken? He who knew that pile of Oriental glory as no man else had learned to know it; had numbered its chequered stones as he might have counted the jewels of a crown; had traced its coral and its amethyst, and every star of its opal gleaming on its golden ground; he who felt that Jehovah had made his tablets of the marble of that Venetian temple as certainly as of the granite of Sinai, was of all men the man to say how far its destruction, under the name of restoration, would be subversive of our interests in that past of Italy, and of the world, whose history—where its printed pages fail us—the very stones cry out. But friends of Mr. Ruskin well know the sad truth that, for reasons both adequate and painful, and such as a generous public will be quick to appreciate, he must be silent on this subject. "I have, of course, the deepest interest in your work," writes Mr. Ruskin, "and for that reason must keep wholly out of it." The movement against all this destruction, and worse than destruction, of the art-treasures of an elder time, that has been going on in Europe for the most part of half a century, is being sustained by Mr. William Morris and others—men whose generating instincts have assuredly infused such a spirit into the very fibre of our modern art-life as has brought it to where it is. But neither can we measure the loss to the past of art, nor to its future, which comes of the circumstance, that when the temple which for centuries has given joy to East and West alike is threatened with partial demolition, silence must lie on the lips of him whose distinguishing gift, a supreme birth-possession above all or most of the men of his time, is a wonderfully subtle apprehension of all beauty of form wrought by the hand of the architect. Nevertheless, Mr. Ruskin has, in a sense, left behind him in ineffaceable characters the symbol of his sympathies in this matter. If he who for thirty years stood at the head and front of this movement may no longer charge himself with direct effort in its interests, we who rejoice to be of his following may yet find there remains to us adequate data whereby to work. Permit me, then, at this juncture—without asking the praise of deeper insight than the most or even profounder sympathy, and claiming only to have traversed the works with more special purpose—to focus in a few short pages much of all Mr. Ruskin has said since 1848 on St. Mark's and its restoration, and on the principle and practice of all modern restoration, in many books and pamphlets, some of them unknown to all but bibliographers, and now unhappily not usually accessible.

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* Read at the Liverpool Free Library, Dec. 2, 1879.

What Mr. Ruskin sees first of all, is that the history of St. Mark's is the history of Venice—of its origin in the days of Byzantine art, its culminating height in the Gothic period, its degeneracy into what is termed its Renaissance, and at last its final overthrow as a centre towards which had, for a time, radiated the full soul of Christendom. The Venetians were exiles from ancient and beautiful cities, when with small beginnings they founded on the banks of the broad Adriatic their Venice of porphyry and gold. They brought with them rich memories of the half-barbaric Eastern splendours from whose presence they were banished. They brought, too, relics of many an antique pile, such as for ages had prompted their fathers to reflection, or pleaded for regard. These they incrustated with less precious material, and thus established a great school of art that was sincere and pure, and true to the period and the place. Very soon their refuge became their home. Venice bred a Giorgione, a Titian, a Bellini, and a Tintoretto. Her school of Venetian painters founded abiding traditions. Painting may never in this world escape from the influence of her beginnings: its latest noble efforts are linked to her first. For fifteen hundred years Venice was a sovereign power; for a thousand years she swayed the councils of Europe. Her fleets were in every water, her consuls were in every province, and the wealth of East and West met in her treasury. But her evil day came at length. A fatal change stripped her of her sovereignty—her rule was abrogated; her fleets superseded; her treasures spoliated; her temples desecrated. In the wantonness of wealth Venice made her choice whether she should be for God or for mammon, and now is despoiled and overthrown. Europe yields her only the last funeral offices of memory.

Next, Mr. Ruskin shows how the church of St. Mark came to be what it was and is. The Venetians believed they had become possessed of the body of the Apostle. They reared a church to mark its resting-place. The church was destroyed by fire, and on its site in the 11th century they reared another church and decorated it with the symbol of the Apostle, and named it by his name. Mr. Ruskin revives some of the traditions that link themselves with its history. Amidst the fever of excitement and passion of pursuit that attended the building of the fabric, the precise resting-place of the body of the Apostle became lost. In this hour of humiliation the people set aside a period for prayer and fasting, and in the midst of it the stones of a column in their sanctuary parted, and disclosed the coffin of the Apostle safely embosomed within it. St. Mark's was completed by the Byzantines about 1071, and was then the purest example of their art. The Pagan splendours of its decoration, wrought by craftsmen from Constantinople, was unperplexed by any effort at naturalism, and always subordinate to architectural effect. Every generation added something to the glory of its colour, and the wealth of its mosaics; but not in any age did it inherit much more of human expression or of religious mysticism than characterised its barbaric beginning. When the great soul of Christian art required to beat itself out in more truly satisfying expression, it left St. Mark's at Venice for the cathedral at Rouen. St. Mark's was partially burnt in 1106, and from that time forward until the dawn of the Renaissance, we mark the light hand of the Gothicist touching its pinnacles with exquisite ornament, and its retiring niches with delicate tracery. Sweet and tender and pensive is the work of the Gothic builder, as in the form of flowers and leaves, and graceful birds that drink in this thirsty land from sunny fountains, it interwines with the dragons and serpents and ravening beasts of prey of Byzantine art. And the temple feels and is glad of it, and over all its crust of marble and more precious stones, finds joy in the gentle fractures traced on the face of them by the heirs of a noble Christian architecture in its youth. Not in the same manner did Titian in later days incrustate into St. Mark's his colourless Renaissance. Titian did much for St. Mark's in the morsels of actual life, and in the Bible pictures with which he adorned its walls; he did much for Venice in teaching her school of painters the scope of their art—how much in a picture is pictorial; how far a picture must be before all else decorative—and now the dust lies on his lips; but we should not leave the truth unstated that he stripped from this ancient fabric the loveliest remains brightened by coral and gold to make space for the drear inanities of a false and dishonouring substitute.

But if we would wish to see the church of St. Mark's, at Venice, as Mr. Ruskin sees it, we must begin with him in the Calle Lunga San Moise, an alley seven feet wide, between high over-reaching houses, paved under foot, and with its narrow stream of blue sky overhead. This outwork to a great square is dense, and its itinerant vendors, foul with their goods and hoarse with their cries. We push through the dust and noise, past the hostelry of the Black Eagle, and emerge on the bridge of Campo san Moise, whence—following where Mr. Ruskin leads—into the entrance into St. Mark's-place, known as Bocca di Piazza. We pass through the shadow of its pillars, and as we advance slowly there opens upon us a great light, for beyond those groups of arches there rises a vision out of the earth, and the great square parts from it in a kind of awe that we may see it far away. White cupolas rise like wreaths of sea-foam in the dawn; seven-fold gates are flanked with clusters of pillars, and white doves nestle in their capitals; higher up the images of Christ and His angels look out from spandrels, where opal and amethyst gleam in the sun with unexpected rays; still higher, pinnacles, touched with partial but not dangerous decay, stand out before arches wide and old, and splendid is their sweep; again higher a line of yet more beautiful pinnacles; then up ahead, the glowing domes that seem to lift themselves nobly forth from their bed of marble and gold. As we stand for one consummate moment in full view of this symbol of a strange and perfect chemistry uniting—in the consistency of true art penetrated by the imposing spirit of the artist—contrasted elements, we cannot but see in it an indwelling solemnity of expression which for centuries—whether men would bear or whether they would forbear—must have been rebuking to frivolity and chastening to pleasure. When we turn our backs upon these gleaming walls, and the vast square seems to close upon us as we go, the vesper hymn streams through the open portal within whose swinging gates the incense of prayer and praise goes up to God. It pursues us as we re-enter the shadows of the Bocca di Piazza, and mingles with the oncoming din of the narrow alley across the bridge—mingles with it, and then is lost.

And this is the temple our Italian government proposes to restore? What does Mr. Ruskin say about it? That, once destroyed, we may restore the church of St. Mark's at Venice when we can raise the dead—not till then. He tells us there is no such thing as restoration. From beginning to end the thing is a lie no honest man may give tongue to. It means total destruction; a destruction out of which no remnants may be gathered. You may make a model of the old building, as you may of a corpse; but wherein is your new work better than the old? There is yet in the old some life, some mysterious suggestions of what it has been and what it has lost. But—it may be answered—beauty is less than utility, and if the west front of St. Mark's is tottering to its fall—what then? Then this,—that better authorities, Mr. Street and others, have announced the façade secure than any who have labelled it dangerous. This restoration has been going on for years, and irreparable injury is already done. Hundreds of workmen, without a touch of the feeling, intention, and information of the freemasons of the 12th Century have long been destroying in carelessness, or in cunning, what it would have been inconvenient to save or difficult to imitate. Mr. Ruskin says he would rather leave it to others than himself to say how far, when repairs are once permitted to be undertaken, a building is likely to be spared from mere interest in its beauty, when its destruction has become permanently remunerative to a large body of workmen. But, granted that rain and swirling winds, even in that sunny land, have touched St. Mark's with dangerous decay, he would say to Italians: Take proper care of your monument, and you will not need to restore it; band it together with iron where it loosens; stay it with timber where it declines; do not care about the unsightliness of the aid, and many a generation may yet be born and pass away amidst its shadows. In any case you have no right whatever to touch it; it is not yours: the dead have still their right in it; it is *vested* in you only.

It may be urged that it is impossible that works destructive of the artistic and historical character of St. Mark's can be undertaken without due consideration by the heirs of the men who built it. To this, the reply of Mr. Ruskin is emphatic. He tells us, if we examine the direction which is taken by all the influence of fortune and of fancy in France and Italy, wherever they concern themselves about art, we will find that the real earnest efforts of the upper classes is to make every place in the world as much like the Champs Elysées of Paris as possible. Gay promenades, with fountains and statues; vast hotels like barracks, and rows of high square-windowed dwelling houses, consume their way through the wrecks of the hated antiquities of great cities. What effect has the splendour of St. Mark's on those who now pass beneath it? "You may walk," says Mr. Ruskin, "from sunrise to sunset, to and fro, before its gateway, and you will not see an eye lifted to it nor a countenance brightened by it." Truly, Venice made her choice whether she should be for God or for mammon. Cafés line the square; an Austrian band plays martial music from the foot of the great tower; men gather there in the restlessness of avarice and thirst of delight; the march drowns the Miserere, and the images of Christ and His angels look down upon it all continually. In her last hours Venice has thrown off all shame; and this is how the sons of Dante and Titian insult their fathers with forgetfulness and surround their children with temptation.

Again, it may be urged that we, of all men from all countries of the earth, have least title to dictate to Italy what she shall do with her monuments. Our own cathedrals, once grey and venerable, are now white with novelty or bedizened with vulgarity. The treasures of many centuries lie rotting in damp cellars of our British Museum. Disencumbered of our memorial marbles, we are freed indeed from the entanglements of memory, and now, almost without a record or a ruin, we might dispose ourselves to eat, to drink, and to die. If this is urged against us Mr. Ruskin answers sadly, it is so; and truly, as an Englishman, I know of no ground on which we—paralysed by the remembrance of past errors—may claim to be heard on this subject, unless it be the ground of that individual possession which every man in the world retains, without distinction of nation or race, in all works of inspired art which bring food to the heart and rapture to the sense.

But is it possible that Englishmen can concern themselves to preserve buildings which in their lifetime they may never behold? Mr. Ruskin says it is not absurd to suppose that men are capable of doing this. The love of art is not a selfish principle, nor are its emotions incompatible with the exertions of self-denial.

It may be retorted that in recent years Italy has had more need of her Garibaldis than of her Michael Angelos; but shall it henceforth be said that amidst the din and bustle of her reawakening from the sleep of years a great nation has been unmindful of her past—a past full of noble achievements whose memory the world will never let die? But on Italy and the Italians that world will one day give judgment. Each, then, shall have a reward. The one, the enthusiasm of students; the other, the concurrence of the crowd. Everywhere now the feverish influence of modern society has sway: but when the dust and noise of so much meddling have passed away, it will then be seen in the silence of her night—tormented by the consciousness of a buried past and saddened by shadows of a barren future—that not the ravages of war or revolt have done so much to efface in Italy the footprints of departed greatness as the feeble vanities of a degenerate generation.

Extensive drainage and sanitary works are about to be commenced at Garristown, from the designs and under the supervision of Mr. James Dillon, C.E., of Dublin, in order to provide employment during the winter.

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ILLUSTRATIONS.

THE TEMPLE CHURCH.—DESIGNS FOR THE CITY OF LONDON SCHOOLS.—ST. JOHN'S CHURCH, WENTBRIDGE.—DESIGN FOR A COUNTRY HOUSE.

OUR LITHOGRAPHIC ILLUSTRATIONS.

TEMPLE CHURCH, LONDON.

On July 3rd, 1874, we gave a double-page view of the Temple Church, as restored with its present high-pitch roof, which was designed some years since by Mr. J. P. St. Aubyn. To-day we publish part of a series of measured drawings (which we propose to complete at an early date) of this building, by Mr. Geo. E. S. Langford, architect. Our plates to-day show the longitudinal section of the entire church, and a perspective sketch of porch at the west end, the bases now covered being cleared in our illustration.

CITY OF LONDON SCHOOL COMPETITION DESIGNS.

The design for the City of London Schools under the motto "Palmam qui meruit ferat" is planned with the Assemby Hall in the centre of the building, its axis being north and south. The whole of the administrative department is arranged on the front of the site, extending from the existing hotel to the proposed new side-road, and the class-rooms, lecture-theatre, &c., arranged on the east and west side of the hall, from which they are separated by a corridor 7ft. 6in. wide. The accommodation provided is as follows: — Secretary's offices adjoining the entrance, provided with the requisite lavatory, w.c., safe, &c. A committee-room 29ft. by 21ft. adjoining, and near the entrance. A library 37ft. 9in. by 19ft., at the south-west angle of the angle, and forming a convenient waiting-room for visitors either to the head-master or to the committee. A head master's-room 28ft. by 19ft., provided with w.c. and lavatory. The whole of these rooms are *en suite*, and all have a river frontage. The common-room for the assistant master, 36ft. by 19ft., is placed at the south-east angle of the building, communicating with an ante-room, and provided with w.c.'s and lavatory. A porter's room situate on the right side of the entrance-hall, with a store for books in rear. The dining-hall is placed on the first floor, with accommodation for 200 boys. The kitchen, scullery, larder, four living-rooms, and offices for porter's family and kitchen staff are on the second floor, immediately over the dining-hall. A furnace-room, and coal and other stores, are provided in the basement. Twenty class-rooms are provided (8 on ground-floor, 12 on first floor), each to accommodate 40 boys, and ten of the class-rooms are provided with sliding partitions, impervious to sound; the whole 20 class-rooms are lighted from the side, 15 of them having a left-side light, and, in addition, the 4 class-rooms on first floor of east wing have top lights to admit of their occasional use as drawing class-room. The minimum provision of lighting is about 300 square inches of window-surface for each pupil. The dimensions of the class-rooms are so devised that they will admit of either dual or long desks being used. Each class-room is provided with a chamber for hats and coats, fitted with special arrangements for airing and drying the clothes, and, to secure greater quiet and privacy, each class-room is entered from a lobby communicating with the hat chamber and general corridors. The assembly hall is 92ft. by 60ft., arranged to seat 1,007 persons, in addition to 160 seats in a shallow south gallery, and has the main corridors running round three sides, with which it communicates by ten doors. It is provided with a platform suitable for prize distribution, &c., and with retiring-rooms in the rear. The lighting of the hall is arranged near the ceiling. A practical chemistry laboratory, 46ft. by 19ft., an extra class-room, 38ft. by 19ft.; a lecture-theatre, 70ft. by 30ft., to seat 400 boys; a private room for the lecturer, adjoining the lecture-theatre, and a best apparatus-room are provided on the second floor, on the west side of the hall. The principal entrance is in the centre of the Thames Embankment frontage into a hall 29ft. square, from which every part of the building is directly accessible, either by corridors or stairs. The corridors are continued on each floor by covered ways to the w.c.'s, lavatories, &c., placed in a distinct block, 30ft. in rear of main buildings, and separated therefrom by an open area. The general warming of the building was proposed to be effected by the circulation of hot water, and the special warming of the class-rooms by open-fire ventilating-stoves. The lobbies and corridors are lighted over the low screen at front of the hat and coat lobbies, and these lights, occurring at short intervals, are supplemented by numerous windows. With a view of economising both space and cost, covered playgrounds have been arranged underneath a portion of the building. The total covered playground amounts to over a quarter of an acre, and the total covered and uncovered playground is more than an acre in extent. It was proposed to construct the foundation, interior, and the back and east elevations of gault bricks, the front and west elevations, the principal staircase and the dressing to windows being in stone; the floors of corridors and lavatories and the back stairs to be fireproof, the roofs to have iron principals and purlins with best yellow fir rafters, and to be boarded, felted, and covered with Welsh slates; the dome to be covered with stamped copper sheets. The design was cubed out at 5d. per foot for all work below the ground-floor, and at 10d. per foot for all above that level, or an average price of $8\frac{3}{4}$d. per foot for the whole work. The entire cost of carrying out the works as here described, including foundations to an average depth of 6ft. below the existing surface of the site, is estimated at £53,000. The authors of the design are Messrs. J. T. Newman and William Jacques, architects, 2, Fen-court, Fenchurch-street, E.C.

Another design for these schools, illustrated this week, was submitted under the motto, "Our Boys." The schools being founded by John Carpenter, in 1440, determined the author to adopt the style of architecture prevalent at this period, and illustrated by King's College, Cambridge, and Eton College, both of which were founded at the same time. In plan, the buildings surround an internal quadrangle, the great hall being placed at the north-west end, and abutting on the proposed new street. Entering from the Embankment, a vestibule leads on the ground-floor to a large assembly-hall. which gives access on the right to the porter's and secretaries' offices, and on the left to waiting-room, library, and head-master's room, under the tower, which communicates with his class-room. There are also entrances, on each hand, to the corridors, from which open out the class-rooms and masters' common room. The great hall forms the end of the quadrangle, with the dining-hall, on the opposide side of the corridor, at the end. The lecture-hall occupies the centre of the Embankment-front, on the first and second floors, and communicates, through the laboratory and best apparatus room, to the chemical class-room, which is lighted on three sides, with an open roof. A drawing class-room is provided on the second floor. The class-rooms are placed on each side of the quadrangle on the two upper floors. There are three staircases; at the foot of each, in the basement, are lavatories communicating with latrines. Almost the whole of the basement, except under the front portion, is devoted to a covered playground, and a part of the quadrangle, below the ground-floor windows, is roofed as a covered gymnasium, and the remainder of the site, about 100ft. in depth, is left as an open playground. The estimated cost of the building is £57,500. The objects sought to be attained in the design were the division of the buildings for the purposes of classification and supervision, ample light and through ventilation to all rooms, and easy circulation by means of direct and wide corridors; an imposing great hall, convenient of access, and an architectural building worthy of the site. The architect is Mr. J. Douglass Mathews, F.R.I.B.A., of Cloak-lane, assisted by Mr. J. S. Quilter.

We may remind our readers that the selected design for the schools, that of Messrs. Davis and Emanuel, was illustrated in the Building News for June 13, August 15 and 22 of the present year; Mr. T. E. Collcutt's design on September 5 last, and that by Messrs. Oliver and Leeson on September 12. In an early issue we shall publish Mr. Knightley's design, which was placed second in the competition.

CHURCH OF ST. JOHN THE EVANGELIST, WENTBRIDGE, YORKS.

We have already published Mr. Arthur W. Blomfield's big drawing of Denton Hall from this year's Royal Academy Exhibition, and to-day we are enabled to give the only other drawing exhibited at the same exhibition by the same architect, viz., the Church of St. John the Evangelist, Wentbridge, Yorkshire. As will be seen by the plan, the building is cruciform, and has an apsidal chancel. The materials are local stone for the walls, and tiles for the roofs.

DESIGN FOR A COUNTRY HOUSE.

This illustration has been reproduced from Mr. J. Langham's Royal Academy drawing from this year's Exhibition. It is simply a design prepared as an example of a suitable domestic treatment of brick and stone combined with half-timber construction, and as such it will be of interest to our readers. A plan is given, which will explain the arrangements of the interior.

◆

CHIPS.

The foundation-stone of the permanent structure for Gresham Baptist Chapel, opposite Loughborough-park railway station, S.E., was laid on Tuesday week. The building is being erected from the designs, and under the supervision of, Mr. Sanders, of Stockwell, at an estimated cost of £2,000. According to the *South London Observer*, "its style will be a blending of the Norman and the Gothic;" the pews will be of pitch-pine, and the roof of deal, stained, with plaster interlaid.

The decoration, in colour, of the interior of the Town Hall at Peterhead, N.B., has just been completed. The work has been carried out by Mr. Ferguson, of that burgh, and, at the same time, all the woodwork in the principal hall has been renewed, new windows introduced, and fresh council-table, cushioned chairs, and other fittings placed in the room.

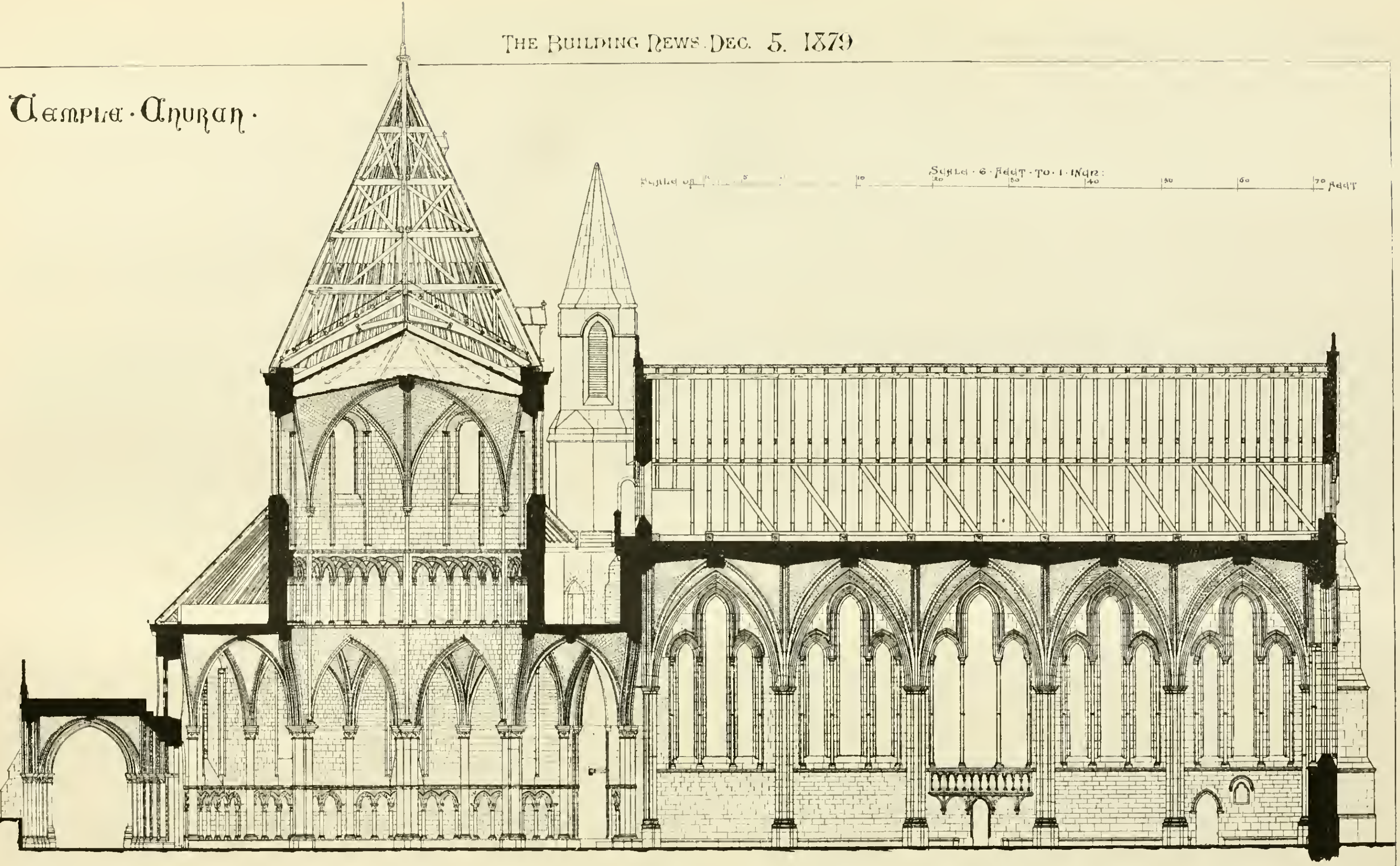
A private meeting of the Trustees of Maryport was held on Friday to consider tenders for the construction of the new dock. Twenty-five were opened, and were sent to Sir John Hawkshaw, the engineer, to report upon; the amounts were not divulged.

The chancel of Wadsham Church, Somersetshire, has just been restored, from the designs of Mr. Ewan Christian. It has received a new roof, of open deal ribs, without stain or varnish, and covered with Cornish slates, with a Hamhill ridging and new cross to gable. The increased height given to the roof makes the "leaning" to the south from the line of nave more conspicuous than formerly. The stone-work of windows has been renewed, three being reglazed in green quarries with plain borders, the floor laid with Minton's tiles, new oak seats erected, and a drain carried round exterior of this portion of building. The contractor was Mr. M. Davies, of Landport, except for the tiles, which were laid by Mr. Preston, of Ilminster.

Mr. Frank N. Pettingell is at present engaged upon a large bird's-eye view of the proposed dock at Hull, in connection with the Hull, Barnsley, and West Riding Junction Railway, of which Mr. Jas. Abernethy, F.R.S., M.I.C.E., is the engineer.

A brass eagle lectern, of massive yet elegant design, has lately been presented to Christ Church, Wanstead, Essex, in memory of the late Rev. G. S. Fitzgerald, which, we understand, was made by Jones and Willis, of London and Birmingham, who also have in hand a marble font for same church.

Temple · Church ·

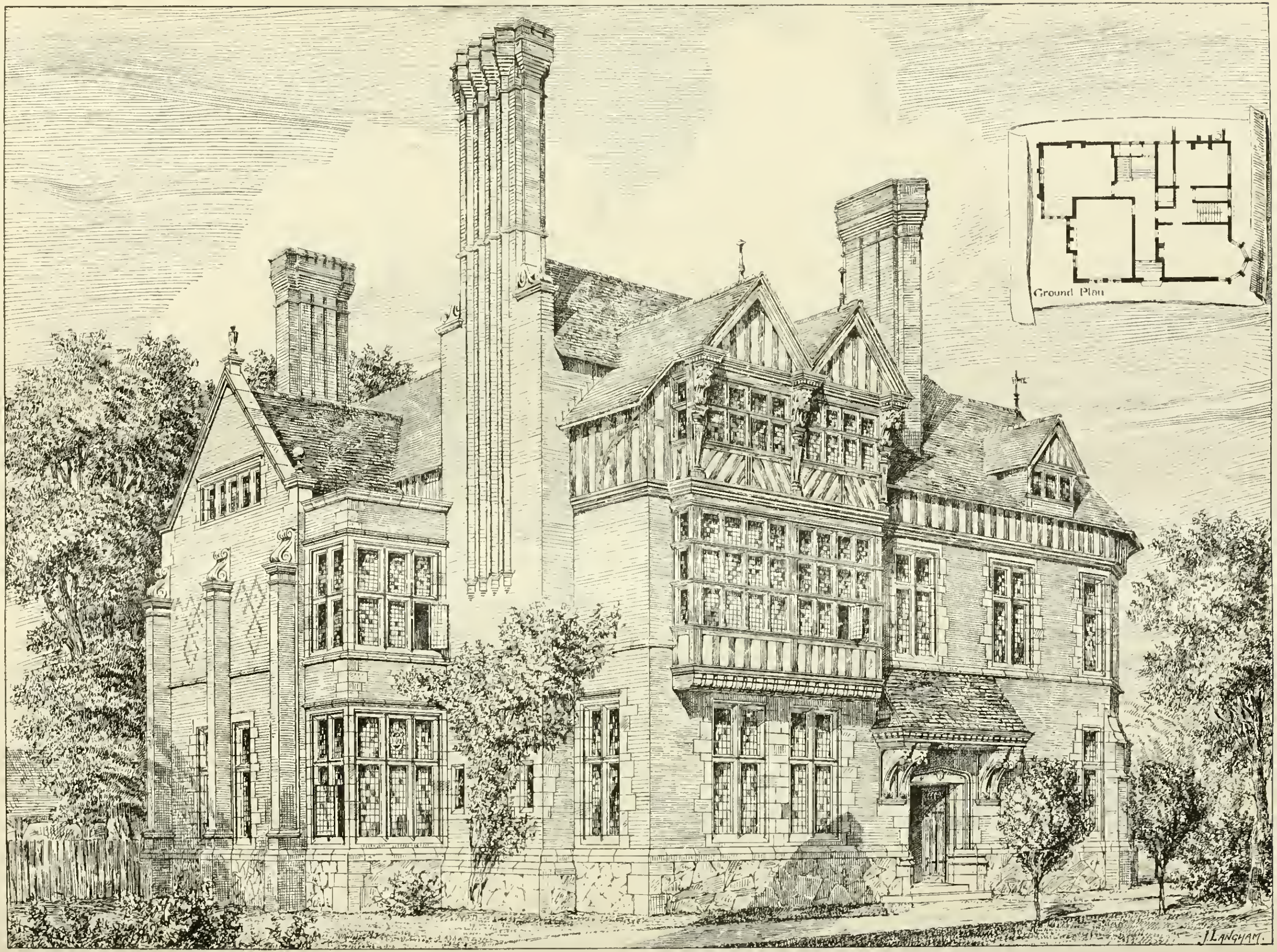


Longitudinal · Section:

Looking · North:

GEO. E. S LANGFORD, ARCHT. MENS & DEL.

Photo Lithograph d & Printed by James Akerman, 6, Queen Square, W C



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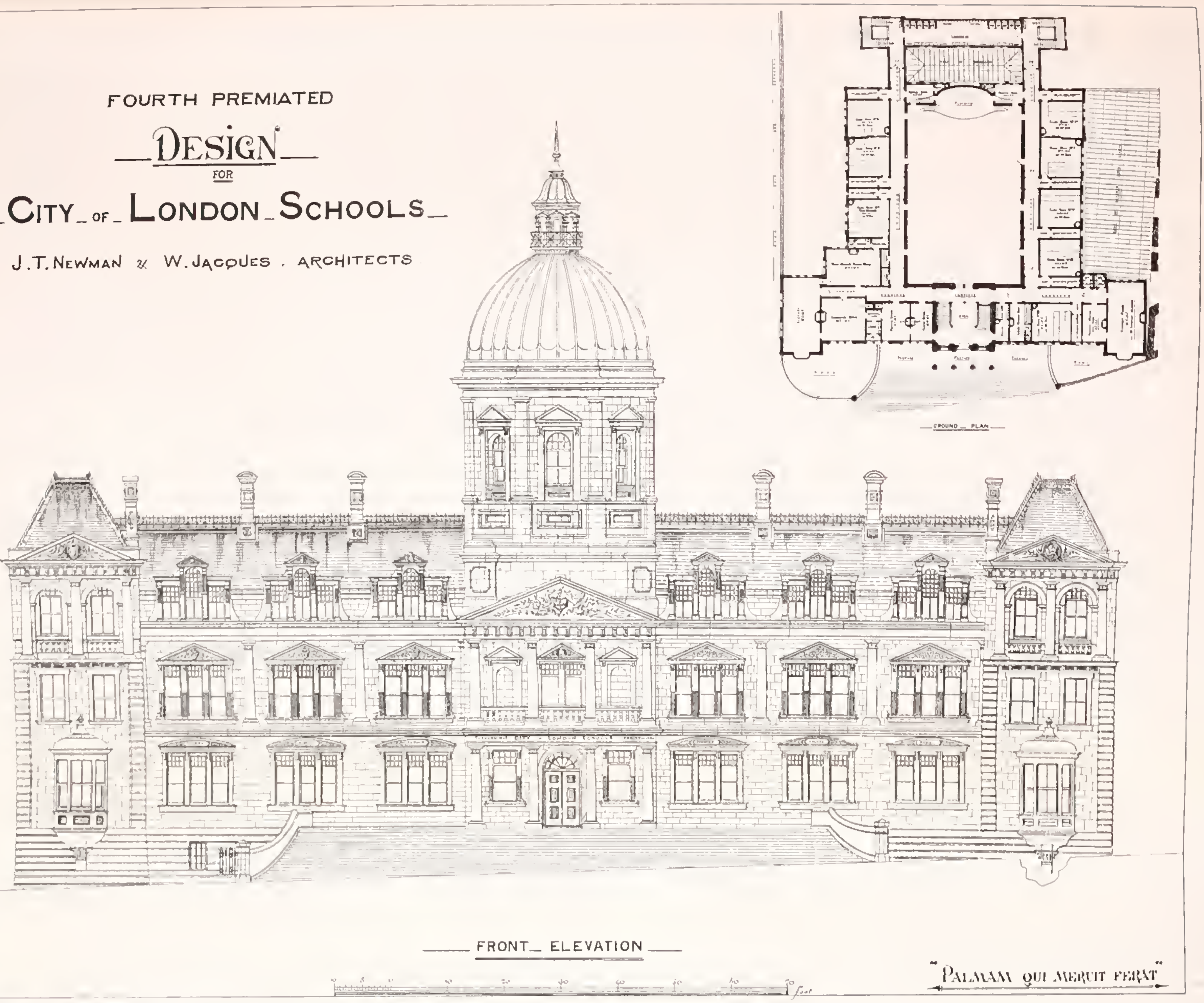
FOURTH PREMIATED

DESIGN
FOR
CITY OF LONDON SCHOOLS

J. T. NEWMAN & W. JACQUES, ARCHITECTS



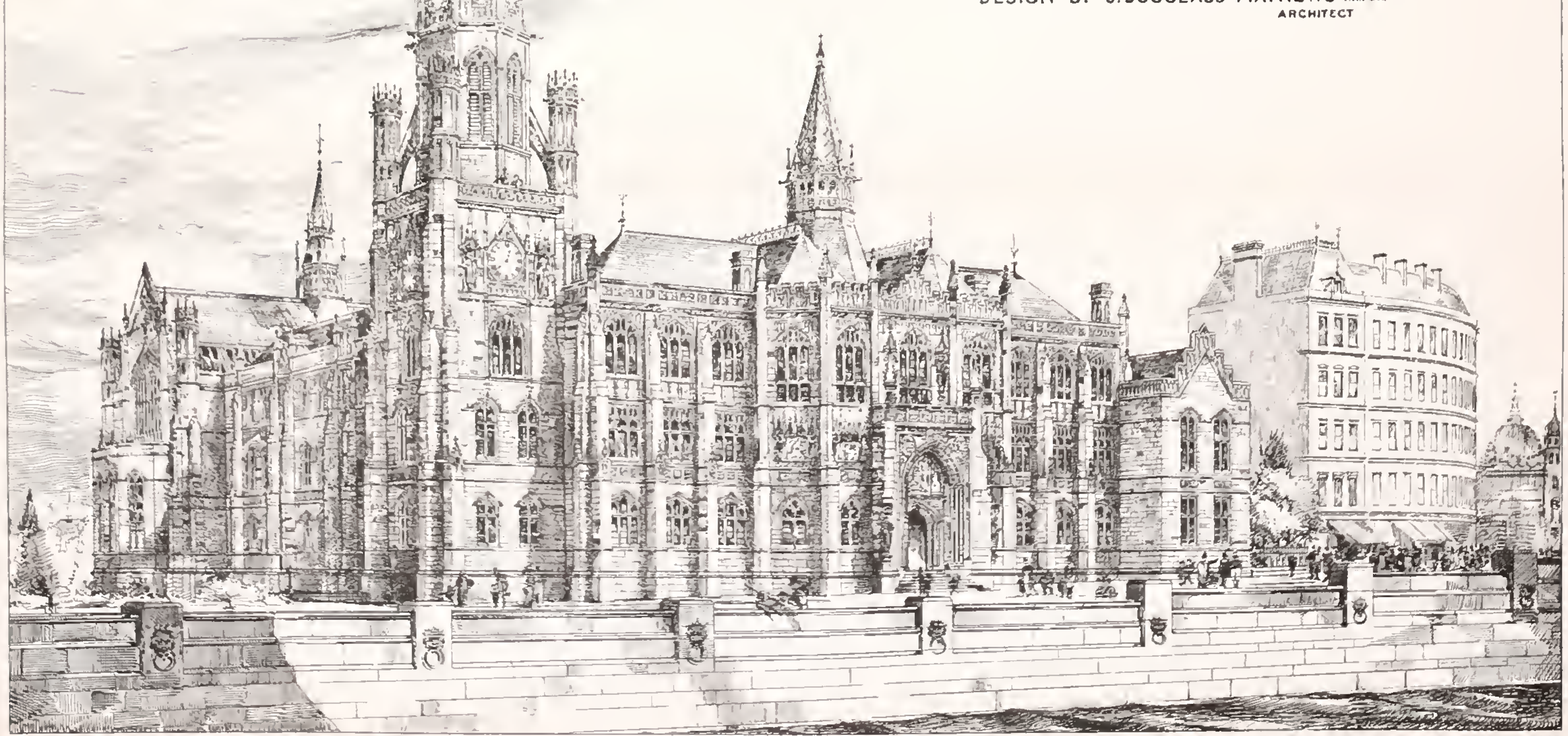
GROUND PLAN

FRONT ELEVATION

"PALMAM QUI MERUIT FERAT"

PROPOSED NEW CITY OF LONDON SCHOOL,

DESIGN BY J. DOUGLASS MATHEWS F.R.I.B.A.
ARCHITECT



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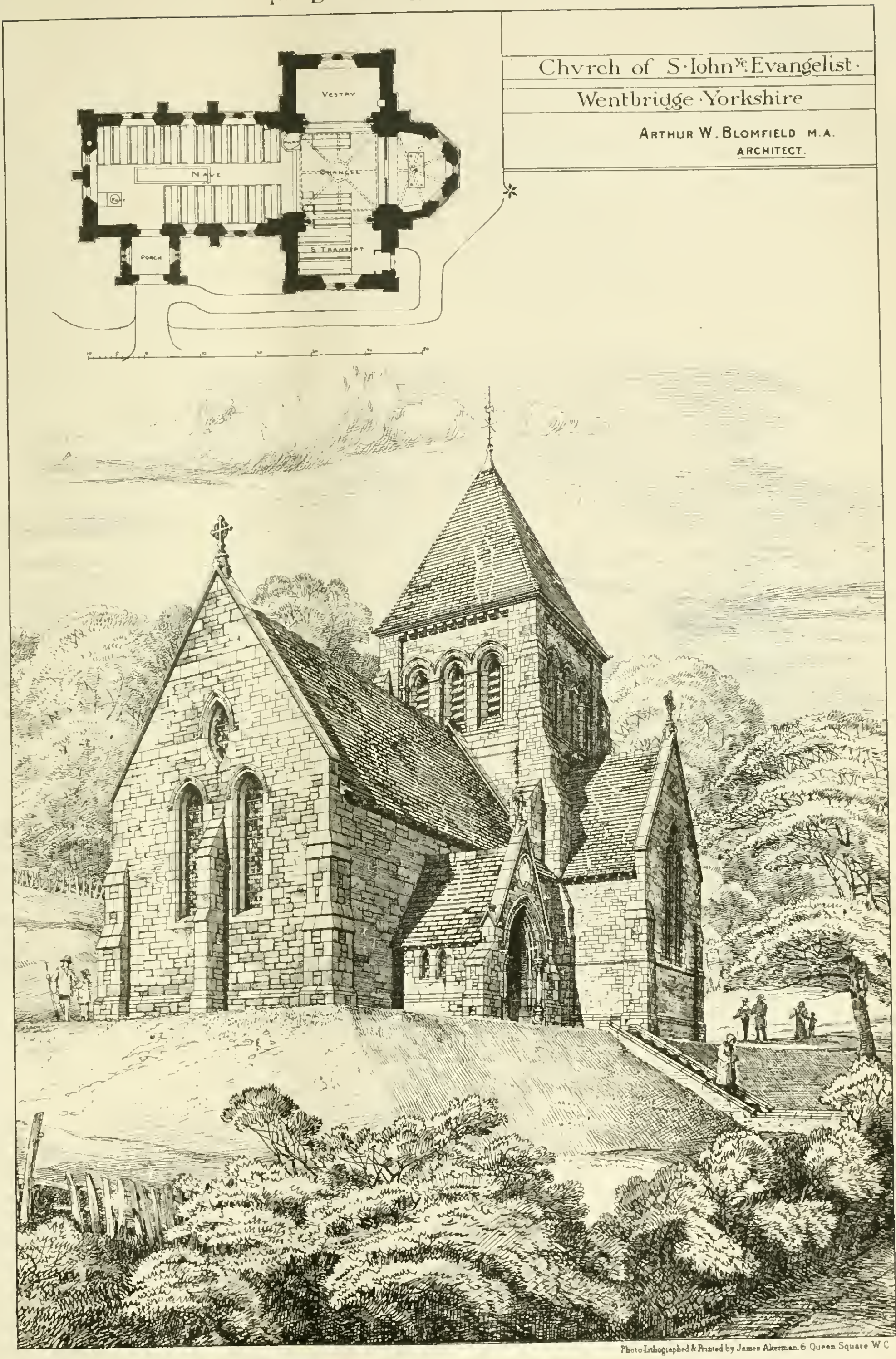

Chvrch of S·Iohn ye Evangelist·
Wentbridge·Yorkshire

Arthur W. Blomfield M.A.
Architect.

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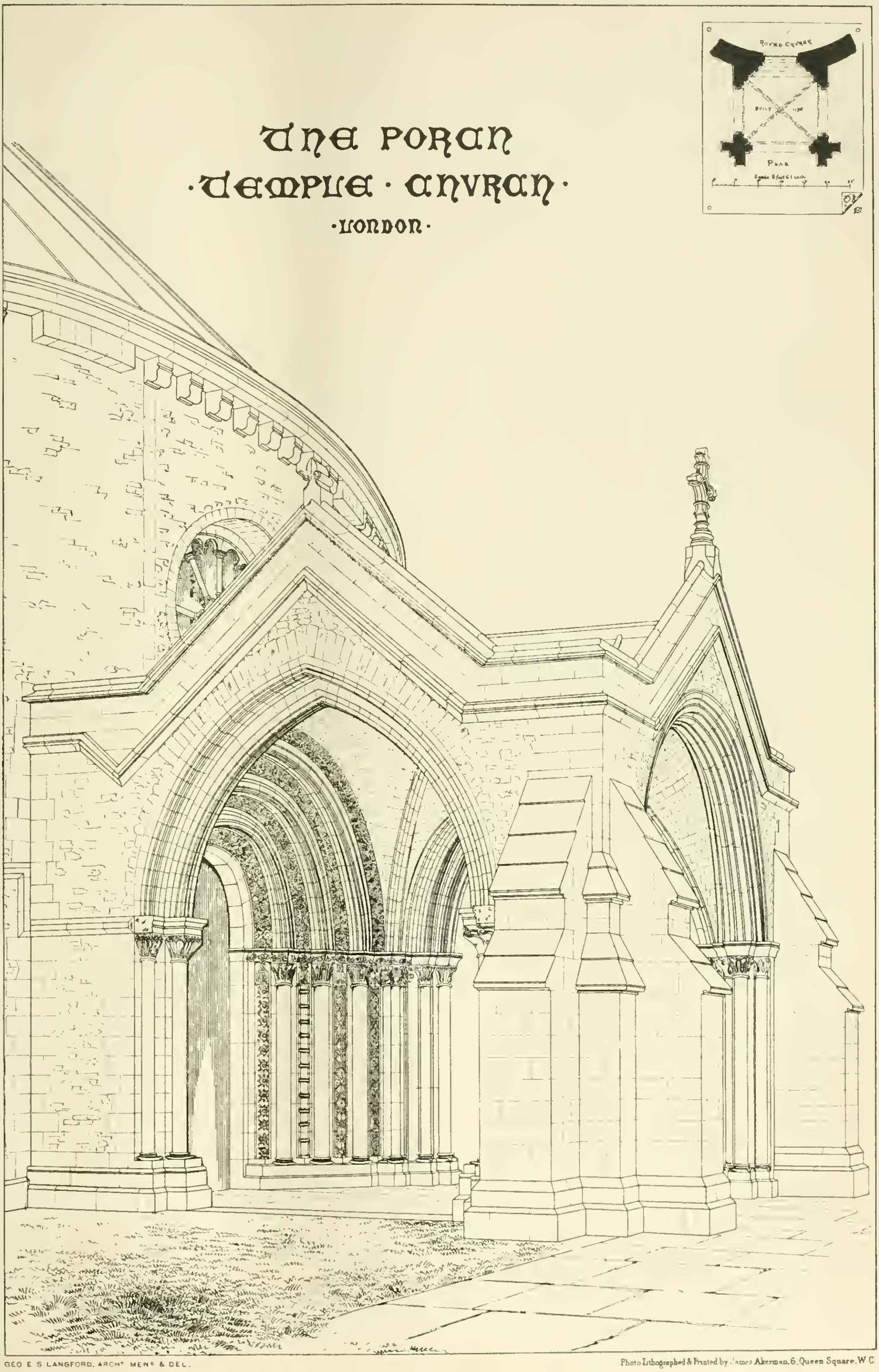
THE PORCH ·TEMPLE· CHURCH· ·LONDON·



GEO. E. S. LANGFORD, ARCHᵀ MENˢ & DEL.

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

ARTISANS' DWELLINGS SCHEMES IN THE METROPOLIS.

THE Metropolitan Board of Works has submitted the following report to the Secretary of State with reference to the sanctioned schemes under the Artisans' and Labourers' Dwellings Improvement Acts prepared by that Board: (1) *Whitechapel and Limehouse Scheme.*—The final award of the arbitrator was issued on the 20th December, 1877. The portion of the site east of the railway viaduct was cleared of buildings, with the consent of the Secretary of State, and tenders for the land were afterwards invited by advertisements on several occasions, but without result, and although the property was put up for sale by auction, no offer was made. On the 26th May, 1879, a letter was received from the Peabody Trustees, offering to purchase the vacant land for the sum of £10,000. This price was eventually accepted by the Board, subject to the terms of a draught contract to be agreed upon, and the draught agreement for carrying it into effect has been forwarded to the Home Office, and is now under the consideration of Mr. Cross. In the last Session of Parliament the Whitechapel and Limehouse Improvement Scheme Modification Act was passed, enabling the Board to carry out an arrangement for an improved approach to the area, and the examination of titles, and completion of the necessary conveyances relating to the area west of the railway viaduct are now proceeding as rapidly as circumstances will permit. The peculiar difficulties which impeded the execution of this, the first scheme sanctioned for the metropolis, were brought under the notice of the Secretary of State in a letter dated 17th January, 1879. (2) *Bedfordbury Scheme.*—The final award of the arbitrator was issued on the 4th December, 1878, and on the 15th July, 1879, the Secretary of State signified his consent to the demolition of the buildings on the southern portion of the area lying between Chandos-street and Anthony's-cottages. The necessary thirteen weeks' notices were thereupon served upon the occupiers, and this portion of the site will shortly be cleared of buildings. The Board has hitherto been precluded from dealing with the remainder of the site by a legal difficulty which has been raised by Messrs. Goupil with reference to ancient lights, and application will shortly be made to the Secretary of State for a modification of the scheme in order to overcome the difficulty that has thus arisen. The Peabody Trustees have offered to buy the land for £7,900, a price which the Board has assented to, subject to the terms of a contract to be agreed upon, and the draught agreement, which has been forwarded to the Home Office as abovementioned, comprises the whole of this area. (3) *Great Wild-street Scheme*; (4) *Old Pye-street Scheme*; (5) *Peartree-court Scheme*; (6) *Whitecross-street Scheme.*—In each of these cases the final award of the arbitrator has been issued, and the examination of titles is proceeding. The Peabody Trustees have offered to take the land at prices based, as in the case of the two first-mentioned schemes, on a rental of 3d. per foot super., to be computed at twenty years' purchase, and these terms have been accepted by the Board, subject to the provisions of a contract which is now under the consideration of Mr. Cross. The acquisition of the lands required for these four schemes is being pushed on as rapidly as possible, and with the first three much progress has been made, and the Board hopes to be in a position before very long to give the thirteen weeks' notice to the occupiers, and to apply to Mr. Cross for his sanction to the demolition of the houses. (7) *High-street, Islington, Scheme.*—The final award of the arbitrator was issued on the 26th August, 1879, and the examination of titles and the preparation of the necessary conveyances are proceeding. (8) *St.-George-the-Martyr Scheme*, and (9) *Goulston-street, &c., Scheme.*—In these two cases Mr. Hunter Rodwell, Q.C., M.P., has been appointed to act as arbitrator, and the claims of owners and occupiers which have not been settled by negotiations have been forwarded to him, and will be dealt with in due course. (10) *Essex-road, Islington, Scheme*, and (11) *Bowman's-buildings Scheme.*—Negotiations with claimants in respect of these schemes are proceeding, and due regard will be paid to the provisions of the Act of last Session with respect to the basis of compensation. (12) *Little Coram-street Scheme*, and (13) *Great Peter-street Scheme.*—These schemes are being carried into execution with the co-operation of the Peabody Trustees, and, in the case of the first-mentioned scheme, of the Duke of Bedford also; and the claims of owners and lessees which are now being received are transmitted to the Trustees, who will negotiate with the claimants and report the result for the approval of the Board. (14) *Wells-street, Poplar, Scheme.*—The execution of this scheme, which was passed in the Session of 1879, has been postponed until the Board shall have gained further experience in dealing with claimants under the provisions of the Artisans' and Labourers' Dwellings Improvement Act, 1879.—The Board, having regard to the very large amount of work now in progress in connection with the Street Improvements and Artisans' Dwellings Acts, does not propose to deposit any further schemes with a view to legislation in the ensuing Session.

ST. MARK'S, VENICE.

THE memorialists of the S.P.A.B. have certainly succeeded in arousing the attention of the Italian press and people, and nearly as much nonsense is being talked and written by the Italians as already has found utterance here on the other side. The action of the R.I.B.A. in the matter, which will be found reported in another column, seems to us to have been well-advised and dignified, and has accordingly met with a suitable response from the Italian ambassador. It is a pity Mr. Morris and his friends could not have waited, and left those to speak who had the best chance of being heard, and who, as practical architects, were most likely to have a knowledge and appreciation of the difficulties attending the question. Mr. Whichcord's remarks on Monday night must commend themselves to all except frantic enthusiasts on the one hand and reckless iconoclasts on the other, and the position we have all along taken with regard to the "anti-restorationists" was very well set forth by him when he said, "that to attempt to maintain that every useful building was to be left untouched if only it be old, and that every useless obstruction was to remain an obstruction if only it be beautiful, was a paradox opposed to the very principles upon which their forefathers constructed the self-same buildings that now delighted the many and rendered a few enthusiastic people almost inconsistent."

We seem to be in possession of a few more facts with regard to St. Mark's itself than we were this time last week. Mr. Andrew Pringle, writing to the *Times* from Venice, says:—

> "The southern end of the façade, being new, is as secure as any building in Venice can be, but the columns immediately adjoining this new part are completely bulged outwards, and without wooden supports placed against some of them would certainly fall down, if not immediately, at least very soon. At this part and all round the south door the marble has left the brickwork frame, and is simply in a state of utter ruin. The second door from the south is not quite in such a bad state as that just described, though here also the marble has left the brick, and is only kept in place by large wooden beams. Between the second door and the large centre one the marble is almost all broken, and a hole about 2ft. wide allows the bricks behind to be seen, and the bricks themselves seem to be in anything but a satisfactory condition. At this part also the upper row of columns have left their original vertical position, and are now leaning some one way, some another. The door next the centre one towards the north seems to be in the best condition of all, but the last door (northern) is almost as bad as the first. The pillars sustaining the portico at this end seem to be borne right out of their proper position by the weight and the direction of the pressure of all that part of the edifice. The iron bands and supports placed here will, I fear, have little effect in preserving long these columns from downfall. Within the last six weeks workmen have been repeatedly employed in replacing and securing *pro tempore* various slabs of marble, which have been falling out of their places on the façade. These are the observations of one entirely ignorant of the science of architecture, but of one who wishes to place before your public both sides of the question and the facts of the case as they strike the unbiased observer. That something must be done, and that promptly, to the whole of the *facciata* I am confident; let us hope, and try to bring about, that in the work of restoration the least possible damage may be done to the works of art which give such value to the cathedral of St. Mark."

A correspondent of the *Birmingham Daily Post* writes:—

> "I was surprised myself at the statement made that the structure of the noble fabric was in course of undergoing such ruthless 'renovation,' as it is not very long since I inspected the work in progress, and I saw no sign of any tampering with the venerable features of the pile. I was much pleased, on the contrary, with the effect of the general restoration of the north-west angle, the beautiful marble pillars of which have been cleaned and repolished, and promised myself a treat when I should be able to see it continued, as appeared to be the intention, along the whole of the front, and so view the splendid façade in all the pristine glory in which it appeared to the Venetians some centuries ago. Some of our antiquarians, however, object to this work as altering the antique aspect of the building. I can understand an objection to scraping away the tone of old red brick or plain stone, but the removal of the encrustations on the walls of St. Mark's is as judicious and desirable a renovation as that adopted many years ago with regard to the pillars in Ely Cathedral, and which led to similar improvements in other ancient national edifices of the kind. On the question of taste, therefore, I think the Italians have the best of it."

In the Venetian *Rinnovamento*, of the 22nd ult., Signor Meduna, the architect who restored the south façade, confirms Mr. Street's opinion as to the non-necessity of any substantial repair to the west front. He says:—

> "That which was an absolute necessity for the south front is not equally so for that facing the west, in the case of which some partial reconstructions, and those perhaps of no great importance, are sufficient, but indispensable. As regards the south façade—which has been entirely demolished and reconstructed, and with it at the same time various portions of the internal walls, of the arches, and the vaults—if in the year in which the work was undertaken the means used for guaranteeing the fabric had been deferred for even a short time, the south front, with the neighbouring portions of the interior, and indeed a considerable part of the church, would have been seen to fall. The promptitude then employed, and the sufficiency of the means used for safe guarding the building, warded off the threatened danger, caused by walls, in great part constructed of fragments of bricks in their interior, too thin to offer due resistance to the thrust of the vaults and arches and architectonic decoration, and with insufficient foundations."

Signor Meduna goes on to reply to the complaints which have been made respecting the restoration of the pavement of the church, in a spirit which illustrates in a remarkable manner the differences existing between him and his impugners, and the hopelessness of their understanding each other. He insists that, "in the reconstruction of the pavement the design is the exact reproduction of the old one, the quality of the marble identical, but the work is executed with an exactness and stability wanting to the old work." The correspondent of the *Standard* thinks it is a pity that Mr. Street should have put forward his theory of the undulations in the pavement of the church having been intentionally produced. Perhaps, indeed, the Italian papers may have misrepresented his remarks on the subject. But the maintenance of such a theory would be felt in Italy to put the supporter of it entirely out of court. It is absolutely untenable. What, asks the *Standard* correspondent, does Mr. Street—if such really be his theory—say to the large slabs which have been irregularly broken by the subsidence of the soil, which has caused the undulations? As for the piers and columns of the church, they have not been similarly affected, because a security of foundation was provided for them, which was not deemed necessary for the pavement.

Our old friend "Elijer Goff" (Mr. William Dawes), has been improving the occasion after his usual fashion in the *Manchester City News*. Meeting a literary friend in Manchester on a very crooked bit of pavement:—

> "He asked him how he akkounted fur the centrifugal motion of the pavin' stones. He said he had bin strick with a noshun that it was intended for the sea like St. Marks only in a whirlpool part. The Lokal Board were bitin ever with poetry, he sed, and had tipplekal ideas. Sum of 'em hed read of the Adriatik and the rest hed boated on the Irwell, and it okkured tu 'em that they'd like the pavin stuns tu ripple a bit. Unfortunately the man as hed tu do it hedn't seen the Adriatik pattern and didn't kno the Irwell when he did see it, but he had kum over from Americky in a rollin ship, so he jes laid that pavement out in Atlantik rolls with a bad foundation, and thur it was to this day. Nothin kud surpass it from a poetikal up and down pint of vu. I told him as the tilin in our front passage wos a bit wavey, but as summot hed guv way under it there wos no poetry about it. "Ah," he sed, "it aint so with St. Marks." I asked him who he wos. He sed he wos a Amatoor Arkeologist of long standing and he felt tired. I inquired if he thote the parst ought tu be restored. He sed he wuddent tutch it so long as it kud hang tugether. We air the kustodians of the parst, he sed. Weve no workmen good enuff tu replace it nor klever enuff tu repare it, and as fur kolour—luk at St. Marks front which they wanted to do sumthin tu, tu give futur ages a chance of lukking at it. Restore it! Bah! John Ruskin's the man fur my money. He sez, 'Dont alter a stun. Keep on drawin till it falls.' He's right. 'How wud yu like to hav yure front restored if yu wur St. Marks?' he suddently demanded turnin tu me abrupt on his axis. I asked him if he thote it wud tend tu impruv the Lukes. Whurupon he breathed a long teknikle kuss as is unfit fur publikashun except in a arkeologikle paper. Then he wos silent. As he sot thur he lukked like a dumb argyment in favor of restorashun, but all at onst he aroused hisself intu renewed inkonsistensy and exklamed in tragik tones 'Let the marble fade and the stun krumble intu dust. Better lose all than renew. The restorer is as bad as the destroyer. We'll none on't. "Oh Italia, Thou who hast the fatal gift of beauty," Let thy loveliness disintegrate intu unrekognizabul and unrestorabul ruin rather than let the modern masons attempt tu renew thy form and perpetuate thy beauty. Let—' I hate sittin by a fool, so I got up and went home"

The new Ramsden Docks at Barrow-in-Furness were opened for traffic on Monday.

CHURCHES DESTROYED BY FIRE.

THE destruction of churches by fire having of late occupied a great deal of attention, and this, too, being the season wherein such events very frequently occur, Mr. Cornelius Walford has thought that it may be of interest to readers to be furnished with a list of the burning of churches in this country, so far as he has been able, with some research, to make an enumeration of the same. He is well aware that the list, which he publishes in the *Guardian*, is by no means complete; but he is very desirous of making it so; and he will be thankful to all who will supply omissions; and to be referred to any tracts, works, or county histories giving details of such burnings.

Churches Destroyed by Fire in the United Kingdom.

Date.	Place.	Cause.
1736, Aug. 26	Bouenham, Norfolk	?
1758	Wolverhampton new Church	?
1762	Sittingbourne parish church	Workmen.
1795	London, St. Paul's, Covent-garden	?
1803	Boston, Lincolnshire, damaged	?
,,	Westminster Abbey, great tower over choir	?
1817, June 28	Bermondsey	?
1829, Feb. 2	York Minster, choir and Chapel of Our Lady	Madman.
1830, Dec.	Lewisham parish-church	Flues.
1831, Jan. 6	Blackburn parish-church	Flues.
,, ,, 16	Warkworth (Northumberland), partial	Flues.
,, ,, 24	Birmingham, St. Peter's	?
1832, Dec. 30	Boughton Monchessea (Kent)	?
1836, Feb. 17	Spitalfields (London), tower burned	?
,, Dec. 30	Pimlico, St. Peter's	?
1840, May	York Minster, much injured	?
1841, Jan. 3	Dundee, three churches, viz., South Church, Cathedral, and Cross Church	Accident.
1841, Nov. 5	Bawdsey (Suffolk)	Fireworks.
,,	Camberwell parish church	?
1845	Edinburgh, Grey Friars	?
1849, Nov. 11	Cambridge, ancient Church of St. Michael	?
1850, Mar. 29	Limehouse, St. Ann's Church	?
,, Nov. 15	Cockermouth, All Saints'	?
1853, Feb. 7	Doncaster parish church	?
1857, Oct. 27	Hawardine (Flintshire)	?
1860, Jan. 8	Dublin, St. Andrew's (round) Church	?
,, Nov. 29	Kilburn, Maida-hill Church	?
1862 Nov. 23	London, Dutch Church, Austinfriars	?
1864	Ditto, Royal Savoy Chapel, Strand	?
,,	Durham, Church of Shirburn Hospital	?
1867, Jan. 5	Croydon parish church	?
,, Mar. 24	London, St. Andrew's Notting-Hill	?
,,	Clifton, St. Paul's	?
1869, Ap. 17	Walworth, All Saints'	?
1872	Canterbury Cathedral, roof injured	Workmen.
1874, Oct.	Aberdeen, East Church	?
1877, Nov.	Lamerton, near Tavistock	Lamp.
1879	Bristol, Church of St. George	Gas stove.
,, Oct.	Wells-next-the-Sea p. church	Lightning.
,, Nov. 18	Edinburgh, St. Leonard's	Overheating.

THE FALL OF HOUSES IN TOTTENHAM COURT ROAD.

SINCE our remarks upon the above subject the coroner's inquiry has been resumed, but as there are other witnesses to be called, including one of the workmen, who was still an inmate of the hospital, the coroner adjourned the inquiry till next Friday. The additional evidence brought forward on the last occasion appears to establish the facts we have already published. Three important witnesses—F. Blandford, a carpenter and joiner; Thomas Carey, a bricklayer's labourer; and Richard Taylor, a carpenter, all employed upon the alterations—concur in the opinion that the houses were not safe, and that the premises were in too rotten a state to be touched. It appears from the examination of these witnesses that the uprights and needling to the front and back walls were insufficient; but two other important facts were elicited from them, namely, that the floors were first raised and then lowered, and that the centre front girder after being put in had shifted, causing a disturbance of the front wall. Mr. Wallen, the district surveyor, is of opinion that the middle pier failed, and that the front walls of 171 and 172 then fell, and dragged with them the first floors of both houses, causing the light iron girder that carried the floor of 171 to snap in two. Mr. Wallen appears to have come to this conclusion from the appearance of the middle and back girders, which are clearly dragged forward. The joists, as they appeared to us on our visit, certainly indicate a movement forward, as the joists are drawn out of their bearings at the back, and have fallen in. We hinted last week that any underpinning or disturbance of the front piers would have to be considered in determining the immediate cause of danger; and Mr. Wallen's evidence now goes to show that the pier between 171 and 172 had been "underpinned with Portland cement imperfectly." It appears also that no story-posts or front shores were used in the operation. Mr. Robt. Walker, district surveyor of St. Martin's and St. Anne's, who had condemned between 700 and 800 buildings on his own showing during the last two years, and had examined the débris, gave it as his opinion that the front walls had not been bonded: he also concurred with Mr. Wallen that the underpinning was imperfect, and that the vibration caused by the traffic was the immediate cause of the fall. Previous alterations made some years ago had weakened the pier, and rendered it insufficient to sustain the weight, which he estimated at about 23 tons, or a crushing weight of some 30 tons. One point of moment to district surveyors was referred to in Mr. Wallen's evidence, namely, that the notice he received from the contractor was inadequate, and by no means expressed all the work undertaken, or, indeed, that portion of it which led to the catastrophe.

SEWAGE DISPOSAL.

AT a meeting of the Society of Engineers, held on Monday evening, a paper was read by Mr. Henry Robinson, C.E., on "Sewage Disposal." The author, in the first place, described the different systems which are employed for the removal of the refuse of the community, and the advantages and disadvantages of each. He then called attention to the large number of deaths recorded annually in the Registrar-General's Returns, arising from preventible diseases, due to bad house sanitation and defective sewerage, and he referred in detail to the chief causes and to the remedies for these evils. He condemned the apathy shown by the vestries in the metropolis and sanitary authorities generally to the provisions of the several Sanitary Acts, and pointed out that the duties which had been imposed by the Legislature on these authorities were practically disregarded. The pollution of water by its storage in uncleansed cisterns was referred to, and an opinion expressed that the water as supplied to the metropolis was not the cause of illness, but its pollution after delivery; and that far more blame attached to the householders for not examining their cisterns than to the water companies. The author advocated the expeditious completion of the constant service which was now being gradually accomplished. The operation of the Rivers Pollution Prevention Act was then considered, and the necessity for its amendment shown, owing to the difficulty experienced in arriving at an agreement as to what was a reasonable system to enforce in the varying circumstances of towns, in respect to the purification of sewage. The exemption of the river Thames and the metropolitan sewage was referred to, and this question was considered at some length, the author expressing an opinion that the sewage of the metropolis should be purified before its discharge at the outfalls; and, from calculations he had made, he considered chemical treatment would be the cheapest, and could be accomplished for 7d. a head. He pointed out that the arbitration between the conservators of the river Thames and the Metropolitan Board of Works was really dealing with the commercial part of the question (namely, as to interference with the navigation), leaving the sanitary part for future consideration, as apparently of secondary importance. The author then at considerable length entered into the laws which governed the disposal of sewage upon land, and gave the average results of 22 towns he had investigated, which were as follows:—39·3 gallons of sewage per head of the population per day. The sewage of 114 people to the acre of sewage farm. Cost of sewage farm 1s. 10d. per head of population, and 6½d. in the pound of rateable value. Where land could not be obtained as a purifier and utiliser of sewage, he indicated methods of dealing with it by chemical treatment. In conclusion, the author abstained from recommending any system, stating that his experience had led him to advise the adoption of a system for a town according to its own special circumstances, and considered that those who advised in these matters, whilst being free from bias in favour of any system, should be practically familiar with them all.

THE CHURCHES OF YORKSHIRE.*

WE have before us the first number of a new serial publication, entitled the "Churches of Yorkshire," which we briefly referred to recently. The names of W. H. Hatton, F R.H.S., and W. E. Fox, members of the Yorkshire Archæological Society, which appear on the title-page, indicate that reliable sources of information will be placed under contribution. The work will be illustrated, and will contain full descriptions of the churches, together with historical facts, extracts from the registers, and other information of a local character. In the introduction, the authors say: "The work is intended to place within the reach of every Englishman who loves his country and its Church a concise description of every Yorkshire church, along with the historical references, and archæological notes connected therewith." The churches described in the present number contain St. Michael's, Haworth; the White Chapel, Cleckheaton; All Saints' Chapel, and St. Laurence Church, Pudsey; Ilkley Parish-church, and wood engravings accompany the text. Glancing at the architectural descriptions, we find the features of each church are distinguished with tolerable accuracy, and the styles of the several portions carefully noted; but the omission of using capital letters to the names of the styles is a fault that might be rectified with advantage in future numbers. A great deal of curious archæological learning and facts are condensed in the descriptions, that will be read with interest by antiquaries and admirers of church-architecture. Glancing at the account given of Ilkley Church, we find it stated that the "tower is really the only portion of the original church now remaining, and the additions which have been made to the sacred edifice from time to time have certainly not added to the beauty of the exterior view." The "splay footings"—the term should have been splayed sills—of the clerestory windows are flush with the roof of south aisle, and have a poor effect. Speaking of the fine doorway of Norman character, it is said there are few specimens of Norman carving, excepting those of Adel, East Ardsley, and Kirkstall, to equal it in this part of Yorkshire. The inscriptions on the windows are interesting. All Saints' Chapel, Pudsey, is, or, rather was, a queer little edifice in pseudo-Classic style of one span with a small tower and cupola open below rising out of the roof at the west end. The engraving is faulty in drawing, and does scant justice to the building. The authors inform their readers that it has lately been pulled down by the direction of the local board, in order to effect a street improvement. In style, to judge from the engraving, there is little to commend: the windows were round-arched, and had architraves with keystones, and the cupola was in the thorough Classic spirit of the last century. St. Lawrence Church, Pudsey, has not much higher claim to notice, architecturally. It was built in 1831, in the Perpendicular style of that date, with flying buttresses, heavy battlements, and mullioned windows. We could certainly have wished the authors had given us older and better examples of church-architecture than the last two buildings. St. Michael's, Haworth (as to the demolition of which building, owing to its association with the Brontë family, who once worshipped and are now buried in it, plaintive wails have been raised), was more interesting; it was evidently of the age of the early Classic revival; the authors assign the period between Henry VIII. and 1775 as the date of rebuilding. Several old fragments of work remained, including the lower portion of the tower. A larger church is to be erected on the site, and the mural tablets to the Brontës and other memorials will be conspicuously placed in it. A frontispiece to the number shows the west front of York Minster. A few of the engravings look as if they had been borrowed from other sources, and hardly equal to the labour bestowed upon the literary part of the work; but, with these shortcomings, the work is unquestionably cheap—the price of each number is only 6d., and the work is well printed on good paper, and will be valued by all those readers who desire to become acquainted with the great churches of Yorkshire, and who have not the means of purchasing more costly works.

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* The Churches of Yorkshire. Illustrated. By W. H. Hatton, F.R.H.S., and W. E. Fox. Bradford: John Heywood and Sons; London: W. H. Smith and Sons.

BOOKS RECEIVED.

Messrs. Longmans, Green, and Co. have just published a sumptuous guinea edition of Moore's Oriental romance *Lalla Rookh*. The typography, as might be expected from the publishing firm, is of the best, the binding is attractive, and the poem is illustrated by sixty-nine engravings from original drawings by John Tenniel, executed on wood by the Brothers Dalziel. There are also five ornamental title-pages by T. Salman, junr., and engraved on wood by H. N. Woods. The arabesques upon these are compiled and adapted from Persian MSS. in the East India House library and the British Museum; the first of these is illuminated in gold, vermilion, green, grey, and black, and is exquisitely rendered. Another very effective design is that introductory to "Paradise and the Peri," in which architectural details of tracery and lattice-work from Baghdad are introduced. The book is published at a guinea, and is one of the most attractive gift-books of the season.——*Our Own Country* (London: Cassell, Petter and Galpin) has already earned its due praise in its serial form, but will be welcome to many more readers bound up in the handsome volume before us.——*The British Almanac and Companion for* 1880 (London: Stationers' Co.) is exactly the same as usual—dates alone altered, and the titles of the articles in the Companion—even to the stereotyped protests of that clever individual who does the "Architecture" of the year, against "the general weakness and insufficiency of the architecture of the day."——*Plumbing* (By W. P. Buchan. London: Lockwood and Co.) is the second edition, revised and enlarged, of a useful text-book which we were the first to give to the world many years back, and which has remained the only treatise which can be regarded as a really reliable manual of the plumber's art.——We have received a well-arranged and comprehensive illustrated catalogue of mouldings, architraves, sash-bars, skirtings, &c., in red deal and yellow pine, from Mr. W. Gradwell, of the Hindpool Saw Mills, Barrow-in-Furness, which will be useful to any architect or builder.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Glasgow Archæological Society.—The annual general meeting of this Society was held on Thursday, the 27th ult., in St. Andrew's Hall, Glasgow, Mr. Michael Connal, V.P., in the chair. The annual report of the Council showed that the Society was in a prosperous condition, and that the membership had considerably increased. The election of office-bearers for the ensuing year took place, the result being that Principal Caird, D.D., was appointed president; Professors Young and Veitch, and Mr. M. Connal, vice-presidents; Professor Lindsay and Mr. J. Dalrymple Duncan, 223, West George-street, hon.'secretaries; and Mr. A. Galloway, 59, Bath-street, foreign hon. secretary. Mr. J. Napier having read some extracts from the "Diary of the Rev. Robert Law, 1638-84," giving information as to the social condition of Scotland at that time, Mr. Kirsop exhibited a collection of Roman *fibulæ* and Samian ware, recently unearthed in the Mendip Hills, Somerset, as well as some Australian native carved inplements, the markings on which were said to bear a curious similarity to those on a large class of the sculptured stones of Scotland.

Society of Antiquaries.—On Thursday week a meeting of the Society of Antiquaries was held at Burlington House. It was the second evening of the season, 1879-80. With respect to the intended restoration of St. Mark's, at Venice, a letter was read which had been signed on behalf of the society and forwarded by Lord Carnarvon to Lord Salisbury, asking him to use his influence with the Italian Government to remonstrate against any needless alteration in the structure and decoration of that gem of Christian art. It was hoped that this letter would prove as successful as the remonstrances of the society a few years ago have proved in saving from secularisation the monastry of Monte Casino. An address to the Lords of the Treasury was also read asking for Government aid towards the publication of valuable historic papers from our national archives. Mr. Freshfield read to the meeting some interesting extracts from the parish books of St. Stephen's, Coleman-street; and Professor Stubbs and Mr. E. A. Bond, of the British Museum, were elected Fellows by a vote of the council on account of their eminent services to the cause of antiquarian science. A vote of thanks to the chairman brought the proceedings of the evening to a close.

COMPETITIONS.

Staines Town Hall Competition.—At the meeting of the Staines Local Board on November 26th, from about fifty designs submitted, the one bearing the motto "Hotel de Ville" was selected. The author is Mr. John Johnson, architect, 9, Queen Victoria-street, Mansion House, E.C. It was resolved that the designs be exhibited at the clerk's office for 14 days for the inspection of the competitors and the ratepayers.

SCHOOLS OF ART.

York.—The annual meeting of the subscribers and friends of the York School of Art was held on Tuesday evening. The report stated that the school had passed through a satisfactory year. The number of students had been 142, as against 135 last year. It was to be regretted, however, that there was a further falling off in the number of artisan students. In the second grade examination last year 32 candidates presented themselves, of whom 20 were successful, 7 being marked excellent, while 2 students had obtained full second grade certificates. In the third grade examination 9 prizes had been gained, of which 3 had been withheld on account of the students having previously gained prizes in the same subject.

CHIPS.

The second annual distribution of prizes and certificates to the members of the art class at Newport, Isle of Wight, took place on Monday week. The report showed that the attendance had increased from thirty-eight the first year, to fifty students, and that five Queen's prizes had been gained at the examination, and seventeen department and twenty-four local certificates had been awarded for third and second-grade work.

The Secretary of the Stonemasons' Society of Victoria has written a letter of warning to artisans not to emigrate to that colony from England.

A new cattle saleman's auction mart, with pens adjoining, was opened at Forfar on Monday. The architect is Mr. W. G. Lamond, of Arbroath.

A massive silver altar-lamp was hung and lighted for the first time in the recently renovated Catholic Church of St. Nicholas, Francis-street, Dublin, on Sunday week. It was designed and executed at Messrs. Smyth and Sons' manufactory, Dublin.

The foundation-stone of a schoolroom about to be added to Appley House, now known as the Isle of Wight College, at Ryde, was recently laid by the Bishop of Winchester. The room will be 60ft. by 30ft., and 20ft. in height, and there will also be additional offices and heating apparatus laid down. The contract has been taken at £1,200 by Mr. Isaac Barton,'and the architect is Mr. Francis Newman, who has also been instructed to prepare means for converting the stable yard into racket and fives courts and a gymnasium.

Miss Effie Gray Millais, eldest daughter of Mr. John Everett Millais, R.A., was married on Friday to the only son of Lord Justice James.

The London Streets Tramway Company have commenced the formation of their extension line from Kentish Town-road, along Prince of Wales'-road, Malden-road, and Southampton-road, a section which will connect the Euston-road and King's Cross with Haverstock Hill and Oak Village, and nearly reach Hampstead.

A new line of railway, commencing at Oldham Junction and connecting South Yorkshire with the Sheffield and Wombwell systems, was opened on Monday for passenger traffic.

Mr. James Abernethy, C.E., of Westminster, visited Whitby, on Friday, in order to examine into, and report upon, Mr. R. Ward Jackson's plans for the improvement of the harbour.

Last week the new general post-office erected at West Bromwich, near the Staffordshire Joint-Stock Bank, at a cost of nearly £2,000, was opened without ceremony. The architect was Mr. E. Pincher, of West Bromwich, and the builders Messrs. Trow and Sons, of Wednesbury. The building is of red brick with stone facings.

A new church at Milland, near Liphook, Sussex, was consecrated on Saturday-week by the Bishop of Chichester. Mr. W. Street was the architect, Messrs. Pink the builders, and Mr. Jackson the Clerk of Works.

Building Intelligence.

Forden Church, Montgomeryshire.—In this church has just been put up a new reredos; the centre portion, having a richly-carved floriated cross with a deeply-cut diaper at the back-ground, surmounted by a cusped and gabled canopy, and supported on marble columns and capitals terminating at the top by a carved finial and at the bottom by adoring angels. The sides of reredos are relieved by quatrefoil panels, containing boldly-sculptured heads, life size, of the four Evangelists, finishing with an ornamental projecting cornice. The work has been carried out, together with the carvings of the church, by Mr. R. Boulton, of Cheltenham, from the designs of the architect of the church, Mr. J. Nicholson, F.R.I.B.A., of Hereford.

Hope-under-Dinmore.—The parish-church of Hope-under-Dinmore was recently reopened, after restoration at a cost of £1,150. It was originally proposed to entirely rebuild the nave and chancel; but the latter has been postponed for want of sufficient funds. A gallery, which was approached from out of the tower, has been entirely removed, and new walls have been built from the bottom of the foundations. The tower has been opened out into the church, and forms a baptistry. A new chancel arch has been erected. A new transept arch has also been built. The old roof has been entirely removed, and a new massive oak open roof substituted. The whole of the roofs have been covered with stone tiles, the former sound tiles of the old roof having been reused. The material for the dressed mason work has been supplied from the Luston stone quarries. The roofs are coped with cut stone ridge cresting from Grinshill quarries. The work has been designed by Mr. F. R. Kempson, architect, of Hereford. and has been carried out by Mr. Henry Welsh, of Hereford. The carving was done by Mr. R. Clarke, of Hereford.

Hull.—The new offices of the British Gas Light Company (Limited), in Baker-street, are just about being completed. The style is Jacobean. The principal front up to the window-sills is built entirely of Spinkwell stone, having massive base moulding and sub-plinth, the upper portion of the front being faced with red pressed bricks and stone dressings. It is divided into three bays, the doorway being at one end, projecting slightly with double red Aberdeen granite pilasters and finished with circular pediment and carved tympanum. The end bays are carried up above the parapet with dormer windows, encircled by mouldings of contrary flexure crowned by a ball finial. The windows have segment heads on the ground-floor, the upper ones being square, with festoons of fruit and flowers carved in stone beneath the sills. The end window-sills are semicircular on plan, corbelled out with a wrought-iron balcony railing around them. The roofs are covered with plain red tiles. The general or public office is 37ft. by 33ft. 6in. and 18ft. high, and there are chief clerk's and engineer's offices, lavatories, and strong room on the ground-floor, the upper floors being arranged as a residence for the chief clerk. A large yard and workshop are situate in the rear of the building. Cement has been used for the finishing of the principal office, the ceiling of which is considered a fine example of the plasterer's handicraft. The fittings are of polished pitch-pine from the architect's designs. The heating is by Gibbs, of Liverpool, and the general contractors were Messrs. Clarkson and Son, of Queen-street, Hull. The cost, including fittings, will be about £5,000. Mr. Robert Clamp, A.R.I.B.A., is the architect who has designed and superintended the entire works.

Lifford.—The foundation-stone of the "Prior Endowed Schools" was laid on the 24th ult. The building is at Lifford, Co. Donegal, Ireland, and consists of boys' and girls' schoolrooms, each 30ft. by 20ft., mixed schoolroom 40ft. by 20ft. (with movable partition), and four classrooms. There are also hat and cloak rooms, lavatories, latrines, &c. It is intended to accommodate 200 children. The stone is a good blue limestone from a local quarry, with Dungannon freestone dressings. All walls will be battened. Bangor slates will be used for roofs, and red wood generally throughout. The contract was taken by Mr. James McClay, of Strabane, at £2,198 10s., Mr. John Kennedy, M.R.I.A.I., of Londonderry, being the architect.

New Zealand.—A new Hall of Justice is about to be esected at Invercargill, N. Z. The style is Classic. The front façade is designed with a portico in centre, consisting of four columns, each 33 feet high, supporting an entablature enriched by triglyph ornamentation in frieze, the whole surmounted with a pediment. A new Girl's High School is also being erected in the same town and in a similar style. A new District School is being built at a cost of £1,080, at Riverton, some five-and-twenty miles from Invercargill. All the foregoing are being erected from the designs of Mr. F. W. Burwell, architect, Invercargill.

North Ormesby.—On Wednesday last, the 26th November, the memorial-stone of the extension of the Church of the Holy Trinity, North Ormesby, Middlesborough-on-Tees, was laid by Mrs. Pennyman, of Ormesby Hall. The present church consists of nave, choir, chancel, north aisles, vestries, and north porch. The additions are, south nave and chancel aisles, extension of nave westwards, with additions to north aisle, tower and spire at south-west corner of nave, the lower part of which forms a west entrance and corner. The cost of the additions will be about £1,800. The architects for the additions are Messrs. Armfield and Bottomley, of Middlesborough-on-Tees and Whitby, and the contractors Messrs. Allison Bros, of Middlesborough-on-Tees.

Norwich.—The foundation-stone of new lecture, school, class, and other rooms about to be built in connection with Princes-street Congregational Church, was laid on Wednesday week, by Mr. J. J. Colman, M.P. The building will consist of a basement, ground, and first floors. The height of the assembly or large schoolroom will be 24ft. to the springing of a large plaster-panelled cove ceiling, which will have a lantern extending the whole length to give light; but the height from the floor to the top of the lantern will be 44ft. The works are being carried out by Mr. John Downing, builder, of Pitt-street, from the designs and under the superintendence of Mr. Edward Boardman. The outlay is £23,500 for site and £8,500 for building.

Preston.—The new Foresters' Hall, Preston, is now open, and some of its rooms are occupied the "Courts" of the Order. On the ground-floor there are news-room, card-room, secretary's office, with strong-room, bar, kitchen offices, lavatory, &c. On the first floor, three court-rooms, cloak-room, lavatory, &c. On the second-floor, a large assembly-room and a billiard-room with two tables. A hoist communicates with the various floors from the bar and kitchen. The various works have been carried out by local contractors, from the plans, and under supervision, of Mr. David Grant, architect, Preston.

St. Alban's Abbey.—At the Chancellor's Court of the diocese of St. Alban's, on Saturday week, the application of Sir Edmund Beckett for a faculty to carry out works of restoration at St. Alban's Abbey came before the Surrogate. Formal objection to the issue of the faculty was lodged in writing by Archdeacon Grant, by the rector of the parish, three churchwardens, one sidesman, and two other parishioners. The Court adjourned for a fortnight.

Sutterton.—The parish-church of Sutterton, South Lincolnshire, was reopened on Thursday, the 20th ult., after the restoration of the nave. The timbers and lead of roof have been repaired, a new floor has been laid several inches lower than the old one, and the arcade piers underpinned where found faulty. The greater part of the nave has been furnished with open benches of varnished pine to replace the old deal pews, but this work has not been completed. The pulpit has been removed from the south-western to the south-eastern angle of nave. The centre lancet at the east end of the chancel, which had previously been restored, has just been filled with stained glass, in memory of the vicar's mother, a daughter of Dr. Adam Clarke, the commentator; the subject is the Ascension, and it has been executed by Messrs. Burlison and Grylls, of London. The work has been executed under the direction of Mr. James Fowler, of Louth, by Mr. Beeby and Mr. Smith, of Sutterton, and Mr. J. M. Thompson, of Louth.

Upper Tooting, S.W.—A new Wesleyan chapel, of considerable architectural pretensions, was opened at Upper Tooting, on the 27th ultimo. It is a red brick building with Bath stone dressings, standing upon a somewhat peculiar site, and facing with its principal façade—the western end—the main thoroughfare. The style of architecture is of an Early Geometrical type. The building was commenced in September of last year, the contractors for the work being Messrs. Turtle and Appleton, builders, of New Wandsworth, S.W. The sculpture, as well as the rest of the carved work upon the building, has been executed by Mr. Harry Hems, of Exeter.

Wheatacre.—The chancel of Wheatacre parish-church, five miles from Beccles, was recently reopened after restoration. The plaster ceiling, rotten timbers, and old thatch have been replaced by a trussed rafter open-timber roof in pitch-pine, boarded in the same material, and covered with strawberry Staffordshire tiles. The external walls, which were covered with plaster and hard brick buttresses, have been faced in flint, new stone quoins and sets-off being introduced. A new east gable, with stone coping and cross, has been built, and the windows are all glazed with cathedral glass. Substantial oak benches have been introduced, and under these are laid wood floors with oak curbs; the passage and space within communion-rail are laid with Minton's tiles, the steps being of Portland stone. The new altar-table is of oak. The work has been executed by Mr. Allen, of Beccles, from the plans and under the superintendence of Mr. R. M. Phipson, of Norwich, diocesan surveyor.

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CHIPS.

The Corporation of Dublin, by a vote of 24 to 17, instituted on Monday week one of the most important sanitary and social reforms it has yet had courage to undertake — the establishment of a public abattoir. Great opposition was manifested by those residing in the neighbourhood of every suggested site, but the Corporation have determined to build opposite the Cattle Market and near the North Circular-road. A site of ten acres will be acquired at £50 an Irish acre.

At the close of the inquest on the men killed by the fall of a gallery, during an election meeting, at the skating-rink, Batley, near Dewsbury, the jury found that the cause of the accident was the breaking of the beams, which were of insufficient strength to support the gallery when filled with people, and strongly recommended that all public buildings should be examined and certified by the borough surveyor, previous to being let for public meetings.

At a meeting of the congregation of St. James's-street U.P. Church, Paisley, held on Monday week, three sites for a new place of worship were considered, and it was decided to adopt one in Underwood. It was subsequently agreed that the new church should accommodate 1,150 sittings, and cost not more than £8,000.

At a vestry meeting held in Folkestone Town Hall on Thursday in last week, plans were, after heated discussions and divisions, approved for a stained glass communion-window to be placed in the south aisle, representing a priest in vestments of fifteenth-century character, administering the chalice; another for a stained glass window in the north transept, and for a series of mural decorations, all for the embellishment of the parish-church of SS. Mary and Æauswythe, Folkestone.

A new Artillery Volunteers' Magazine is being built for the Government at Harty Ferry, near Faversham. Last week Joseph Butler, foreman to the contractors, Messrs. Foord, builders, of Rochester, committed suicide by hanging himself in the builders' shed.

The Aberdeen Harbour Board have decided, on the recommendation of their engineer, to proceed with the erection of a wall on the south side of the upper dock, and to follow this by the erection thereon of new offices, the deepening of the entrance channel, and the construction of a graving-dock, all works sanctioned by the recent private Act. The election of resident engineer has been adjourned.

At a meeting of the Carlisle Executive Committee for the Royal Agricultural Society's Show of 1880, to be held in that city, Mr. McKie, the city surveyor, was appointed engineer for the show, and instructed to prepare plans and estimates of the required works, which are estimated to cost at least £4,000.

John Rhodes, a "Steeple Jack" from Hull, while at work on the spire of Greenhorton Church, on Wednesday-week, was attacked with palpitation of the heart. By a hook in his belt he secured himself from falling, and, his position being noticed, he was rescued; but he died on the tower from heart-disease.

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[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J, Passmore Edwards.

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Cases for binding the half-yearly volumes, 2s. each.

Received.—C. Bros.—H. W. and Co.—O. L. B.—A. and Co.—M. and Co.—J. B.

"BUILDING NEWS" DESIGNING CLUB.

List of Subjects.—1. An open porch to a town residence in a street, to be designed in a pure Classic style, provision for lighting inner hall being made. The hall to be 10ft. wide and the depth of porch to be 8ft., the height of ground-floor rooms being 14ft. A rise of 18in. from pavement level to that of ground-floor. Material, stone. Scale, ½ an inch to the foot. Details, ¼ full size. 2. A small organ case, in pine, for a village church, about 6ft. wide and 12ft. high. Elevation, 1in. to the foot and details.

James Newman, Sandown. (Your comments upon the design selected for coffee-tavern would not have the desired effect. We are obliged to give prominence to those works which combine taste with good planning. We do not profess to publish models, but the nearest solutions of the problems we publish.)—Dalgarno. (Your criticism with regard to the plan of "Edwin" does not take into account the conditions for a country tavern of moderate size and requirements. We see no objection to make the public bar a passage to coffee-room; it would economise the service. The conveniences for caretaker are supposed to be obtained in the yard, but we are willing to admit certain defects, some of which we have pointed out. Your suggestion as regards style shall receive our attention.)

Drawings Received.—Alex Oakley, C. L. Bell, Tace, Heart and Arrow, Ogmore, Fleur-de-lis, Clansman, Semper Paratus, Burswell, B., Pro Bono Publico, K in circle, Rusticus, Stone, Gwyndwr, Mot, Wasp, Timeo, Lancaster, Set Square, Greyhound, Resurgam, Figaro, Motto T., No. 90, As You Like It, B. in circle, Castello, Frank Tireur, Edwin, Our Praises are Our Wages, Toltec, Domestic, Fidessa, Excel, Am I?, Mediocria Firma, Minted, War in circle, Hanglery, Gladstone v. Scott, Intersecting circles, Binney, Honey Dew, T.-square, Mill Bien, &c., Spray in circle.

◆

Correspondence.

EASTBOURNE TOWN HALL AND OFFICES COMPETITION.

To the Editor of the Building News.

Sir,—The above certainly deserves attention called to it on the part of architects, owing to the cool and unfair manner in which it is proposed to deal with members of the architectural profession; and if only my letter should cause a few of those who usually go in for competitions to think at least twice before risking the loss of time, &c., to gain such handsome remuneration for their pains, and at the same time helping to drag what should be an honourable profession down to the level of a third-rate "co-operative" store, my time will be well spent.

Surely some, if not all, the members of the Eastbourne Local Board are, or have been, tradesmen, and have always been in the habit of charging a fair price for their several wares according to the usual business mode; if so, then why have they the impudence—not to say ignorance—to ask professional men to give them £500 worth for £75 or £50, as their advertisement in your paper clearly does? The usual professional charge is 2½ per cent. for drawings, &c., and this on £20,000, the limited amount to be laid out, comes to £500; and yet the profession is coolly asked to compete for the honour of providing £500 worth for £75, and thus lowering himself and his fellow-artists at the same time.

I hope, Sir, that by drawing the attention of architects to such proceedings that yon will be able, at least, to prevent time and trouble being thrown away; and as the surveyor to the Board is to carry out the drawings, perhaps he'd better also make them.—I am, &c.,

A Competition Man of Eleven Years' Experience.

CARDIFF LIBRARY COMPETITION.

Sir,—Another apparently unfair start! Your correspondent lifts the veil that one may see how they manage things in Cardiff. Let the 500 applicants or all those who intend to compete fairly, protest and apply openly for a clean sheet of instructions. Hints valuable to all are often given to a privileged few, of course *sub rosâ*. That this course is often adopted none will doubt who have ever won a competition. A committee's pet idea, or the notion based on actual experience of a plan best suited to the requirements of an official curator, ought to be a great help to success; but these should be embodied so that no unfortunate competitor may have just cause for complaint afterwards and show himself

Envious of the Wicked.

BUILDING LAW.

Sir,—The cases constantly coming into court in light and air disputes, dangerous structures, &c., require, it seems to me, a professional tribunal of architectural experts. The ordinary judges, barristers, and jurymen, unaccustomed to geometrical drawings and most matters of construction, are assuredly unfit adjudicators. It's just a chance whether wrongs are righted, or rights confirmed. And now that so much street-building is going on, it is a great pity that the contemplated improvements should be retarded, as they constantly are, by the cupidity or stupidity of neighbours and rivals in trade. It is a common usage, when premises are being rebuilt, for the neighbours to wait until the structure is well on, and then to apply for an injunction by reason of supposed loss of light or air. A plausible case is stated, and the injunction, on insufficient grounds very often is granted. The stoppage of the works is necessarily a great loss and injury, so that in many cases unjust demands are complied with rather than wait; contest and delay being worse injury than the demand. So robbery is safely practised. If the demand is over-extortionate, the works have to stop, however great the loss in such case (and this is positive loss whatever the result of trial), and the case comes into court where, probably in the general ignorance, it's just a "toss up" who wins; probably the most impudent, most clamorous advocate gains the day. What can the ordinary jury of small tradesmen know of matters so entirely out of their experience? It requires some consideration, even for an architect, to examine sets of drawings, and form off-hand an opinion of their merits. That every wrong has a remedy is a legal axiom. Certainly a great wrong is here: the remedy is not so easy to discover. If such cases are to be decided in the common courts of law, there should at least be a special jury—experts. I do not see why it should not be made a part of the ordinary duties of the district surveyors that they should serve on such juries. Something should be done.—I am, &c.,

M.

MORTAR.

Sir,—As the severe winter weather is now beginning, when many bricklayers are thrown out of employment, it may be a subject of interest to the readers of your paper to invite the opinion of chemists and others as to the reason why mortar which is made from casters' sand, known here by the name of "black sand," can be used to build with in frosty weather with so much less risk of giving way than that made with what is called green sand.

Black sand has a large percentage of charcoal in it, and must have added a certain quantity of oxide of iron. Will either of these ingredients assist it in resisting the action of frost?

I have for many years used it in winter building with great success when I could get the bricklayer to mix with it an extra quantity of lime to that usually put to green sand to form mortar. Should any of your readers doubt the fact, I should be happy to show them some work done years ago in the frostiest of weather.

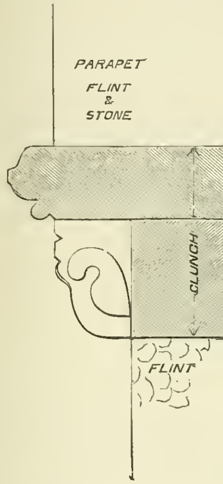
If the virtue of this sand were generally known, the winter months to a bricklayer would not be so unemployed as now.

Hoping yon will allow the subject, for the sake of the workmen, to be thoroughly ventilated in your columns,—I am, &c.,

Wolverhampton. Chas. Fredk. Clark.

THE CORBEL TABLE AT ST. ALBAN'S.

Sir,—In reply to Mr. White's challenge in your last, I send you a true section of the Early English stone corbel table (a portion now remaining *in situ*) which he alleges was composed of brick. His drawing supplies me with what I wanted, namely, to show to all who know anything about it, that his ideal Norman work was modern repairs, executed within the last 50 years. I need scarcely tell those who know St. Alban's Abbey that the mortar *joints* in the Norman work are nearly as thick as the Roman tiles themselves, that is, from 1¼ to 1¾in., whereas in Mr. White's section all are thin and modern.



If Mr. White will take the trouble to look at Carter's drawings, published in 1810, by the Society of Antiquaries, he will find in the south elevation not a trace of his brickwork, but the very corbel table which I now illustrate. I respect fair criticism, but persons who have a propensity for firing random shots must sometimes expect to get hit in return, however unpleasant it may be.—I am, &c.,

John Chapple.

THE FUTURE OF PORTLAND CEMENT.

Sir,—In the leading article which appeared in your number of yesterday on "The Future of Portland Cement" there are many points to which you have directed attention which should be seriously considered by all concerned in building operations. Portland cement having now become an almost indispensable agent in construction, its various peculiarities and characteristics should be freely discussed. Your arguments and calculations as to the relative costs of lime and Portland cement mortars should arouse the attention of every architect and engineer, and cause them to give this important question careful consideration. Much of the apathy hitherto and, I fear, still prevailing on the subject of Portland cement is due, in a great measure, to a want of confidence in its quality and reliability. In ordinary building operations "the intelligent Irishman" may be entrusted with the concoction of what, by a stretch of ingenious imagination, is called *mortar*, for any error arising from imperfect manipulation will be visited by the wrath of the bricklayer, who does not bargain to lay bricks with a mixture of lime and sand wherein "core" exists. The bricklayer may therefore be regarded as the "test" challenging the presence of core in the lime-mortar, and a very reliable one he may be considered, for the softer and more "putty"-like it is, the less wrist and muscle strain will be required of him. It generally matters little to the builder whether the specified or regulation mortar is capable of ultimate induration or not, for he has prepared it according to custom, and his responsibility may be considered at an end when the job is finished. There is not much danger to be apprehended from lime-mortar so prepared, for it cannot exert any very prejudicial action on any structure where it may be used. Mortar made from a mixture of imperfect Portland cement and sand is, however, a most dangerous material, and is competent to do serious mischief in any building where it passes unchallenged into the mason's or bricklayer's hands. To meet this difficulty preliminary testing is imperative, but I fear few, if any, builders take the trouble to do this, or even believe it to be necessary; it is quite sufficient for them if it has been purchased from an old-established firm of cement-makers, or as directed by the architect's specification. Under such circumstances it need not be surprising to find that so little is known about the quality of a good Portland cement, or the indifference prevailing as to the necessity of its being carefully tested before it is used in any structure, however insignificant.

In England the examination and testing of Portland cement has been confined to a few leading engineers, each of whom, unfortunately, take very different views of the nature and extent of its requirements. Such divergence of opinion has led to much confusion amongst consumers of cement, and no little bewilderment on the part of the makers. So much is this the case that I have seen, during my visits to cement works, several different qualities of cement specially prepared to meet the varying requirements of engineers. If engineers intrusted with most important works at home and abroad cannot fix on a common standard of test, we need not be surprised at the confusion generally prevailing on the subject of testing, both in regard to the method and the kind of instrument used. This state of things is due in a great measure to an absence of confidence between consumers and makers of Portland cement, and while it continues I see little chance of a common and uniform test being agreed upon. In Germany, where one fixed and admirable system of cement-testing exists, there can be no misunderstanding as to the method of its performance, for clear and distinct rules are laid down which anyone may understand. The mortar-test (28 days) is perhaps too long for ordinary practice, but it would be difficult to realise the best values of a good cement in much less time. As regards the best kind of sand, we would find no difficulty in London, at least, for a "standard" quality could be obtained from Thames ballasts of the finer sorts.

Reliable cement testing in this country is simply impossible, for the want of uniformity of the products from various cement manufactories realises the most unsatisfactory and bewildering results. I give below four of my latest examinations of cements during the last month. These tests were made for commercial purposes, on the results of which considerable supplies depended. It is satisfactory to me, at least, to find that our English cement makers are directing their attention to the important quality in a good Portland cement of fineness, and No. 4 is equal, if not superior, to the best German cement. If our makers gave anything like the same care and attention to their industry which the Germans do, we would have Portland cement of the highest quality *at a less cost* than the foreign makers can produce theirs at.

Results of Recent Tests.

No. 1.

A Portland cement made from a blend of

various chalk marls, produced under a semi-dry process; weight per bushel 118lb.

Fineness: 1,600 sieve, 5·75% rejection.
,, 2,500 ,, 8·0% ,,
,, 5,000 ,, 13·25% ,,

Tensile strength of neat cement briquettes seven days old, 213·4lb. per square inch.

No. 2.

A Medway cement, produced by the wet process from grey chalk and river mud. Weight per bushel, 121lb.

Fineness: 1,600 sieve, 7·5% rejection.
,, 2,500 ,, 14·5% ,,
,, 5,000 ,, 25·5% ,,

Tensile strength of neat cement briquettes seven days old, 382lb. per square inch.

No. 3.

A German cement, made by the wet process from chalk marl and pit clay. Weight per bushel, 112lb.

Fineness: 1,600 sieve, 1·25% rejection.
,, 2,500 ,, 3·5% ,,
,, 5,000 ,, 13% ,,

Tensile strength of neat cement briquettes seven days old, 545lb. per square inch.

No. 4.

A Thames cement, made from white chalk and river mud. Weight per bushel, 121lb.

Fineness: 1,600 sieve, 4·25% rejection.
,, 2,500 ,, 9·1% ,,
,, 5,000 ,, 19% ,,

Tensile strength 587lb. per square inch from briquettes of neat cement seven days old.

All the above tests were made with a double lever machine on briquettes having a breaking section of 1in.

With your remarks about the great advantages secured from the inventions of the gentlemen named I cannot agree. The only means of improving the quality and reliability of English Portland cement is first to seriously realise what is the nature of its manufacture, and until that much-to-be-desired time arrives any specific of reduced cost, &c., will be, I am afraid, listened to. It is not cheap cement that is wanted, for there is already too much of that; but we want quality above everything. Cement-making is simply a conversion of well-known and easily-managed raw materials through chemical and mechanical agency to a powder of double silicate of lime and alumina. The first process of rendering carbonate of lime hydraulic is accomplished by careful and accurate admixture of the best available materials; the second process, their accurate calcination; the third, the reduction of the clinkered mass to as fine a powder as possible. All these operations are distinct, and failure in one department means total failure in the resulting cement. An imperfect mixture in the wash-mill cannot be cured in the kiln, and the finest grinding is incompetent to remedy the defects of either.

I trust that your valuable remarks on this most important subject will lead to a thorough examination of not only the making, but the accurate and uniform testing, of the Portland cement of the future.—I am, &c.,

21, Arundel-st., W.C., Henry Reid.
Nov. 29.

Sir,—Will you kindly permit me, as an experimenter with cements, to endorse the very able remarks in your article upon the future of Portland cement. A very little reflection will show the importance of the sand-test, and fine grinding. Cement is a substance for the express purpose of being mixed with sand, and consequently, the greater the extensibility of the cement with the minimum of water, the greater will be the value of that cement, because it will go further in covering particles of sand and uniting them together. This property of extensibility can be well illustrated by means of examples with other substances. Perhaps the most notable is that of gelatine; one pound of this substance can be so mixed with water that it would unite together as much as 1,000lb. of sand, each grain of which would be covered with an envelope of gelatine in such a manner that if the sand be cast into a mould and dried, the block thus formed would stand a crushing test. This wonderful extensibility is owing to the very great dilution which gelatine will sustain, without loss of its cementing properties. Take another example, where there is no dilution by water. One pound of sulphur can be so mixed with 100lb. of hot sand, that each particle of sand will become covered with an envelope of sulpher, and if cast into a block, the sand will be so united together as to be quite capable of being tested under a crushing stress. Perhaps this latter example is the fairest for comparison with Portland cement, because the quantity of water necessary to bring cement into a plastic state is very small indeed.

Taking that quantity to be one-fifth the weight of the cement, it is evident, if Portland cement were as extensible as sulphur, then Portland cement could be mixed with 75 times its weight of sand, and stand a crushing stress some two or three times greater than the block made of 1 of sulphur to 100 of sand. It is not probable that there is at present in the market any Portland cement which would even hold together 75 times its weight of sand, far less bear a stress equal to that required to crush 1 of sulphur to 100 of sand. Looking upon the subject under this aspect, there yet remains a very great deal to be accomplished by the cement manufacturers before the limit of the extensibility of Portland cement has been reached by sifting and fine grinding. It would be a step in the right direction to institute a test of 1 of cement to 20 of sand, cast into suitable cubes for testing by crushing, after 30 days. Were such a test once established, it is quite within the range of probability the manufacturers will, in a few years' time, produce a cement so fine, that it would bear 40 times its weight of sand, without any diminution of the stress now required to crush a block with 20 of sand. Even this test of 40 of sand is only about half the extensibility which is possible with a fluid cement; so that a liberal margin is allowed for the drawback of having the cement in a powder. One cannot use too strong language to condemn the present method of testing cement, and I am glad you have employed your powerful influence to draw attention to its fallacious results, because the manufacturers will oppose the sensible sand-test, under the false idea that the quantity of cement now wasted by imperfect grinding increases their sales. It is very curious, but no less true, that the present method of testing is really an inducement to the manufacturer to supply coarse cement, because a finely-ground cement, although it might have really double the value to the consumer of a coarse cement, still, would give an inferior result under the existing method of testing.—I am, &c., A. C. P.

Parkstone, Dorset, Nov. 31.

Sir,—Has the writer of the above, in advocating the use of Portland cement for building purposes, taken into consideration the difficulties arising from the efflorescence of saltpetre on the face of a wall built in cement, penetrating the plastering, and destroying paint or any other kind of decorative finish to the same? That it has this effect I know to my cost, and have heard of many other instances from professional friends. I quite agree with the remarks generally, and should be glad to use the article more frequently when it becomes obtainable at a cheaper rate; but unless some remedy is found for the evil before-mentioned, it cannot be so largely used in house-building. B.

DRAWING INSTRUMENTS.

Sir,—It is an old saying and a wise one, that "bad workmen always complain of their tools," and I am afraid you correspondent "M." is an illustration of the truth of it. It would be interesting to have a list of his instruments, and the name of the maker, and what other instruments he has seen, to form such an outrageous opinion as he expressed in his letter; I have not had half the experience with instruments that he has, but still I think I can put him right on several matters.

(1) If he wishes to see a perfect set of drawing instruments, let him call at any of our first-class makers, and he will have his wish gratified, but he must expect to pay more than 7s. 6d. for a good set.

(2) His knowledge of curves must be very limited; in all respectable offices he will find curves which are *not* parts of a circle—nor yet conic sections only.

(3) The idea of the raised squares is absurd; for besides being clumsy, it would necessitate the inconvenience of having right and left handed squares. What objection has he to the present framed-squares, which entirely get over his supposed difficulty?

(4) If he has any fad about scales, the makers will graduate them to his own liking; but what can be gained by making the scales divided into 100 instead of 96 eighths? I should have thought that in his forty years' experience he would have had to use other scales than the ⅛ and inch.

(5) The reason his drawings get dirty is not because of the flat squares, but because of the dirt on the paper, on the squares, and on his hands: the two former should be wiped frequently during the day, and the latter washed more frequently; cover over the paper not being drawn upon with thin paper, *not* newspaper, and then there will be no occasion for him to exercise his ingenuity in designing ridiculous squares.—I am, &c. Soap-and-Water.

Hull, Dec. 3rd.

MATHEMATICAL INSTRUMENTS.

Sir,—Your correspondent "M.'s" letter in your issue of the 28th, needs, I think, some reply. I am unable, personally, to refer back forty years; but, from what I have seen of old instruments, they are not to be compared to those of the present generation.

To commence, "M." thinks too much of the point is left to project in pencil, bows, &c., and is, therefore, apt to be broken off; but if it were shorter, the receptacle for it, which he calls clumsy, but which must be of necessity larger than the lead itself, would so hide the point that it would be very difficult to adjust.

As to the instruments being clumsy and badly finished, I think reference to some of the best London makers, "Stanley's" for instance, would dispel that idea. I quite agree with him in his opinion on scales, but I have never found the "eighth" and "inch" scales more generally used than the "quarter." There is room for improvement also in curves.

No draughtsman desiring accuracy would use a parallel rule for ordinary drawing; besides its trouble and inconvenience. Has "M." never seen "the framed ebony-edged set-square"? Vulcanite set-squares are not made open, because, I suppose, they would not be strong enough and would be more liable to warp.—I am, &c., Ertiber.

ST. ALBAN'S RECTORY—ERRATA.

Sir,—Owing to (I suppose) my illegible handwriting, two mistakes were made in my letter, published in your last number, viz., for "with the date and scrawling over it," read "with the date sprawling over it;" and "for special nichemade," read "special bricks made."—I am, &c.,

An Irish Architect.

CHIPS.

The City Guilds Institute, having recently endowed a chair of Practical Fine Art in King's College, London, the council have appointed Prof. Philip H. Delamotte to fill the post. The new School of Art is to be opened early in January next.

Mr. F. Madox Brown has just finished the second cartoon of the series of illustrations of the history of Manchester, which he has been commissioned to execute in the town-hall of that city. The work is named "The Romans at Mancenion," and depicts the building of a fort or castrum near the present site of Manchester.

A memorial stained-glass window, representing full-size figures of Faith and Hope, and an engraved brass beneath, have been erected in the church at Nunhead Cemetery.

The Sub-Dean of Guild Court at Glasgow, Mr. Patrick Playfair, died on Friday last. At the Court on the same day the Lord Dean bore feeling testimony to the long experience, sound judgment, and unswerving integrity and impartiality of the late officer.

A brass eagle lectern, value £110, has just been placed in St. John's Wesleyan chapel, Manningham, near Bradford. It was made by Jones and Willis, of Birmingham and London.

The two easternmost side windows of the Lady-chapel at Chichester Cathedral are now being filled with stained glass by Messrs. Clayton and Bell. The subjects depicted are, the Marriage at Cana in Galilee and the incident in our Lord's life recorded in Matt. xii. 47: "Behold thy mother and thy brethren stand without." In the south choir aisle of the same cathedral workmen are now at work erecting the Dean Hook Memorial cenotaph.

New Board Schools are in course of completion at Tipton Green, near Wolverhampton. Mr. J. Adams is the contractor.

Intercommunication.

QUESTIONS.

[5969.]—**Burning Beech.**—I have been told by an architect of repute that burning beech-wood creates a secretion in the chimney that cannot be cleaned off, and eventually chokes up the flue. Have any readers any knowledge of this? I believe the French burn only beech, so I can hardly think the above is correct.—Radnor.

[5970.]—**Sound through Party-Walls.**—Living next door to a young ladies' school where piano practice goes on pretty continuously will probably have given rise to various methods more or less successful for preventing sound getting so readily through party-walls. If any of your numerous correspondents know of a simple and effective method to cure this defect it would be greatly appreciated. The wall in question is of uniform thickness—viz., 11in. (without chimney-breast, &c.), and is about 17ft. by 11ft.—Materfamilias.

[5971.]—**Builder's Charge for Plans.**—I shall feel obliged for information on the following:—A person wanted me to build him a house on a certain site, which I measured, and furnished him with plans. He desired them to be altered. I laid the plans before the Local Board, which they disapprove on account of this alteration being made. An amended plan was made, which they approved. My employer desired other alterations, which caused new plans to be made, with specification on which our contract was based. Can I charge for this labour, and what shall I charge?—W. W.

[5972.]—**Varnish on Print.**—I have had an old architectural print varnished, and some thick dark varnish that has been in a bottle for years has been used. It has been very badly put on. Will any of your readers inform me how best to remove it without damaging the print?—I. P. C.

[5973.]—**Taking Angles with Theodolite.**—I should be glad if any one could explain the method of reading the angles taken with the "theodolite," and the manner of checking same in the field. In turning the glass from one station to another in the direction of 360°, am I right in supposing the reading given (when the glass is fixed on the other station), to be the correct angle, and by subtracting it from 180° gives the corresponding reading on the opposite vernier, proves the angle first taken? Or in turning the glass back from 360° towards 00, is it correct to subtract the reading from 360°? In each case the instrument is set at Zero before commencing operations. Any information will oblige—A Learner.

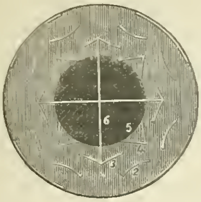
REPLIES.

[5946.]—**Rain-Water and Domestic Water Supply.**—In my paper I stated that when a capacity of more than 200 cubic feet is required I consider it advantageous to have two or more small tanks rather than one large one, and consequently in the table of capacities for those above 200 cubic feet, I give the size of two tanks bracketted together, and a very little consideration would have shown "Puzzled" that the number of cubic feet capacity would require two tanks of the size given, and that the approximate cost included the two. It may be well to state in conclusion, as I did in the discussion at Croydon, that the estimate of cost is, if anything, rather high, and that the calculations are based on the yield from a tiled roof, and with a slated roof the supply would be about 10 per cent greater.—H. Sowerby Wallis, F. M. S., 1, Springfield-road, N.W.

[5954.]—**Clay-Grinding Machinery.**—We beg to inform "M. R." we have in use at our works a combined clay-grinding mill and brick-making machine that for simplicity and economy is, we believe, without a rival. It readily grinds at rate 70 or 80 tons of tough clay and converts it, without any manual labour, into bricks of any design. We have no objection to allow "M. R." to make—free of expense—a trial of his clay in this machine if he will arrange with us a suitable time for doing so.—Candy and Co., Great Western Pottery and Patent Brick Works, Chudleigh-road station, near Newton Abbott.

[5959.]—**Brown Ink.**—To "I. G.'s" query regarding brown ink for coloured perspectives, my idea is to avoid lining them up as much as possible—it makes them "hard"; but if it is necessary that he should line them, do it after colouring, and only where necessary—not with ink, but some rich brown, such as vandyke or sepia and lake mixed. There is a brown ink made by G. Rowney and Co., useful for etching, and I dare say might do for the purpose.—N. P.

[5956.]—**Deflecting Ventilators.**—In reply to the query put by "J. R." to "G. H. G.," "what is a deflecting ventilator?" I beg to give him some information on that point. A deflecting ventilator consists of a number of plates or strips of metal so arranged in relation to each other that the wind impinging upon them is deflected at certain angles from one to the other, and in its passage draws the air out through the spaces between the plates which communicate with the interior of the ventilator. The place of the air thus drawn out is immediately filled with air from the apartment being ventilated, it passing up the shaft into the body of the ventilator to be removed in turn. From the arrangement of the deflecting plates and diaphragms the direction given to the external current is always outwards, so that no air can pass in through the slits and cause a down-draught. By the kindness of Messrs. Robert Boyle and Sons, the inventors of what I consider the most perfect forms of deflecting ventilators, I am enabled to give you a plan of their patent self-acting air-pump ventilator, which will give you a much better idea of the construction of a deflecting ventilator than any mere description could possible do. This ventilator consists of four sections, each acting independent of the other. Figure 1 shows a curved baffle-plate or guard to concentrate the current and prevent the wind from blowing through the slits opposite communicating with the internal chambers. 2, a curved plate to take the pressure off the vertical slits and prevent down-draughts. The external air impinging on the diaphragm, 3, is deflected on to the central radial plate, 4, creating an induced current and drawing the air through the vertical slits from the internal chamber, 5. 6, partitions separating the chambers and preventing the external air from being drawn through the slits upon which the wind is not directly acting. This ventilator is so ingeniously contrived that no matter from what direction the wind may blow the effect upon it is always the same, and it has also the great merit of being a fixture, having no movable parts to get out of order or require attention.—W. F.



[5967.]—**Outlet for Heated Air.**—If "Enquirer" permits the heated air to find its way into the space between the ceiling and the roof, and makes openings either in the roof or gables for its exit, a hundred chances to one but that the external air rushes in through these openings, cools the heated air, and precipitates it, loaded with poisonous germs, the products of respiration and combustion, to the level from whence it arose, at the same time causing a disagreeable and dangerous down-draught. In the winter, when ventilation is most required, owing to the greater quantity of gas burned, and our staying more indoors, and exhausting the air in our rooms, this plan could not be used without dangerous results. Even though no openings are made in the roof or gables, the heated and exhausted air passing into the attic gets cooled coming in contact with the cold roof, and immediately descends to be rebreathed. This, in conjunction with the great quantity of exposed glass forming the windows, is the chief cause of the disagreeable draughts experienced in churches and other buildings having open roofs. I would recommend "Enquirer" to make an opening in the centre of the ceiling and lead a pipe from it up through the roof in connection with an extracting ventilator. The size of the opening in the ceiling, pipe, and ventilator would of course be regulated by the size of the room to be ventilated, and the purpose for which it is used, but I think "Enquirer" could not do better than put himself into communication with some one of our leading firms of ventilating engineers. Boyle and Son's (of Glasgow) air-pump ventilator would, in my opinion, meet his requirements.—W. F.

WATER SUPPLY AND SANITARY MATTERS.

Lower Thames Valley Main Sewerage Board.—Notice has been given by the Board that they intend applying to the Local Government Board for a provisional order enabling them to put in force the provisions of the Lands Clauses Consolidation Acts, 1845, 1860, and 1869, with respect to the purchase and taking of lands otherwise than by agreement for the purposes for which the Lower Thames Valley Main Sewerage District was formed, and for, *inter alia*, the construction of sewerage and sewage works, and works for the purification, utilisation, filtration, and disposal of the sewage of the said district, and for the erection of pumping and lifting stations, tanks, machinery, and plant, and for any purposes connected with the carrying out of a system of sewerage for the said district.

Metropolis Waterworks Purchase.—Notice has been given that an application will be made to Parliament next Session for leave to bring in a Bill to authorise the purchase by agreement or compulsion to a metropolitan water trust, to be constituted by the intended Act, and the vesting in it of the undertakings of the metropolitan water companies. Powers will be asked, enabling the trust, subject to the provisions of the Act, to exercise the rights and powers of the companies, and to carry on the acquired undertakings; for the dissolution of the companies, the creation and guarantee of stock, borrowing, rating, and other powers, and the amendment of Acts. The companies whose undertakings will be sought to be acquired wholly or in part are the New River, the East London, the Southwark and Vauxhall, the West Middlesex, the Lambeth, the Chelsea, the Grand Junction, and the Kent.

LEGAL INTELLIGENCE.

Dangerous Buildings.—Late on Saturday afternoon an application was made at Marlborough-street Police-court by Mr. Robert Walker, district surveyor, on behalf of the Metropolitan Board of Works, for an immediate order to remove the inmates of the house, No. 10, Union-street, Hanover-square. Applicant stated that he had that afternoon been instructed by the board to survey and report as to the safety of this and the adjoining property. He found the north party-wall of the house No. 10 extremely dangerous. It was bulged and partly crushed at the foundation, and a portion of it had been squeezed out at the base, and in its fall had injured a child belonging to a large family who lived in the basement. The house was filled with lodgers on every floor, and though applicant had succeeded in getting the board's contractor to undertake to shore up the premises that night, yet he was afraid loss of life might occur. Mr. Mansfield said the case appeared to him similar to one which lately happened when some houses suddenly fell near Red Lion-square, Holborn, and he should, therefore, grant an immediate order to remove the inmates, and directed a constable to see it carried out at once.

Parsons v. Timewell.—This was an appeal in the Queen's Bench Division, before Justices Lush and Manisty, from the decision of Mr. Ellison, the police-magistrate, under the Metropolitan Board of Works Act. It appeared that in June, 1876, the respondent obtained the permission of the Metropolitan Board of Works for the erection of an iron building, to be used for two years, known as the Marble Rink, Clapham-road. In June, 1878, the appellant, Mr. Parsons, the district surveyor, gave the respondent notice that the time for the existence of the erection had expired, and required that it should be removed at the expense of the latter. No application was made for an extension of the time, and the respondent having failed to comply with the notice, a summons was taken out, which came on for hearing before Mr. Ellison, who decided that there was no provision in the Act for the compulsory removal of a temporary building erected under the circumstances described, and dismissed the summons.—Without calling upon Mr. White, the Court said it was quite clear that this was an omission in the Act, and that, consequently, the magistrate had no jurisdiction, and was right in dismissing the summons. The only way was for the Board of Works, in all similar cases in the future, to take a bond from the builders, and so bring pressure to bear on the parties if they refused to remove the buildings when required to do so.

Stainbank v. Beckett.—This was an action in the Exchequer Division, before the Lord Chief Justice Baron and Mr. Justice Stephen, for libel, brought by a member of a firm of bellfounders, in Whitechapel, against Sir Edmund Beckett, to recover damages in respect of certain allegations contained in letters written by the defendant concerning "Big Ben," which was cast by the plaintiff's firm. The defendant denied that the alleged libel applied to the plaintiff, inasmuch as the plaintiff was not a member of the firm at the time when "Big Ben" was cast. The case came before the Court on appeal from Chambers in reference to the mode in which the statement of defence had been drawn up, it being contended on behalf of the plaintiff that the defendant should deny or not admit each of the allegations contained in the statement of claim specifically and not generally. Their lordships gave judgment in favour of the defendant.

CHIPS.

A new coffee-tavern, at Mutford Bridge, near Lowestoft, was opened on Tuesday week. It is in the Queen Anne style, and is built of red and white bricks, with dressings of the same materials. The chief room is 38ft. by 17ft., and 15ft. high. Mr. Glover, of Lowestoft, was the architect; and Messrs. Calver and Halesworth, of Bungay, the builders. The cost has been £1,000.

The foundation-stone of a new church, to be dedicated to St. John, was laid in Ault-street, Spon-lane, near West Bromwich, on Saturday.

Yet another Local Government Board inquiry with reference to the drainage and sewerage of Dorking and Leatherhead, was held before Mr. Arnold Taylor, C.E., inspector, on Tuesday week, at the latter town. The authorities of the two towns have at length agreed to a union for the purpose of carrying out a joint scheme, and this inquiry was for the purpose of settling the boundaries.

At a meeting held on Monday evening at Derby, it was decided to take steps for the erection of a new church in the district of New Zealand, in St. John's parish, Derby.

A new brick circus has been erected in the Above-Bar-street, Southampton, for Mr. Batty, from the designs, and under the direction of, Mr. Arthur Martin, architect, of that town, the builder being Mr. Watts. It was opened last Monday, having been finished in the short space of three weeks, and was certified as safe by the borough engineer before the first performance commenced, a species of "lightning architecture," to borrow an American phrase.

It is in contemplation by the authorities of Canterbury Cathedral to enlarge the accommodation afforded to the French Protestant Church in the crypt of that edifice. Mr. James Neale, F.S.A., of the Adelphi, London, has been consulted, and has prepared plans for the work.

Our Office Table.

By a recent German patent of O. Löwe of Munich, artificial stone masses are produced thus:—Sand, or a mixture of sand with clay, gypsum, or chalk, is dried at a high temperature, then mixed with finely-powdered caustic lime and colophonium, and pressed, when hot, in moulds. Thus, *e.g.*, one composition for yellowish sandstone is, fine sand 80, colophonium 17, burnt lime, 3. For artificial marble (slightly yellow to white), coarse white sand, 30, chalk, 42, colophonium, 24, burnt lime, 4. In order to complete the combination of the lime with the two isomeric acids of colophonium, the moulds, after stamping in the mixture, may be kept 15 to 20 minutes at about 160° C., then allowed slowly to cool. Instead of lime, baryta, magnesia, and sometimes zinc-oxide may be used. These stone masses are said to present excellent resistance to atmospheric influences.

A correspondent of the *Salisbury Journal* sends the following copy of a letter written on the 16th June, 1788, by a glazier, one John Berry, of Harnham, to Mr. John Lloyd, of Conduit-street, Hanover-square:—

> Sir,—This day I have sent you a Box full of old Staind and Painted Glass as you desired me to due wich I hope it will sute your Purpos it his the best that I can get at Present. But I expet to Beatt to Peceais a great deale verey sune as it his of now use to we and we Due it for the lead if you want Eney more of the same sorts you may have what thear his, if it will Pay for Taking out, as it his a Deal of Truble to what Beating it to Peceais his you will send me a line as soon as Posobl for we are goain to move ore glazing shop to a Nother Plase and thin we to save a greatt Deale more of the like sort wich I ham your most Omble Servnt John Berry.

The original, endorsed "Berry ye Glazier about beating the fine painted Glass Window at Sarum to pieces to save the Lead!!" is in the possession of Miss Conway Griffith, in North Wales.

It is stated in one of the Church papers that an official connected with St. Bartholomew's, Smithfield, has expressed his intention of selling the fabric of that grand old Priory Church unless aid is forthcoming to repair it. "Whether any official has the power to sell the fabric," writes a correspondent of the *Standard*, "I know not; but surely the Churchmen of the wealthiest city in the world can find money enough to repair such an interesting relic of old London. What remains there are of the Priory buildings, besides the choir and tower, I do not know personally; but according to 'Allen's History of London,' the eastern Lady chapel is now a store or dwelling-house, the south transept a burial enclosure, the chapter-house a Dissenting place of worship, and the eastern alley of the cloisters and undercroft of the dormitory are converted into cellars. Why cannot these be rescued from destruction and restored to the church?"

The convention of the American Institute of Architects assembled on Wednesday, November 19, at New York, continuing through that day and the next. A number of papers on interesting topics were read: one on the Proper Distribution of Weights to secure Equal Pressure on Foundations in Soft Soils, by Mr. F. Bauman, C.E., of Chicago; an Account of the Architectural Course at the College of the City of New York, by Professor Russell Sturgis, F.A.I.A.; on the Proportion of Inlet and Outlet Shafts in Ventilation, by Mr. Lewis Leeds of New York; on Atelier Instruction in Europe, by Mr. Wm. Watson, Ph.D., of Boston; one on Influence of Size and Shape of City Lots on every Part of Houses built thereon, with illustrations of American and Italian stairways, by Mr. E. T. Potter, architect, of Newport; on Domestic Architecture as illustrated by the Early Dutch Settlers in New Jersey, by Mr. J. C. Cady, F.A.I.A., of New York; and on the Decorative Quality of Early Italian Painters, by Professor Charles Eliot Norton, of Harvard University. The papers for the Thursday session were, in the morning, on Some Suggestions for the Improved Construction of Building Acts, by Mr. Alfred Stone, F.A.I.A., of Providence; on Some Causes of Failures in American Architectural Designs, by Mr. W. A. Potter, F.A.I.A., of New York; on Interesting Devices of Fire-Proof Houses in Paris, by Mr. Watson, with illustrations; and on the Typical Sanitary House, by Mr. T. M. Clark, A.A.I.A., of Boston; in the afternoon, on Greek Antiquities, the result of a recent visit by Mr. Joseph T. Clarke, junior member of the Boston Chapter; and on Reminiscences of Viollet-le-Duc, by Mr. Edward Raht, architect, of New York.

Articles of hardware have shared largely in the general advance of prices in the United States, especially those that are used in house-building. Whether the rise is sufficient to justify experimental shipments under the present tariff is a question for manufacturers' own consideration or calculation. Nails are 70 per cent. higher than they were at the beginning of the year; locks and door-knobs have risen 40 per cent., window-weights 75 per cent., common butts and hinges 100 per cent., tacks and kindred articles 25 per cent., and such other varieties of hardware as are used in building, an average of 40 per cent. Common window-glass has advanced 20 per cent. since January. A box of sash-glass, 15in. by 30in. costs 3·90 dols. to-day, against 2·98 at the beginning of the year; a box of 10in. by 15in. sashes costs 2·70 dols. now, against 2.10 dols. in January; and a box of 13½in. by 26in. sashes costs 3 dols. to-day against 2·50 dols. at the opening of the year.

In the House of Keys of the Isle of Man Legislature on Thursday and Friday last, warm discussion took place with reference to the proposal for restoring the cathedral church of St. Germain on Peel Castle Island. Several members protested against the project, declaring it will only spoil a romantic and beautiful ruin; that the site is so inaccessible that the only congregation to the seventy "performers" would be sparrows, bats, and gulls; and that if a cathedral were built, it should be erected in Douglas. It seems, however, from the reports in the Isle of Man newspapers, that the *odium theologicum* has much to do with the opposition, for one speaker suggested that a cathedral would afford ground for another manifestation of Ritualism, and another questioned the greater right of the Church than other religious bodies to erect a place of worship in Peel Castle ruins. The secretary to the House showed that the site belonged to the Church, and said that the necessary arrangements were being made for the restoration which was a positively settled thing. By a majority of one, the House affirmed the expediency of establishing a cathedral church in the island, the site to be settled by the bishop of the diocese, by consent of the governor and council, and the subject dropped.

The annual "Green Book" of the Birmingham Architectural Association for the session 1879-80 has just been issued, and this year is not a very cheerful pamphlet. The committee, in their annual report, regret that they cannot express their complete satisfaction with the progress made, although the session was commenced and carried on to its close in a fairly successful manner. The financial position of the association continued so unsatisfactory that, as it was utterly impossible to decrease the working expenses, the alternative was adopted of raising the subscriptions—ordinary members to 15s. and honorary subscribers to one guinea per annum—and the head association in London have generously promised to return one-third of the annual payment as a grant, so long as such assistance shall be necessary. The classes in connection with London were fairly successful, and the meetings of these classes were generally well attended. The half-hour time sketches were entirely omitted, and will not be again resumed. The open meetings did not prove beneficial, and were discontinued early in the session. The Life class will also be abandoned. The Saturday afternoon visits were numerously attended, but a favourable report cannot be given as to the sketchbook. The balance-sheet shows a total expenditure of £57 9s. 9d., and in place of a balance in hand of £2 17s. 5½d., the position is reversed, and there is a sum due to the treasurer of £18 7s. 9½d., towards which arrears of subscriptions ought to produce £5 15s. 6d. The list of members enumerates 29 in the ordinary and 13 in the honorary class. The local prizes for Birmingham members, offered in addition to those of the London Association, are:—Class of Design.—For the best series of designs, one guinea. Elementary Class of Design.—For the best series of designs, one guinea. Class of Construction.—For the best series of papers, one guinea. The following is the syllabus of meetings, which, together with the classes, are held on Tuesday evenings:—December 16th, annual meeting: Address by President, Mr. William Hale, and reception of annual report. January 27th, paper by Mr. William Roddis on "Art Legends and Symbols." February 24th, paper by Mr. J. W. Tonks on "Architectural Metal Work." March 23rd, paper by Mr. T. W. Camm on "Poetry in relation to Art." April 20th, paper by Mr. A. Reading, "From Strasbourg to Cologne." May 18th, paper by Mr. W. H. Kendrick on "Decoration." June 8th, the closing meeting of the session and election of officers. The time of meeting is 7.15 p.m.

Last week a party-wall about 25ft. long, forming a portion of some old buildings in Gravel-lane, Southwark, which had been condemned by the Board of Works, fell, and buried several workmen engaged in the ruins. Two men were dug out, one of whom died at Guy's Hospital, and another is said to be in a precarious state. We understand from inquiry that the site of the wall belongs to the railway company, whose viaducts cross this part of Gravel-lane, and that the cause of the accident was the pressure of a large quantity of bricks which had been carelessly allowed to rest against the wall in question, which should have been shored up.

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CHIPS.

The Archbishop of York, on Monday, consecrated the new parish-church of St. Hilda's, at Egton, near Whitby. The building is of stone, and will seat about 300 persons. The architect is Mr. E. H. Smales, and the builder Mr. W. Barton, of Whitby.

The Eberle restaurant, Liverpool, lately completed from the designs of Mr. E. Kirby, was totally destroyed by fire on Sunday night.

The parish-church of Rastrick, near Halifax, was reopened on Saturday, after restoration, from the designs and under the superintendence of Mr. W. S. Barber, of Halifax. The works include the erection of an organ-chamber, and the removal thereto from the west gallery of the organ, the filling-in of the east window with stained glass representing the Transfiguration—work which has been carried out by Messrs. Powell Bros., of Leeds—mural decoration on the apse ceiling, the subjects being "The Goodly Fellowship of the Prophets" and "The Apostles and Martyrs," new pulpit of oak and lectern of brass, decoration of gallery front, and provision of ventilation.

The new Ovenden line of the Great Northern Railway, affording a new route from Halifax to Bradford, was opened for passenger traffic on Monday.

At the last meeting of the Tewkesbury Abbey restoration committee, it was decided to remove the remaining portion of the thick wall between the north transept and the 13th century Masonic chapel, and to restore the ancient screen as far as possible, in accordance with designs to be prepared by their architect, Mr. J. O. Scott. It was stated that £5,000 was needed to complete the restoration of the abbey.

Bethel Chapel, Ovenden, will be reopened to-morrow (Saturday) after extensive alterations, including repewing, the erection of a gallery and new rostrum. All the woodwork is in pitch-pine, varnished. The walls have been decorated in colour, and a new organ, built by Messrs. Connacher and Co., of Huddersfield, erected. The work has been carried out under contracts, of which the principal were taken by Mr. J. E. Rushworth and Mr. Brenard, of Ovenden, from the designs and under the superintendance of Messrs. Leeming and Leeming, architects, Northgate-chambers, Halifax.

St. James's Church, Brighouse, is being decorated as a memorial to the late Mr. W. Ledgard. The designs are by Messrs. Morris and Co., of London, and are being carried out under the superintendence of Mr. F. R. Leach, of Cambridge.

At a meeting held on Monday week, at Hartshead, near Halifax, it was decided to carry out the restoration of the parish-church, and Mr. W. Swinden Barber, of Halifax, was appointed architect to the restoration committee.

New schools for 206 infants, built by the Liversedge School Board at Millbridge, were formally opened on Monday week.

The subscribers to a memorial to the late Archdeacon Mildmay, met at Chelmsford, on Monday week, and adopted a design prepared by Mr. A. W. Blomfield, M.A., for a screen and arch of stone, to be erected on the south side of the chancel of St. Mary's parish-church, Chelmsford.

THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 12, 1879.

ROYAL ACADEMY MEDALS AND PRIZES.

THE annual distribution of medals and prizes took place last Wednesday, the 10th inst., being the anniversary of the foundation of the Royal Academy. Being the first gold-medal night since the election of Sir Frederick Leighton as President, there was an unusually large attendance. The chair was taken at 9 p.m., and the President announced that the competitions this year had been unusually brilliant, so much so that additional medals had been awarded in the gold medal competition for architecture, the Turner gold medal competition for landscape, and for the drawings from the life. He then proceeded to award the following medals and prizes:—

Gold medal for painting, historical subject, "The Pool of Bethesda," M. Le Thangue.

Turner gold medal, Mr. Henry Gibbs.

Extra silver medal, Mr. Frank Miles.

Painting of head from life, Mr. C. Knight Warren, first medal.

Painting of head from life, Mr. William Henshall, second medal.

Painting of head from life, Mr. Chadwick, extra medal.

Copy of painting, Mr. S. J. Hayes, medal.

Drawing from life, Mr. C. Knight Warren, first medal.

Drawing from life, Mr. S. J. Hayes, second medal.

Painting from life, Mr. Griffenhagen, £10 premium.

Drawing of head from life, Miss Edith Savill, medal.

Composition in sculpture of "Discovery of Dead Body of Abel by Adam and Eve," Mr. Lee, travelling studentship.

Gold medal for sculpture, "Venus Rescuing Æneas from Diomede," Mr. F. Colcutt.

Modelling from life, Mr. F. Piercy, silver medal.

Model of group, Mr. F. Colcutt, second medal.

Drawing of head (antique), Mr. J. J. Way, first medal.

Drawing of head (antique), Miss Mary Dealy, second medal.

Best drawing from antique, Miss Mary Dealy, £10 premium.

Gold medal in architecture, Mr. F. T. Baggallay. Subject, "A Baptistry."

Extra silver medal, Mr. J. Powell Ince.

Travelling studentship, Mr. R. W. Gibson. Subject, "Town Residence for a Royal Prince."

Measured drawing, "Aylmer de Valence Tomb," Mr. F. Miller.

Armitage prizes. Subject, "Bringing Sick Persons to Temple of Æsculapius." First prize, Mr. H. Smythson; second prize, Mr. T. Hill.

After the award of the medals, the President delivered his biennial address, which will be found elsewhere.

The subject for the gold medal was a baptistry, which in the "Dictionary" of the Architectural Publication Society is defined to be "an octagonal building, adjunct to a church, but forming no part of it; the centre portion being a large hall, in the centre of which would be placed the great octagon bath, which, strictly speaking, was the baptistry; the sides parted off and divided into rooms, used as chapels for private baptism (probably for women), for vestries and schoolrooms."

All the drawings were sent in under mottoes. "Detur digniori" (by Mr. F. T. Baggallay, to whom the gold medal and scholarship of £25, tenable for two years, was awarded) is the motto on a magnificent series of drawings, most completely worked out in all their details. The centre block is octagonal on plan, and is surrounded by an aisle communicating with three chapels, and the entrance vestibule, placed at the four cardinal points of the compass (supposing the building to be orientated), and eight smaller recesses or chapels, arranged in couples between the three chapels and vestibule above cited. The section shows a ground-story opening into the aisles with eight arches; a triforium above, with two arches on each face of the octagon, each subdivided into two smaller ones; these open into the upper part of the aisles, on the sides subtending the smaller chapels, and are blocked up on the sides of the larger chapels, which latter rise through two stories and form distinctive features outside, with gable ends facing the cardinal points. Above ranges a clerestory, through the windows in which, in the side aisles above the smaller chapels, and in the larger chapels, the interior of the baptistry is lighted. The clerestory windows consist of a rose window, and four smaller lights below to each face of the octagon. The hall, as well as side aisles, vestibule, and chapels, are all vaulted. The roof of centre hall is in timber, covered with lead, as well as the flèche or crowning feature. Externally, above the rose windows of the clerestory, runs an arcade, crowning the building and affording light to the interior of the roof. The entrance-doorway and vestibule has been most carefully worked out, and we notice the difficulty with which the author here (as in all the other designs) has had to contend in the comparative narrowness of the width of each front. The portal, of several orders, the outer one enriched with pierced cusps, and two others with carving, is flanked by a blank arch on either side, which, whilst adding, perhaps, to the dignity of the portal, suggests weakness of abutment. Above these is a centre gable and two side gablets, the centre one masking too much the rose window above, and being too close a repetition of the upper gable which crowns the vestibule. This is more noticeable in the perspective, where also we must take slight exception to the heaviness of the blank tracery, and the finials or terminations of the angle buttresses of the central building, which are unpleasing in design, and might have had figures of angels instead. The lines of vaulting, section of mouldings, carving of capitals, are all well shown, and the suggested decoration of the vaulting, shown in lighter ink, is well drawn, as all the other figure-subjects and the sculpture.

"Corde manuque," by Mr. J. Powell Ince, to whom an extra silver medal was awarded, adopts also an octagon plan, with entrance-front and side aisles, but no chapels. The aisle is lofty, and the arches into it from central hall rise the full height of the aisle. There is no triforium, but a clerestory with triplet window on each face. The aisle and centre hall is vaulted, as in the last design, with a roof in timber covered with lead. The eight elevations of the baptistry are all similar in design, with the exception of the entrance-front; here the porch looks too large for the building it gives access to, having six orders of arches, the abutment of which is much too slight. The gable over this porch looks unusually heavy, from the fact that it apparently runs back to the mullions of the window behind, so that the sill of the same seems to form a portion of it. Feeling that the sill, if carried up to the top of the gable, would hide too much of the window, the upper portion is cut short; precedents for which are to be found in Tintern and other abbeys. It would not have done, however, to omit the top of gable in front, and the author therefore attempts to get over the difficulty by the insertion of a niche, with pinnacles on each side, the gable of this niche rising to the full height. It would seem to have been better to have carried up an independent gable, carrying down the window-sill behind. Otherwise the design is very carefully worked out, the drawings being all excellent in execution, particularly the drawing of the porch, which is unusually vigorous and good.

Circle with a Cross is a Classic design; circular on plan, with twelve counterforts or buttresses, between which are placed inside a series of niches vaulted with pendentives and half-domes—a peculiar and not satisfactory feature. Above these is a range of circular arches subdivided by columns carrying a cornice and tympanum pierced with circular windows; the whole surmounted by a dome, which it seems to us would be rather dark. The construction of the roof over this, and the means taken to carry the ponderous monument above, with central figure group of four others at its base, are not shown. Externally the counterforts are square on section, and carry $\frac{3}{4}$-detached columns, with capitals supporting figures, there being no entablature between the two, as is usually found in similar features in Greek and Roman work. A balustrade, with pedestals and figures, crowns the building below the dome. The lions on pedestals at the base are unsatisfactory, and extend beyond the limits of the area given, viz., 80ft. diameter.

"Firenze," a design of Romanesque character, octagon in plan, with seven chapels and entrance porch. There are no side-aisles, but a narrow opening only between the chapels, 2ft. wide, isolating the piers carrying the inner wall of the centre block. The outer walls are carried on transverse arches across the chapels, reducing the roofs over same, which are covered with half-domes in stone. On the second story is a triforium gallery, the windows being on the inner wall, and the outer wall being pierced with a series of semicircular openings with statues in them; the loss of light and apparent size internally being scarcely compensated for by the depth of shadow thus afforded behind the statues. The building is crowned by an external dome in stone with a heavy lantern on the top. It is very problematical whether such a dome could ever be constructed to carry itself and the lantern; and it is certain that in this country the wet could not be kept out from such a structure. The entrance-porch is simple in design, but its roof accords ill with the semi-domes over the chapels. The perspective, though cleverly drawn, is very unfinished in its tinting.

For the travelling studentship the subject given was "A Town Residence for a Royal Prince," to be erected on a plot of ground 350ft. by 250ft., the principal elevation to face the south, and a fall in the site of 22ft. from west to east, and 15ft. from north to south. The mansion to be visible on all sides, and to contain on the first floor a suitable arrangement of reception-rooms, with a grand staircase leading to them, and a domestic chapel. Neither of the two competitors seem to have grasped the peculiarity of the site, having prepared symmetrical designs suitable for level ground, and trusted to terraces to get over the difficulty of the inclination.

"Domns," by Mr. R. W. Gibson, to whom the travelling studentship was awarded, places his mansion in the centre of the site, with about 40ft. to 50ft. in front for the approaches, the entrance being at the west, or highest end, and on the same level, or nearly so, as the entrance and ground-floor; the descent, commencing on the east side of porch, extending to the east wall of site, and returning on a lower level, so as to enter the street again almost in the centre. The use of the corresponding gate on the other side of centre is not clear, except as an entrance for foot-passengers, who can reach the entrance porch by a double flight of steps without going round the carriage-way. The descent of one in fourteen, which the slope in front means, would scarcely seem to call for its subdivision into level pavements and three flights of steps. The state-rooms on the first floor are placed round a central cortile, like the hall of the Reform Club, and with a similar staircase. Round this court runs a corridor, bringing the whole of the rooms into immediate communication. On the east and west side the apartments are double, there being a ballroom and gallery on the west side, and a dining-room and gallery on the east; this was, perhaps, rather a superabundance, the inconveniences of which would have been felt had the ground-floor plan arrangements been asked for. On the south and main front are the state reception-rooms (placed too far away from the main staircase), with a saloon in each end block; on the north front, on east side of staircase (which is wanting in grandeur), are the private apartments and chapel, which balance one another. What, therefore, should have constituted a special feature at the north-east end, viz., the chapel, is masked and passed over.

The elevation, Classic in design, is much too plain and severe in its character for its destination, and objection must be taken to the windows, which are all much too small; and, being subdivided with heavy stone mullions and transoms, would light very inefficiently the vast rooms inside. The terrace wall in front is broken into three heights, and is surmounted by a monotonous arcade running along the top. The perspective is delicately drawn.

"Vires acquirit eundo." In this design, as in the last, the mansion is symmetrical, and placed in the centre of the ground. The entrance is at the west end on the level of the porch, and the exit at the east end, with a descent of one in eight, which would be rather rapid. The grand staircase is well placed in the centre of the building. The state reception-rooms are on the main front; at the back, and reached by circuitous passages, are the sculpture and picture-galleries, with a ball-room in the centre; the latter can also be reached through the conservatory at the back of staircase. The state dining-room is placed on the west side, and the chapel (again masked as a distinctive feature outside) and small dining-room on the east side. The arrangement of plan is defective, because there is no proper thoroughfare between the reception-rooms in the front, and the ball-room and galleries at the back. Six very small areas for light and ventilation, two semicircular breakneck staircases, deficiency of light in the hall beneath conservatory, and the position of the billiard-room on the left of entrance, are all serious errors in the plan, to which insufficient attention has been given, owing probably to the limited time allowed.

The elevation is Gothic, of Early French type, and well known. The importance of both ground and first-floor is lessened somewhat by the height of second floor, and the unusual size of the dormer windows, which are out of scale. The importance given to the tower in the centre makes the building resemble a town-hall rather than a mansion, and the forbidding aspect of the external walls suggests a fortress. The perspective is well drawn and etched.

THE ASSOCIATION OF MUNICIPAL ENGINEERS AND SURVEYORS.

THE proceedings of the recent meeting of the Association of Municipal and Sanitary Engineers and Surveyors, which took place at Merton, will be found fully reported elsewhere. We call more particular attention to that part of the discussion which dealt with the question of the proposal to institute an examination, and to grant certificates of competency in sanitary science to local surveyors and inspectors of nuisances. Whatever may be entertained of the desirability or otherwise of submitting those who have to carry out as surveyors the provisions of the Public Health Acts to an examination, it is not surprising that the Association of Municipal Surveyors should have resented, in almost indignant terms, the proposal of the Sanitary Institute of Great Britain to undertake the office of examiners. It is hardly to be expected that so experienced a body of sanitarians as the members of the Association, and which includes many of the leading borough engineers and surveyors in the kingdom, would submit to be examined in the elements of sanitary knowledge by a comparatively young and inexperienced board of self-elected members, however competent they may be for the task. The president of the Association, Mr. Pritchard, dealt with the question in a practical way; he first dwelt on the necessity for examination, and secondly asked whether the Sanitary Institute was the proper authority to conduct it and grant certificates of competency. The question has been, we understand, under the consideration of the Council of the Association, who have seen the advantage, in their own interests, of improving the educational status of those who offer themselves as candidates for surveyorships. Of course the difficulty that exists in establishing a test of proficiency in a profession which from time immemorial has been recruited from the experienced ranks of engineers and surveyors, is the natural reluctance felt by the senior members to an innovation, the absolute necessity for which they have never experienced. The engineering and sanitary requirements of our towns have been a growth of years; they have been forced upon the attention of surveyors since the introduction of the Public Health Act; failures and their lessons have gradually created the class of officers who now occupy posts; and it was not to be expected new that they would take kindly to a mode of qualification which might place the younger and less-experienced on an equal footing. The complex nature of sanitary science, and the multifarious duties required of the surveyor, show that the old modes of training are defective and inadequate. The lessons of experience which our senior surveyors have acquired have been slowly and dearly purchased; we have learnt the essentials of sanitary requirements through years of blundering. These essentials have now accumulated and form a compact body of knowledge, and it seems obvious enough that we should now endeavour, by more expeditious methods, to instruct our surveyors and engineers in principles so hardly acquired. The surveyors of the past had to pick up their facts as they best could. It is our duty now to ease the road to this knowledge. The president spoke, the other day, on the necessity of protection to surveyors. Now, we believe the only true way of obtaining protection, of getting public bodies to respect their officers, is to organise a system of training that shall place officers above the paltry inducements which now actuate elections of this sort, and to make them independent of favouritism. The fitness of the Sanitary Institute to undertake the business of examining and granting certificates is another question. Its juvenility and want of prestige would, as we have just seen, operate prejudicially against its assuming the function it aspires to. At the same time, as Captain Galton observed when replying to the objections made, the Institute had taken the initiative, believing that some test of qualification was essential, and while, therefore, we are obliged to admit its unfitness to assume authority to conduct examinations, we must give the Institute Council credit for having endeavoured to carry out its aims as the promoter of hygiene and sanitary knowledge. The Institute was established not merely to hold congresses, but to enter into the technical work of teaching and examining; it professes to organise co-operation, not only to amend and make laws relating to public health, but to form a school of hygiene, in which practical science and engineering construction will form a part, and to hold annual exhibitions of sanitary appliances for the promotion of excellence of workmanship, and to stimulate invention in sanitary matters. We see, therefore, its aims are rather high, and that it professes to trench closely upon the practical work of the Association. The discussion on the subject shows, by the remarks made by Mr. Jones, of Ealing, that the latter body repudiated the idea of professional men of twenty-five to thirty years' standing being taught by the Institute, and suggested that the Institution of Civil Engineers would be the proper body to grant certificates. The same view was concurred in by Mr. Craggs, who opposed the idea of officers of health appointing themselves examiners, and also by Mr. Angell, who, in our opinion, hit upon the right body to conduct this work, namely, the University of London, an opinion that was endorsed by Captain Galton himself. It may not be generally known that the Institute of British Architects have lately introduced a clause to enable them to grant diplomas to members before admission, and it is well to bear in mind that a desire to test in some manner the knowledge of aspirants to other professions has been lately shown on the part of many other professional bodies.

The papers read at the Association, reported elsewhere, were of a practical nature. Mr. Craggs's idea of making a junction block that shall do away with imperfect joints at the manhole, and which provides means by which the sewage may be shut off and repairs can be made, and the manhole may be charged with water for flushing purposes, is one deserving the attention of all engineers. The cost of the blocks is not great, as a 12in. block would cost about 6s. 3d. We also call attention to the useful hint of placing the outlet block 2 or 3in. above the bottom of the manhole, so that the deposit which always takes place at this part can be removed. We refer our readers to the points discussed in relation to this paper, and to that of Mr. W. S. Crimp, on the sewerage works for Croydon "rural" district, which was read at the same meeting. Mr. Graham Smith's paper on Ironwork, which we shall not comment upon here, was a useful contribution, and its writer echoed the recommendations of many of our American brethren, whose practical experience in ironwork must be acknowledged. Considerations such as those referred to by Mr. Smith, affecting theoretical deductions as to the precise conditions of fixing iron beams, the variation of camber and strains produced by changes of temperature—which. under some circumstances, will produce, according to the author, the same effect as $5\frac{1}{2}$ tons per square inch actual load; the necessary qualities of iron, and the injury often caused by the processes of manufacture, are of fundamental importance in all constructions in which iron is employed, and are deserving of the first attention of the architect and engineer.

AMENDMENTS TO BUILDING BY-LAWS, PROPOSED BY THE ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.

THE Institute of the Architects of Ireland have been discussing the proposed by-laws issued by the Local Government Board, and have submitted a series of amendments for the consideration of the Board. They have found, as other societies of professional architects have done, that the by-laws relating to building will, in many cases, have the effect of "increasing the cost of new buildings for the poor by from 20 to 30 per cent. in average cases," and will be practically prohibitive of all improvement by private enterprise. From a perusal of the amendments now before us, and the remarks appended thereto, we think the Council of the Institute have made out some good reasons for a relaxation of some of the restrictions which will affect the dwellings of the poorer classes in Dublin, and that such amendments would still leave provision for the absolute requirements of the sanitary condition of the houses. One of the proposals, relating to clause 7, which provides that the site of every new domestic building shall be covered by a layer of cement, concrete, or asphalte, suggests that "six" inches should read *four* inches thick, and that the addition should be made "or with a layer of lime riddlings, broken brick, or other clean, absorbent, dry material to the satisfaction of the sanitary authority, thoroughly drained to the best available outfall." The Council say, in their "remark," that the experience of architects is against the provision of an impervious bed of concrete over the whole site of a house. "This would mean," they add "in many cases in Dublin a damp and unwholesome house, from condensation (in some instances found untenantable), injurious to timber, and adding without necessity to the cost of the poorer houses." We cannot quite understand why a layer of impervious material would mean a damp house, from condensation, and this remark appears to us to require a little explanation. A layer of dry porous material, and a well-drained site are, however, all that can be fairly required to keep a house dry and wholesome. The Council propose, also, an alteration in the clause 8, referring to mortar; they think the proportion laid down, namely, 3 of sand to 1 of cement, is excessive and unheard of, and suggest the proportion of 5 to 1, though, in the proposed substitution it is stated, "not less than five parts of cement to one of sand"; this, of course, is an error, and requires correction. What concrete should really be appears not very clear in the by-laws, and it is thought necessary that the term "concrete" should be accurately defined; the Council therefore suggest, at page 294, at end of paragraph 9, that it be composed of "One part of good Portland cement, in due condition, to not more than seven parts of clean ballast, free from loam, broken stones, bricks, clinkers, breeze, or other incombustible materials, duly and evenly mixed, by admeasurement, with clean water; or of one part of fresh-ground lias lime to not more than six parts of similar materials similarly approved." Another suggestion that would tend to reduce the cost of building in rocky districts is the insertion after "footings," "unless it be erected on a level bed of natural rock." As regards the thickness of walls, the Council recommend an amendment to clause 38, the effect of which would be, that walls built of good concrete may be *one-third* less the thickness specified for brick. As drawn, the clause does not define thickness of concrete, and would leave the opportunity for builders to erect walls of materials not contemplated. The prescribed proportion for concrete, of the London Building Act, in this particular, as justly observed, was determined upon when concrete-building was a novelty; but if applied to walls now, it would prohibit or restrict, to a large extent, the use of concrete as a valuable and economical material, and be specially operative against the provision of cheap dwellings. We are glad the Council have objected to this clause for another reason that applies with greater force, and that is the unquestioned advantage of concrete for sanitary purposes. Clauses 41 and 42, relating to parapets, are proposed to be omitted altogether. In Dublin the necessity of such features as parapets is open to doubt; they are quite novel there, and the provisions made in respect of them would entail unnecessary expense.

In the clauses of the by-laws referring to provisions for fireproof building an exception is taken to clause 69 (3). The Council remark, "This provision, as it stands, taken from the 'London Building Act,' is by universal assent and experience obsolete, useless, and embarassing, and will be amended in that Act, and is perpetuated in no other Building Act in the Kingdom. Under it would be prevented the enclosing of ordinary hot-water circulating pipes as practised without danger or objection in many thousands of houses." There is more reason, perhaps, in the objection to clause 74 as operating to increase the cost of artisans' dwellings on the tenement or block system, by providing solid party-walls, and fire-proof arching of floors between separate tenements in the same building. In Dublin the application of Clause 2 would make a rather sweeping and costly reform in the case of shops with offices over them, and an amended clause is recommended as follows:—"Sets of chambers or rooms contained in one building tenanted by different persons shall be divided by walls of incombustible materials, and if contained in any building exceeding 3,600 square feet in area be deemed to consist of two or more separate buildings, and to be divided accordingly, so far as they adjoin vertically by party-walls." The by-law relating to structures suspended or projecting, as lamps and signs, does not find favour with the Institute. Projecting structures such as these are common in Dublin and provincial towns, and it is submitted that such things cannot be held to come within the conditions of security, stability, the prevention of fires, and the purposes of health. It is affirmed that this clause is of the nature of an æsthetic by-law which, if it had force, might be unreasonably exercised to the annoyance of citizens. We are obliged to withhold our consent from this view of the case: it may be that the by-law is too severe, and in that case it would have a diametrically opposite effect to the contemplated one; but the danger and nuisance arising from suspended and overhanging structures—we are willing to admit their picturesqueness—cannot be denied, and the sooner there are some rules in force to protect the pedestrian, and to prevent accident to head or limb, the better.

We note, among other amendments, the remark that a flue 10in. in diameter has an area of 78·54in., in relation to Clause 88; that the provision of laying drains in beds of concrete is calculated to increase the cost of drainage work in Dublin, especially of poorer dwellings, and with reference to carrying up soil-pipes for ventilation to the top of a house, that it would entail unreasonable expense in many cases to carry them up "without diminution of diameter." An addition of a sentence is proposed requiring each such pipe to be closely painted, to avoid leakage. From a careful review of the amendments, we certainly think that sanitary construction would be better insured in the dwellings of the labouring classes of Dublin and other cities if the Local Government Board reconsidered the points submitted to them, and that Board should be careful not to hamper with unnecessary conditions, which circumstances alone should control, the erection of new buildings.

THE ARCHITECTURAL ASSOCIATION DRAWINGS.

THE drawings by members of the Architectural Association, which were exhibited at the Conversazione last Friday evening, indicate improvement in many particulars. In the first place, the subjects given in the Class of Design are moderate in scale, not the high-flown and often visionary problems proposed; they are generally designs for buildings of every-day use. Thus Mr. John Bilson, who takes the first prize in the classes of Design and Construction, contributes a design for a pair of semi-detached villas to cost £3,500. The pair is conceived in a simple, quiet, yet dignified manner, in a 17th-century style. The upper story is tiled, and timber framing is introduced to relieve the gables. The cubing is put at 8d. a foot. The same student's shops and offices are effectively treated in a sensible brick style, and his design for a refreshment-pavilion for a park is cleverly and simply grouped, with a well-designed refreshment bar and covered way. The high-tiled roofs are effective, and the perspective and pencil elevations cleverly drawn, and we believe, from the work of Mr. Bilson, that he will ere long become an acquisition to the class in which he has already made a mark. In the competition for a design for a town church to seat 1,000, Mr. T. H. Smith wins the second prize, for a building treated in an Early Pointed style; the gable end, and tower and spire, show a knowledge of detail that only needs practice to develop. Mr. Smith's design for villa has a good plan, and the style of François I. is suitable. Mr. A. H. W. Bridge's design for town house is not without merit. The "Queen Anne" has been selected as the style, and the summit is crowned by a high brick gable; we do not like so well the semi-detached villas: the gable is heavy, and the detail is too fussy. Some very clever studies for colour decorations drew our attention. We must mention with commendation Mr. Shuffrey's very pleasing design for the side of a drawing-room, which takes the first prize. The treatment is Japanese; the dado of a geometrical tile pattern partly in relief; the medallions in the frieze are spirited, and the colouring very simple and in quiet harmony. The sunflower wall-paper pattern, in light tints of blue and green, would be exceedingly rich. We cannot omit to notice also Mr. M. C. Hulbert's sketches for stencilling in green and red, and a rich frieze of foliage treated with considerable spirit and feeling. Mr. E. Eldon Deane's sketches also for stained-glass windows are particularly rich in colour, and are designed in good keeping.

Mr. H. W. Moore, whose design has been selected for the Silver Medal, has produced a well-balanced, simply treated elevation for a country hotel, in red brick and stone designed in the style of the early Renaissance. The details are worked out with care; there is a central tower capped capped by a high roof. The lines of the tower would have been improved if the projecting stacks shown on the upper story were not allowed to oversail the walls below. On examining the plan we find the author has paid due regard to essential requirements; the rooms are well disposed, and the bar and corridors are well lighted by an area. The commercial room is conveniently placed on the right, and the coffee-room on the left of entrance; the stairs are suitably placed and lighted, and the manager's suite is obtained on the first floor. Mr. Hemings' elevation, which has won a special prize, is in a mixed French and English style, to judge from the drawing; red brick with deep stone bands between the stories are introduced, making a rather strong contrast; the upper story projects and is timber framed; altogether the effect is heavy, and the detail somewhat coarse. The plan also has a few defects; we point more particularly to the narrow staircase and the ill lighted and ventilated w-c. placed in the centre of hotel. "Excelsior" is the motto of a design quietly treated in Late Gothic, in which the material is stone, the roof being relieved by high-roofed dormers over bay windows. The plan is certainly not so good, and the staircase is inconveniently narrow.

The measured drawings show some careful study. "Audax" (Mr. Leonard Stokes) is represented by the choir arcade of Pershore Abbey, a fine example of Early English or Transitional work; the drawings are executed with boldness, and the detail is not lacking in precision. The drawings of Christchurch Cathedral, Dublin, showing one bay; and the Reliquary, Gloucester Cathedral, are creditable works.

THE INSTITUTE OF PAINTERS IN WATER-COLOURS WINTER EXHIBITION.

THE water-colour drawings at the Institute of Painters in Pall Mall are, speaking generally, equal to those of former exhibitions. We observe in the catalogue of exhibitors many of the same names whose works have greeted us on previous occasions —among them the works of Absolon, Guido R. Bach, Cattermole, Bouvier, Clausen, Gow, H. Hine Leitch, Linton, Seymour, Lucas, Wimperis, Whymper, L. J. Wood, Fulleylove, Vacher, are conspicuous. The opaque mode of treatment, so frequent among the sensational class of water-colour artists, is happily in abeyance, and the subjects are well chosen in variety. There are several studies and compositions, and a fair display of landscapes and sketches illustrative of national habits and character. Mr. Augustus Bouvier sends no less than eleven subjects in his usual vein. For ideal power and delicacy of colouring we must award Mr. Bouvier a meed of praise; but those who are punctilious in anatomical drawing will have no difficulty in finding fault with some of his figures. "The Necklace" is a charmingly-conceived drawing of a girl, slightly draped, holding with both hands a pearl necklace, upon which she is threading beads, but we are certainly rather doubtful about the correctness of the drawing of the arms and hands. Again his study "At the Fountain" (94), though almost faultless as a composition, betrays a decided weakness in the hands and the pose of the maiden, particularly in the position of the feet, which hardly seem to stand restfully on the marble floor. The raised foot is unnatural. No. 233, "Tympanistria," is open to stricture on similar grounds, and "The Garland" (354) is a trifle too air-drawn. The chalk heads, "Sauce Box" and "Little Grumpy," are clever studies, graceful in outline, and drawn with much spirit. Mr. Harry Hine is also a prolific contributor, though a trifle hazy in his work, and certainly a firm believer in the effectiveness of broad flat tints and unsophisticated handiwork. "The Beggars' Roost, Allaford" (10), "Market Place, Sandwich, Kent," "Moated Grange, Hitchin" (28), and "In the Horner Valley, Somerset" (87), are all pleasing and transparent sketches in colour, giving one the impression of unfinished water-colours in their light aërial effects. Mr. Hine is very happy in his management of transparent tints; his pictures are wrought from a high tone, but there is a soft gradation of colour thinly laid on with precision. His "Moated Grange" is a study of rapidity of effect and simple execution; the same remark applies to No. 87, the foliage and bridge in which are delineated with charming dexterity in flat tints of clear colour. "East Coast of Ireland" (19), is a bold and crisp piece of colouring, perhaps verging on crudeness, but the rocks and foreground are boldly delineated. No. 11, "Contrast," by John Absolon, sustains this master's reputation as a water-colourist of the genuine school. It is a bright, sunny picture; the scene is supposed to be in Brittany, and the leading characters a young fair lady, fashionably attired, speaking to a pretty peasant, clad in the picturesque costume, with dark complexion; the artist has chosen the title apparently to convey the contrast between the conventionally-dressed blonde and the simple brunette. The stone cottage and surrounding landscape are broadly handled, and a transparency of tone pervades the picture. Mrs. W. Oliver sends a pretty sketch of an Avenue, in No. 22; the foliage of the trees is light and spray-like, but the execution too finikin. "A Question of Date," by Seymour Lucas, is a well-finished study. An old antiquary is standing in an attitude of reflection before an old chest and some armour, endeavouring to fix upon the age of the treasure before him. The large-skirted coat of silk, and the expression of the countenance are cleverly delineated, and there is a touch of humour in the treatment. Mr. E. G. Warren, in No. 34, represents "Robin Hood's Larder, or the Shamble Oak, Sherwood Forest," a grand trunk of ancestral age boldly coloured. A well-known artist of architectural subjects, Mr. L. J. Wood, contributes, as usual, several very pleasing sketches of Continental street scenery, a class of subject especially familiar to his pencil. There is much in the selection and handling of Mr. Wood that reminds us of Prout; indeed these drawings, in one sense, are quite Proutesque, "The Cathedral at Vere, Normandy" (41); "Porch of St. Germains, Amiens" (47), the sketch of the "Old Church of Laurent, Rouen," and the sketches of the Porch at Louviers, and the Church of St. Etienne, are in tone and feeling suggestive of the latter master; but there is this difference—that while Prout, in Ruskin's words, could "abstract into a few steady lines" what he saw, Mr. Wood's style of drawing is too essentially dotty and mannered, and we lose much of the charm of repose. The busy groups of figures in the foregrounds are picturesque and the colouring rich, and much of the transparency of these drawings depends on the rough straw paper this artist works upon. The "Porch of St. Germains" is rich in depth of colour, No. 122 is certainly spotty in the Late Pointed detail, while the perspective is not faultless. A finely-studied landscape, broad in its colouring and well handled in its effects of light and shade, is Mr. E. M. Wimperis's "Sunny Showers" (45); the mountain and the middle distance, illumined by the sun through a hazy atmosphere, are cleverly painted. "A Royalist," by G. G. Kilburne, is a highly-finished picture; the red velvet jacket trimmed with white fur, and the white satin dress, are exquisitely rendered, the dark background setting off, by contrast, the richness of the costume. Passing Mr. Wolf's curious picture of "Storks" (55), and Mr. G. Clausen's striking study "Going to Market" (60), a finely-rendered group of figures, in misty atmosphere, our eyes rest on a view of Hampton Court, by J. Fulleylove, a heavily-coloured drawing of the garden-front, with some thickly-painted trees. The management of colour is too thick. A more striking work is Mr. J. D. Linton's "Flag of Truce," in which the artist depicts the outer gateway of a French fortress beleagured by the enemy. The restive horse, and soldier upon it, and the countenances of the gate-keepers, in their wide-frilled collars, are drawn with spirit and animation. It is an anxious moment, and the expression of those who have given the order to raise the banner, and the impatience of the horseman, make a thrilling picture. The grouping and colouring, no less than the detail of the architecture, are truthfully detailed. Very faithful is Mr. E. Hargitt's "View in the Isle of Wight." Mr. Mole's view near Bettws-y-Coed is less successful—it lacks repose; "Stragglers" exhibit Mr. Andrew Gow's ability as a figure-painter, and we must not pass by Mr. Edmund E. Warren's "Harvest in Devon," though there is an elaborate attempt at finish in the trees that spoils the field of golden wheat so truthfully rendered. One of the most vigorous composition studies on the walls is Guido R. Bach's picture, No. 85, sketch for his "Alms-day at the Ara Cœli, Rome." The group of figures of men and women awaiting relief, and the fine porch, are drawn with masterly effect. A weird subject, rather cleverly treated, is Mr. Harry Johnson's picture of "Haunted" (91). The scene is a lonely cottage, standing at the foot of a mountain, enshrouded in the evening darkness, the *ignis fatuus* in the low marshy swamp behind the house. The "Path in the Wood," by E. M. Wimperis, is a spirited drawing of foliage. The "Falls of the Rhine" (98) is clever in the atmospheric effects conveyed. The rainbows and mountains are especially well done. Mr. C. Vacher's "Temple of Calabschi, Nubia," (120) shows a fine ruined temple, bathed in the warm light of the sun; and we must not pass over Mr. W. Lucas's "Scene from Nicholas Nickleby" (126), which the artist values at the tidy little figure of 300 guineas. The incident recorded in Mr. Lucas's picture is that in which Mr. Squeers, while beating a boy, is arrested by the outspoken Nicholas Nickleby. The chief fault we have to find with the work is the attitude and inexpression of the latter character, who is shown as a well-dressed young gentleman in black dress-coat, rather out of keeping with the school depicted. A bold, solid piece of colouring is the "Interior of a Church at Cologne" (133), by Guido R. Bach; while the cabinet sketches by W. L. Leitch (135 and 197) show a masterly pencil. A grand bit of atmospheric effect is "The Break in the Storm" (202), by William L Thomas, who has here, as in other instances, presented us with a fine Alpine peak, piercing the clouds that cover its base; the clouds and sunlit rift are admirably depicted. We cannot admire Mr. Charles Vacher's large sunny picture of "Naples and Vesuvius" (206)—it has too much of the chromo-litho look about it, and the expanse of the bay is overpowering. Rather hard and meagre in detail is the late Mr. Chase's "Terrace View of Haddon Hall"; but we must pause to admire the exquisitely truthful and life-like drawing of Mr. T. Walter Wilson, in his "Jilted" (228), and "Such Witching Looks" (248). These works combine the vigorous realistic effect with a dexterous management of transparent colour that is refreshing after the Flemish precision and elaboration of some and the crude handling of other artists. The high lights are taken out, and Mr. Wilson evidently makes use of his sponge freely in the fine mottled and granular manipulation he is such a master in. The broad sunlight on the grass meadow and the cleverly drawn figures in "Jilted" are equal to the other study, the picture of which we have had occasion to notice before. Mr. A. Gow's "Old Bachelor" is painstakingly done, but rather laboured in execution; there is also a want of decision in Mr. H. Carter's "Dutch Fisherfolk" (255); while a word of praise is due to Mr. G. Clausen's clever sketch of girl in 261. We must particularly call attention to the grace and delicacy of handling in Emily Farmer's study of a girl's face called "A Pleasant Thought" (272). The countenance is pleasing, childlike, and the features are lighted up by a radiant thought, in the most inimitable manner. The "Waiting for Water" (265), by Frank W. W. Topham, is also a clever study of grouping the figures, and the marble panels of bas-reliefs are well drawn. We must also note in commendation Mr. Thomas's "Ribbon Road, St. Gothard Pass": the altitude of the mountain is cleverly conveyed. We appear to realise the magnificent scale of this Swiss pass.

A few other drawings call for mention, but we can only distinguish them by number: these are 220, 238, 241, 262, 271 (a fine valley), 277, 282, 284, 302, 310, 327, 332, 334. On the screens we notice some exquisite studies by W. L. Leitch (343), some decorative subjects by Augustus Bouvier, and one or two humorous sketches of costume by C. Green (356 and 357); also No. 361, and a charming group of flowers by Mrs. W. Duffield (364).

In a small room leading out of the end of the gallery there is a collection of sketches in black and white, that claim a brief notice. We must particularly draw attention to the interesting and facetious sketches in pen and ink, by T. W. Wilson, illustrating Dramatic Notes (137-143), Mr. W. Smale's charmingly-finished studies in black and white, for Illustrations to "Under one Roof" (168, 169, 150, 174, 175), &c., quite cabinet pictures in their way; a fine study of head, by H. Herkomer; the eight studies in pencil by L.J. Wood, illustrating bits of architecture from Ghent, Frankfort, Gottingen, &c., and one or two sepia studies by Charles Cattermole. Those who wish to pass an hour or two among some of the works of the leading artists in water-colours, will do well to pay a visit to this exhibition.

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THE ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS, AT MERTON.

THE members of this association held a district meeting in the new Pumping Station, at Merton, near Wimbledon, which has been constructed in connection with the sewerage scheme now being carried out by Mr. Baldwin Latham, M.I.C.E., for the Croydon Rural Sanitary Authority, on Friday. The chair was taken by the President, Mr. E. Pritchard, C.E., F.G.S., of Birmingham, who delivered an

INAUGURAL ADDRESS.

In his opening remarks, the President quoted from a letter, written by Mr. R. Rawlinson, C.B., to the Association last year, in which he urged each member to strive to leave his district better than he found it, and showing money's worth as the result of labour and capital expended, adding that, "each sanitary engineer is, in his work, writing history which will be more enduring than the loftiest and proudest architecture." These sentiments should be those of every member of the association; indeed, judging from the energy displayed by the members of the Association, the President believed Mr. Rawlinson's admonition was kept steadily in view by each member, and he hoped that his prediction as to the permanency of their works would be fully realised. But their association was not the only body desirous of improving the sanitary condition of society. The Sanitary Institute of Great Britain also took up the principle, and judging from a few extracts from a circular issued by them, it desired not only to assist society in its attempts to provide health-preserving appliances, but it also further wished to improve the professional standing of the local surveyors themselves, and, to add weight to their action in this direction, the Institute proposed:—"To obtain, as early as possible, on behalf of the Institute, a charter of incorporation," and in its solicitude for the welfare of the municipal engineer and surveyor, proposed to determine by examination his fitness for the office he desired to occupy; in the words of the Institute circular, "To examine and grant certificates of competency to local surveyors and inspectors of nuisances. . . . . A board of examiners shall be appointed by the council; such board shall consist of gentlemen representing sanitary science, chemistry, engineering, architecture, and sanitary jurisprudence. . . . . The examinations of local surveyors shall include a competent knowledge of the statutes relating to sanitary authorities, of sanitary science and construction, and of engineering." This programme suggested two points for consideration: (1) Was such an examination as the one proposed for the office of local surveyor necessary or sufficient? (2) If an examination were necessary, was the Sanitary Institute of Great Britain the proper authority to conduct such an examination, and grant the certificate of competency? As the Institution of Civil Engineers, and the Royal Institute of British Architects, two thoroughly representative societies incorporated by Royal charter, did not submit their members to examination, the first point was, at least, debatable. As to the second, the Sanitary Institute numbered in its ranks some eminent names, but the conduct of such an examination must, of necessity, be considerably weakened by the fact of its being entirely a self-elected body, which had yet to furnish proof of its fitness for the position it would assume. The whole question was under careful consideration by the Council of their Association in consequence of the action taken by his predecessor in the chair, Mr. G. F. Deacon, and by Messrs. Angell and Ellice-Clark. He would turn next to the subject of Government protection, a suggestion which had been strongly supported by some, and as warmly condemned by others who had occupied the presidential chair. The Acts of 1847 and 1848, which gave official existence to the sanitary engineer and surveyor, also gave protection to the local surveyor, who performed his duties in an impartial and legitimate manner. It was difficult to understand why subsequent legislation had reversed this, and had transferred the kind of protection once enjoyed by the surveyor to the medical officer of health and the inspector of nuisances. The duties of the town surveyor very frequently were of so onerous and peculiar a description that any attempt to enforce the carrying out of sanitary regulations in a perfectly impartial manner would simply render him obnoxious to many persons interested, and, in some instances, would even render him liable to dismissal, his only error being that he served not wisely, but too well. Mr. Lewis Angell had conclusively shown, he thought, by the evidence he adduced, that for the surveyors in small districts nothing short of that protection which was afforded the less important officer, the inspector of nuisances, would avail. He trusted that some means would be devised by their Council by which a clause similar to that contained in the Public Health Act of 1848 might be inserted in an early supplemental Act. He congratulated the members that, notwithstanding the great depression in trade in the past year, engineering works of great importance had been carried out in connection with water supply and sewerage of towns and rural districts, and that schemes of considerable magnitude were also projected. The consideration of tramways had also occupied a considerable portion of the attention of the municipal engineer and surveyor, nearly every town of any importance having either a tramway in operation or now in course of completion. Lastly, he urged the importance of such an association as theirs to enable surveyors and engineers to compare notes and learn new processes, or better modes of destroying or mitigating the disease-producing agencies found in bad water, foul gases, defective ventilation, and other enemies of human life, and thus to enable them, in Mr. Rawlinson's words, to leave their districts better than they found them.

Mr. C. Jones, of Ealing, said the question of the Sanitary Institute's proposed examinations was one of very great importance to all surveyors. Personally, he had a very decided objection to the scheme. (Hear, hear.) Surveyors who had been at work for 25 or 30 years would hardly feel disposed to undergo an examination; but, apart from that, was the Sanitary Institute of Great Britain a fit examining body? The members were men of culture and thoroughly in earnest, but not the people to undertake examinations of surveyors. Lady members were eligible for membership, and would they be put on the examining board? If examinations must be, although he did not see the necessity for them, let the work be done by the Institution of Civil Engineers, from whose hands a certificate would be a real mark of honour. The granting of a charter to the Sanitary Institute should be actively opposed.

Mr. Jas. Craggs, of Old Shildon, concurred in Mr. Jones's last remark, saying he strongly objected to medical officers of health appointing themselves as examiners of surveyors.

Mr. Angell, of West Ham, said he was not opposed to examinations; on the contrary, he thought it desirable that candidates for surveyorships should have passed one. But he protested against a new body, who had only been in existence a few minutes, setting themselves up to examine the members of the engineering profession. He should suggest that the University of London would be a suitable examining body, for their diplomas would carry weight. He had seen the questions put by the Sanitary Institute to candidates, which were most absurd.

Mr. Baldwin Latham, of Croydon rural district, said the best test of a surveyor already in practice was to examine his district.

Captain Douglas Galton, C.B., as a member of the Sanitary Institute, asked permission as a visitor to reply to the charges that had been made. As one of the examiners, he must say that although the questions put were remarkably simple, a considerable number, both of surveyors and inspectors of nuisances, were unable to answer them correctly. He believed it would be of the highest importance to the well-being of the community that the surveyors of towns should, prior to appointment, be proved to have a sound knowledge of sanitary subjects. By this he did not mean to say that the Sanitary Institute was the best examining body; the Institute had shown that a want existed which ought to be supplied, but the proper bodies to give diplomas in sanitary science were the Universities. Something had been said about lady examiners, and he would observe, parenthetically, that the Institute did not admit ladies as its Fellows, and that some pains had been taken in the selection of members of the examining body.

The President in replying upon the discussion, said while they differed as to the desirability of examinations for surveyors, all but the last speaker were in accord with his views. A very strong point in Captain Galton's defence was that many of the candidates were unable to answer the questions put, simple as they had been said to be. It would have been interesting to know what the questions were, and he suspected that most of the candidates were surveyors from small districts; as the better class of men would probably decline to submit to a voluntary examination.

JUNCTION BLOCKS IN PIPE SEWERS.

The following paper by Mr. James Craggs was then read:—In the course of the professional experience of the author, he has observed that stoppages in drains are in a great measure due to refuse, such as sticks and rags, which finds its way into the sewers and collects about the imperfect joints. A large portion of this refuse is admitted by the manholes and ventilators, and the object of this paper is to bring before the notice of this Association a junction block which has been designed by the author with a view of making a more perfect joint than is usually made with ordinary pipes built into the manhole as at present, with a less amount of labour. These blocks are of two classes, one being formed with a socket for the reception of the pipe, and the other with a neck of the size of the pipe to which they are to be connected. The blocks are likewise fitted with stoppers or valves, which can be opened or shut by means of an iron rod passing up the manhole or ventilator, so that the sewage can be shut off from the sewers when it is desired to effect repairs; and also, if all the valves be shut, the manhole may be charged with water, either from a gauge van or from the water mains, and so any or all of the sewers may be flushed without difficulty. These blocks are only suitable for small towns, and, so far, the valves do not work perfectly watertight; but the leakage is small, and he hopes to be able at no very distant date to get over this difficulty, and render them perfectly tight. A large number of these blocks have been used in the sewerage system of Shildon and East Thickley, which has been designed by the author. The cost is not great, as will be seen by the following prices, which include hard wood stopper and delivery on the site of the works at Old Shildon:—6in. block, 2s. 6d.; 9in., 3s. 9d.; 12in., 6s. 3d.; 15in., 7s. 9d.; 18in., 9s. 6d. each. Iron stoppers may be adopted in some instances, but the author considers those constructed in wood to be preferable, as they are not so heavy, and consequently may be moved from place to place with greater facility. In building the blocks into the manholes, it has always been the practice of the author to place the outlet block 2 or 3in. above the bottom of the manhole, which his experience leads him to construct with flat bottoms in place of the usual invert. Any refuse will be deposited then in the bottom of the manhole, and so can be removed at pleasure. The Weardale Coal and Iron Company have manufactured blocks of the description now under consideration at their works at Tudhoe, Spennymoor, in the county of Durham, from 6 to 18in., and that firm is duly prepared to supply them up to 30in., free from kiln cracks and all other defects, and salt-glazed inside and out.—Owing to unfortunate delay in transit, the blocks described in the paper did not arrive in time for exhibition at the meeting, and could not therefore be discussed.

THE SEWERING OF CROYDON RURAL DISTRICT.

Mr. W. Santo Crimp, resident engineer upon the sewerage works now being carried out from the plans of Mr. Baldwin Latham, C.E., in the parishes of Beddington, Merton, Mitcham, and Morden, and the hamlet of Wallington, for the

Croydon Rural Sanitary Authority, read a paper descriptive of the undertaking, which we shall reproduce in extenso in an early issue. The system adopted is that of water-carriage, and the rainfall is conveyed by the existing sewers to the natural watercourses. More than thirty-six miles of new brick and concrete and pipe sewers are being laid in the district, and in all but a very small portion of Merton and Morden the sewage will flow on to the filtration area adjoining the River Wandle, on the borders of Merton and South Wimbledon districts. The remaining districts will be served by a low-level sewer and outfall, from whence the sewage is pursued to the gravitation outfall. Great care is taken by the use of gasket, and Portland cement having a tensile strength of 350lb. per inch, after seven days' immersion, to make the sewers perfectly water-tight. Circular manholes are constructed at all intersections of streets, and at each junction of branch and main sewers, these as well as the ventilating shafts being furnished with Latham's spiral ventilator. The whole of the sewage will be filtered through coke and then conveyed into the intermittent filtration area, where it will be passed through the ground from subsoil drains and the purified effluent will evnteually fall into the Wandle. The area, of some 28 acres, has been surrounded by a 2ft. puddle wall, so as to prevent the passage of water from the surrounding water-logged area and the River Wandle into the filtration ground. The contract for the works is being carried out by Messrs. B. Cooke and Co., of Phœnix Wharf, Battersea, who took the work at £74,708,—not the lowest tender received by the sanitary authority.

Mr. Smith, of Chiswick, asked as to the head of water in the subsoil, and as to whether the gasket and concrete rendered the sewers perfectly water-tight.

Mr. Baldwin Latham, replying, said that the importance of making sewers impervious, so as to prevent fouling the subsoil waters, had only recently been understood by sanitary engineers. Whether the precautions proposed by the surveyor to prevent leakage were carried out or not depended largely on the workmen, and he was glad to bear testimony to the faithful manner in which Messrs. Cooke were fulfilling their engagement. To check the men they had three inspectors at work, as well as a resident engineer, and daily reports and tests were carefully recorded of the progress of the works, the amount of leakage, the height of subsoil water, &c. Beside this, care was taken to specify good material, and all pipes irregular in shape and thickness were rejected. As a result of these precautions, nothing more than a sweating of the joints could be detected anywhere in the main sewers, although the subsoil water was from 10ft. to 12ft. above the sewers in many places; indeed, the tests showed a small but steady diminution of leakage as the works progressed. Replying to further questions, he explained in detail the system. He did not propose to treat the sewage with chemicals, although provision was made for it should the authority at any time wish to adopt it. He had found that all chemicals "pickled" the sewage, so as to delay, or even prevent, its being taken up by the soil and oxidised. The unfortunate part of the problem was the sludge, which would neither drain nor dry. He, therefore, should turn this into subsiding tanks, where it would be treated with lime so as to destroy its offensive mucous property. By a pneumatic process the material would then be drawn up in an exhaust pump, and passed through presses in which it would be made into solid cakes, which would successively drop out and be removed—for sale, if possible. The aim of the sanitary authority was not to make a profit, but to dispose of sewage without nuisance, so that he was not hampered in his scheme by an endeavour to sell their waste products. The filtration area having been first well drained and walled in with puddling, the surface would be excavated and porous pipes laid for the distribution of the sewage, those being afterwards covered in with burnt ballast and earth. Practical experience had taught him that if sewage was not seen no one was offended by it, suggesting that the objection to sewage works was chiefly sentimental. After the organic matter had been burnt up, as it were, by the land, the effluent would pass into the old channel of the Wandle. As to cost, he assumed that the sewage rate upon the whole district would be 15d. in the pound. Strong pressure had been brought to bear upon their authority to join the West Kent sewage scheme, when, to the whole cost of sewers, as at present, would have been added the expense of pumping, and a proportionate share of the West Kent main drainage rate, for which authority had been obtained to levy up to 2s. 9d. in the pound. The very fact that he proposed to get his flushing water from the subsoil showed the principle of impervious sewers upon which he was working.

Dr. Jacob, M. O. H., regretted that no effort had been made to lower the subsoil water in a district which was admittedly almost waterlogged. In every case where this had been done the health of the locality had been improved, a fact borne out by the mortality returns. Doubtless, porous sewers were a mistake, but could not open-jointed drains have been laid in the same trench beneath the sewers?

Mr. Latham replied that wherever the plan suggested had been tried, the result had been destruction of the sewer by undermining, and consequent loss of support. In some localities drains might with advantage be laid above the sewers, but here there were exceptional difficulties. To begin with, the upper stratum of the district was a very pervious gravel, so that subterranean rivers would have to have been provided, and trouble might have arisen with the owners of the six-and thirty mills situated on the Wandle. Farther than that, owing to the natural inclination of the ground towards the river, there was a steady movement in the subsoil water, which was, in his opinion, rather advantageous than not. It was not the subsoil water itself, but the fluctuations in level, which were injurious, and induced typhoid, and here the flow was almost constant. In reply to Mr. Buckley Mr. Latham said the porous pipes in the filtration area were, perhaps, too low to be of much good to the crops, but their aim was to oxidise organic matters without nuisance, and not to farm land to profit.

NOTES ON IRONWORK.

Mr. Graham Smith, the secretary, read the following paper, under this title:

The branch of science which enables the engineer to determine the theoretical amount of strain in the members of any proposed structure may be said to appeal directly to ordinary intelligence, and to be on the whole simple. The science, however, depends upon data and conditions, the exact influence of which can never be determined in actual practice. It is proposed, therefore, in this paper to consider briefly some of the practical questions which affect theoretical deductions, and the design, efficiency, and economy of ironwork structures generally. The precise conditions under which ironwork will be constructed and worked being indeterminable, it becomes necessary, among other matters, to have some knowledge of workshop practice and routine in order to determine the proper limits and importance to assign to theoretical results. In taking out strains, it is usually assumed that each member has a normal length, whatever the amount of strain to which it is subjected, and that its conditions are the same as they would be were it free to turn in a plane about its extremities. Both of these assumptions are, to a certain extent, erroneous. So far from any bar having a normal length, that is being perfectly rigid, it may be taken for granted that directly any piece of iron is subjected to a tensile or compressive strain its length is varied accordingly. Likewise, no member of any structure is perfectly free to turn in a plane about its extremities; were it so, each junction would have to be made with an absolutely frictionless pin. In English practice junctions are frequently made with innumerable small rivets, which render them, to all intents and purposes, rigid. In America, however, pin connections are employed to a very large extent, and undoubtedly with pins and eyes properly proportioned efficient joints may be made, and with simple arrangement of parts theory be more closely approached than with our complicated systems with riveted joints. Variations in the temperature of the atmosphere likewise materially affect the strains in iron structures. When constructing an iron bridge a camber is given to it, so that when loaded it may assume a straight line instead of exhibiting signs of apparent weakness by sagging. While testing the bridge it is usual to measure the camber as the load is put on, and it is not uncommon to find that on a warm day the camber is greater than it was the evening before, notwithstanding that a larger amount of load has been put upon it. This anomaly is due simply to the sun warming up the top flanges, and causing them to extend, whilst the bottom flanges have not extended to a similar extent owing to being protected from the sun by a platform or the load upon the bridge. It has been ascertained that a variation of temperature in iron of 15° Fahr. will produce the same effect as one ton actual load per square inch; therefore a change of 82·5° Fahr. will produce the same effect as 5·5 tons per square inch actual load, which is greater than the amount of strain supposed to be put upon any bar when under its full working load. Now, although the difference between the extremes of temperature in this country may be estimated at 82·5° Fahr., the extreme temperatures only act during a short portion of each twenty-four hours, and so, owing to the mass of iron and other circumstances, the temperature of the structure is seldom the same as that of the atmosphere, consequently the iron is not affected to the full extent just mentioned. There are, of course, many positions which will at once suggest themselves where the temperature is tolerably uniform throughout the year, and where accordingly no provision need be made for expansion and contraction due to changes of temperature. In exposed positions in this country an allowance of 7-16ths of an inch in each 100ft. should be made if it is wished to eliminate strains which it has been shown may be of considerable amount. Edwin Clark has placed it on record that half an hour's sunshine has more effect on the tubes of the Britannia Bridge than the heaviest rolling loads or the most violent storms. Questions of the foregoing nature having been considered, and the strains upon the various members of the proposed structure having been determined within reasonable limits, it becomes necessary to arrange the material to meet them. It is in doing this properly and economically that the art of designing ironwork consists. In all designs every endeavour should be made to employ iron of such dimensions and weights that it may be easily procured in the open market, and require only such workmanship as can be cheaply and readily performed. By attention to these points economy will be more surely attained than by the saving in the weight of iron which may be effected by adhering more closely to theoretical refinements. As an instance of this it may be stated that the actual weight of a plate girder is always very much in excess of its theoretical weight, and it is rarely the lightest form of girder which it is possible to design to carry a load; it is yet generally the most economical type to adopt for small spans, owing to the uniformity of its parts and the simplicity of its manufacture. While mentioning plate girders it may be well to state that although the theoretical economical depth of all girders depends upon their description, the loads to be carried, and a variety of other circumstances, the depth of a plate girder is often fixed by one consideration alone, and that of a practical nature quite beyond the control of the designer. It is simply the fact that plates cannot be rolled at ordinary rates over 4ft. 6in. in width, so that the maximum depth of ordinary plate girders is fixed at 4ft. 6in. If this depth is exceeded it becomes necessary to plate the web vertically, which will enhance the cost of the work to an extent exceeding the saving likely to result from conforming more nearly to any greater depth which theory might dictate. In arranging the flanges, although theoretically the section of metal should be reduced at certain points, it is generally desirable when a limited number of girders are to be made from one design to keep the plates as nearly uniform in thickness as possible, rather than to vary their thickness so as to approach more closely to the amount of metal required to meet the strain. However, when a large number of girders are to be constructed from the same design, the plates may be varied in thickness without increasing in any way the cost of the work, as the plates can be ordered in batches from the rolling mills and relegated to their respective girders in the manufacturer's yards. At one time much of the iron employed for girder and bridge-building came from Staffordshire; consequently specifications were prepared in such a manner that iron from this district might comply with their stipulations. These specifications have been copied and re-copied even up to the present time, notwithstanding that Staffordshire iron is now rarely put into ordinary ironwork, for the reason that the sizes of the iron supplied from this district are small when compared with those from the north country. This is owing to the Staffordshire mills working with plant which was put down many years since, whilst the ironworks in the Cleveland district are provided with more modern machinery and improved appliances. A South Staffordshire plate to cost the ordinary market rate must not be over 4 cwt. in weight, 15ft. in length, and 4ft. in breadth, and about 30 superficial feet in area; whereas Cleveland plates can be procured without additional cost up to 21ft. in length, 4ft. 6in. in width, and 12 cwt. in weight, providing the area does not exceed 56 superficial feet. Although plates from the latter district may be obtained possessing as great a tensile strength both with and across the fibre as those from Staffordshire, they are not as a rule equal to the latter in toughness. Extra care should therefore be taken to test and thoroughly ascertain the quality of the iron, as it is sometimes very brittle; no attention whatever should be paid to "brand," as it is no criterion by which to judge of the qualities of iron usually employed for the construction of ordinary ironwork. A very fair specification for girder iron is 20 tons per square inch and 6 per cent. elongation with the fibre; 18 tons per square inch and 3 per cent. elongation across the fibre for plates; 22 tons per square inch and 9 per cent. elongation for L's and T's; and 24 tons per square inch and 15 per cent. elongation for rods and bars. These elongations ought to be taken on a testing section of uniform width for a length of $6\frac{1}{4}$in. In a length of $6\frac{1}{4}$in. there are one hundred sixteenths of an inch, so that each 1-16th elongation after testing represents 1 per cent. In preparing all samples for testing they should be drilled out of the plate angle or bar, and be either chipped or slotted to the required dimensions, and all tool marks carefully filed out, and the parallel portions should run in with curves of large radii to the portions through which the pin holes are drilled. In the event of there being the slightest shoulder at either of these points, it will have the same effect as a nick in the iron, which will generally render worthless the test for both tensile strength and elongation. With a little experience the quality of a plate may be determined to some extent by breaking the corner off over an anvil, and by inspecting the punchings from the plates. If the iron is brittle and untrustworthy, the punchings will show cracks in all directions if the punch be working as ordinarily with a little clearance, whereas if the iron is good and reliable slight cracks only will be perceptible, all running in the direction of the fibre. Whilst these workshop tests can be carried out in the manufacturer's yard by the inspector during the progress of the work, all tests requiring to be made with hydraulic presses or steel-yards should be conducted by independent authorities, such as Mr. Kirkaldy. After the material has been tested and passed and the structure put together, it becomes necessary to apply a proof load, which consists of gradually placing on the structure a weight somewhat exceeding its working load. This is requisite in order to ascertain if the workmanship is up to the proper standard. It must, however, be always remembered that a proof load is no test of the strength of the structure or the quality of the material. If the iron is hard and brittle it will give less than a material of more desirable quality, and the structure will apparently be stronger. Again any part may be on the point of breaking, and yet not yield sufficiently to materially alter the deflection. Likewise, although a structure may stand the application of a proof load at the time of testing, it does not follow that it will stand repeated applications of loads of even less amount than the proof load. Fairbairn's experiments carried out many years back demonstrated this fact. He found that when the strain on the iron of a beam was between 6 and 7 tons per square inch, the beam sustained an unlimited number of applications of the load producing this strain; but when the load was increased so as to put a strain of from 8 to 9 tons per square inch on the iron, the beam failed with a comparatively few applications of the load.

At the close of the proceedings the members partook of luncheon at the invitation of the contractors, and afterwards inspected the buildings and machinery, filtration area, the diversion of the Graveney stream to prevent flooding of the area and surrounding houses in Merton and Tooting, now being carried on as "extra" by the contractors, and some of the sewers in Merton and Mitcham.

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THE ARCHITECTURAL ASSOCIATION'S CONVERSAZIONE.

THE opening *conversazione* of the Association's session took place on Friday evening, at the Conduit-street rooms. Two or three circumstances militated against its complete success, the chief drawback being the very popularity of the assembly, the numbers of ladies and gentlemen present rendering locomotion in the galleries a toil, and severely testing the new ventilating apparatus in the Institute meeting-room; a second was the headache-provoking flickering of the gaslights in the latter room during the unusually long time occupied in the delivery of addresses. We are reluctant to reiterate the complaints as to the cloak-room and refreshment arrangements; but, owing to the unwontedly large attendance, they seemed worse than ever.

The premiated drawings hung on the walls of the Institute room are described on page 699 of this issue, and on page 706 we have noticed the pictures and needlework exhibition of the Institute of Art, which, while preoccupying the walls of the galleries, formed additional topics for small-talk. In the limited space remaining in the north-east gallery were shown some water-colour drawing from St. Pol de Léon and other towns of Brittany, by Mr. Phené Spiers, and executed with his usual vividness of colour, harmony of tone, and delicacy of handling. We also noted pen-and-ink drawings of the west entrance, Tintern Abbey, and the gateway, Oxburgh Hall, Norfolk, by Mr. W. J. N. Millard, clear and firm in their lines; pencil-sketches, artistic but hazy, by Mr. C. H. Löhr, of the south-west flank of the front of St. Wolfran, as seen from the lower end of the narrow street in Abbeville, and of St. Laurent, Rouen; the framed copies of Andrea Mantegna's designs for cartoons representing the triumphs of Julius Cæsar, recently presented to the Association by Mr. E. W. Godwin; "Ecce Homo!" a finely-conceived original study for an altar-piece at Castle Howard, the work of Mr. W. H. Hughes, an attempt that illustrates anew the impossibility of adequately depicting the expression on the thorn-crowned countenance of the Divine Captive; some illustrations of polychromatic wall decorations, from houses at Pompeii excavated during the present year, the details drawn full-size, by Mr. Sydney Vacher, amongst the subjects being Ceres, Venus, a pair of dolphins driven in harness by a sea-bird, and flower studies; and paintings on porcelain and red pottery ware.

At 9 p.m. Mr. S. F. Clarkson, as President, took the chair in the Institute room, and commenced the

DISTRIBUTION OF PRIZES

to those who have distinguished themselves in the classes during the session. The first on the list was a novelty, being a silver medal which had been awarded, together with five guineas, to H. W. Moore, for a Design for an Hotel in a country town; a special and second prize in the same competition, of two guineas, fell to F. Hemings, the judges considering that originality and skill were displayed in his elevations. In the next competition, that for Measured Drawings, no one of the three sets was deemed worthy of the first prize; but a second, "for considerable skill and industry," was given to Leonard Stokes, for drawings of Pershore Abbey. For the Essay Prize nothing of sufficient merit for the first place was submitted, but one-third of the prize was awarded to W. J. Burrows. In the Class of Design, the prize-winner, John Bilson, who also took that in the Class of Construction, was, he said, one of the most promising and hard-working members; the second fell to G. H. Smith. Of the twelve other competitors, H. H. McConnal, of Walsall, and A. Bridges were those who received honourable mention. In the Elementary Class of Design, J. H. Currey took the first prize, and C. C. Wilson the second, while A. S. Gover received honourable mention. The prize in the Colour Decoration Class went to L. A. Shuffrey—not the first he had taken; in the Class of Construction, John Bilson took the first and A. T. Ellison the second, D. R. McBlain receiving honourable mention. Amongst the letters of apology received (which included communications received from Mr. Whichcord, P.R.I.B.A., and Professor Hayter Lewis, who were prevented from attending by indisposition), the President said he would only read one, that from Mr. George Godwin, who remarked that many years ago the Association would have ceased to exist but for the interference of Professor Kerr and himself, and added that he would communicate further with the secretary as to a few books—between twenty and thirty volumes—which would probably be more useful at the Association than on his shelves. He then delivered the

PRESIDENTIAL ADDRESS.

Having welcomed the guests of the evening, the President said,—I will consider, in a few words, what architecture has been, is, and should be, and what the Association does for architects. How many or how few of the qualities found in good old buildings must reappear in a modern work in order that it may become a good piece of architecture? In it it must be evident that a man has been master of the work—not mastered by what he had to do; that he was able, more or less perfectly, to do what he wished, and that he sought and found pleasure in those qualities which educated men in all ages have agreed to admire. From this starting-point our onward course leads to the grandest successes which humour, wit, and will have wrought in building—where the greatest powers have found full expression, and the world has therefore felt effects similar to those produced by the most beautiful, most grand, most majestic scenes in nature. When some admirable work has been defined, as fitted to its site and purpose as a whole and in every detail; of good materials skilfully put together, likely to endure for generations, each part good in itself and especially good in relation to the rest, and as having an expression in harmony with the purpose of the building—that purpose not without a distinction of its own; when every excellence has been found in some measure and pointed out, it is clear that little further, except superlatives, will be wanted for the most perfect work which was ever designed, and, in consequence of the pleasure it gave to its creator, gained the power of giving pleasure for ever to all the world. Something very different from this, however, would be needed in defining the character of the larger number of buildings erected in any civilised country. Rough serviceableness would indeed be too lavish a phrase in England, where, as in all imperfectly settled countries, generally a handsome majority of the people are content to pass their days sheltered by ugly screens and coverings, which are neither wind nor water-tight, and will fall to pieces in one or two generations. But serviceableness itself, though not unimportant, becomes a small matter in our eyes when a good deal more seems easy of attainment. Sometimes the fine ease of thorough mastery beguiles a spectator into the belief that ease implies absence of effort. He tries his 'prentice hand, and lets everybody see the woeful contrast between hope and act. A lover of commonplace or of mild jesting might state his conviction that it is unnecessary to always begin at the beginning, and to learn by sad experience what can be taught in a much less unpleasant way to the performer and to the world. He might add, that the man who burdens the earth with an ugly, dull, or commonplace building can sometimes forgive himself, sometimes succeed in deprecating his own thorough self-condemnation, and sometimes be content to groan as he gives way to his fate, but the rest of the world need not feel very acutely any of his personal woes. An amateur practitioner is a gift of generous nature very embarrassing to the recipients. Probably his best efforts result in a rough appreciation of the bearings of things in general, and in bundles of defects of all degrees of magnitude, everything being made still more defective by jejuneness, by want of refinement, force, and definiteness. The moral of this is that architects should master their craft well enough to take a delight in it, and that no one who does not devote himself to its study and practice is likely to overcome the many obstacles besetting the path, or to acquire skill in walking along it. We believe it has always been necessary for a certain number of persons to give a good deal of their lives to the cultivation of their natural powers of design, and that no approach to perfection has ever been made except after long labour and training. We believe that in England the control of all buildings should be in the hands of trained persons who can and will direct it skilfully, carefully, and honourably. There is thus ample justification for the separate existence of our profession. We have thus prepared the way for saying that the Association gives a good help to students nowadays in reaching the inner meaning and fitting themselves for the effective practice of an art. No theory of design, however well learned, can give power, which must come from nature and be strengthened and developed by well-directed training. The Association gives the younger men in the profession the opportunity of learning from each other, and from older and more experienced men; while other of its advantages are, healthy emulation, many incentives to persistent work, and the chance of seeing one's work through other people's eyes.

Mr. F. C. Penrose, in proposing a vote of thanks to the President, spoke in high terms of the valuable educational work carried on by the Association, not only in its meetings and classes, but also in its excursions, and of the advantages it gave to young students.

Mr. Truefitt, as one of the oldest members of the Association, referred to the architectural exhibitions carried on about a quarter of a century since, and suggested their revival.

Mr. Millican, President of the Leicester Architectural Society, congratulated the members on the work carried on by the Association, and contrasted the present educational aids of the young architects in London with those he had when articled five and thirty years ago, in a country architect's office, where almost the only book was that by Peter Nicholson. The presence of the numerous bevy of ladies reminded him, that while the professions of law and physic had been invaded by the gentler sex, no attack on architecture had yet been even rumoured by the chief ornaments of the dwellings they inhabited. Having referred in amusing terms to the ignorance in legal minds of the real position of an architect, the speaker suggested that a brighter future was in store for architecture from the facilities now afforded to students, and added that he hoped on his return to infuse a little more enthusiasm into the rather languishing society to which he belonged.

Professor Kerr congratulated the President upon the present position of the Association, of the origin of which very many were perhaps unaware. In the year 1847 it was formed upon the ruins of a very small club of architectural draughtsmen. He himself was appointed to fill the chair for the first time, and but for the patronage of Professor Donaldson, then at the head of the profession, and the constant support of Mr. G. Godwin, he did not think it could have continued in being. This year a change had been made in the time for holding their conversazione, being after instead of before the opening meeting of the Institute, and he thought it a change for the better, as it afforded them in the President's address something to talk about and criticise. The Institute had just entered upon a new régime of Presidents, who were representative of the ordinary first class of architects. In former years, when Sir W. Tite and Sir Gilbert Scott occupied the chair, they were necessarily much restrained by reasons, which would occur to every one, from dealing with many practical subjects; but now they heard the opinions of the most intelligent of the whole profession delivered by one of themselves. Concurrently with an admission by the chairman of the Association's Class of Science that the progress was unsatisfactory, he noticed that Mr. Whichcord had expressed a desire that the papers to be read at the Institute should be upon practical subjects. When an architect was spoken of, what was primarily meant was a man who knew how to build as distinguished from one who knew how to design. But the profession of architecture combined the elements of the important and diverse subjects of art, science, and administration: its student should possess at once the artistic powers of a Royal Academician, the scientific skill of an engineer, and the administrative powers of the generality of business men. During the past ten or fifteen years English architects, in common with many other classes of men, had been extremely successful in the study of art. England had risen rapidly in the scale of art amongst the nations of the world, and her architecture now stood very high. Mr. Whichcord seemed to think that English architects ought now to be to some extent satisfied with art, and devote especial attention to science. There was no reason why the architect should not be as skilful a mathematician as the engineer—indeed, in that room that evening they had been addressed by one of the most distinguished mathematicians of the day, one who last year visited the Rocky Mountains to make a drawing of the corona of the sun. He would therefore impress on young architects not to allow the Class of Science again to be a comparative failure. Another subject of great importance to young men before him was that the time had now come when the examination test would be introduced into the profession as a preliminary to membership of the Institute. As it would be most unfortunate for an architect to find it difficult to obtain admission into the Institute, he urged young men to devote more time to the scientific branches of study. Another subject, the honour of the profession, was of interest alike to visitors and members. This had been impugned of late years, and it had been alleged that some architects had been guilty of dishonour in their fiduciary capacity. For himself, he would always say to a young architect, "You are entering a profession which more than any other is honest." Passing next to the question of quantities, Professor Kerr expressed his opinion that young architects ought to be allowed to take out their own quantities for the sake of the little emoluments which the practice involved, and because it excellently taught the arcana of the profession.

Mr. Charles Barry said that as to illicit commissions, he thought the time had come when it became the dignity of the profession to say no more on the subject. It was a bogie that had entirely disappeared. As to the proposed examinations at the Institute, he hoped the experiment would be tried fairly, honestly and thoroughly.

ARTISAN REPORTS ON THE PARIS EXHIBITION.*

(*Concluded from page* 610.)

THE reports upon ceramics occupy the foremost portion of the volume before us. Almost a third of the book is occupied with reports on pottery and glass, and the repetitions and prolixity, &c., to which we alluded in our first notice as imperfections in the editing of the reports, are most apparent in this division. Under slightly differing titles several writers describe the same productions from a nearly identical standpoint, the only variety being in the views expressed, and as most of the writers have chosen to describe the exhibits in detail, instead of summarising their criticisms upon the show as a whole, the reports are rather heavy reading.

The report placed first in the volume is that of Mr. Frank Harris, who takes the subject of "Pottery." Of Messrs. Minton and Co., the largest English exhibitors, he remarks that their collection was shown without confusion in an expressly-designed pavilion, the result being arrived at by having the articles arranged as they finally stood before leaving the manufactory. Amongst their works those executed by M. Solon, formerly of the Imperial Manufactory of Sèvres, were of the highest excellence. The encaustic tiles for wall and floor decorations, shown by Messrs. Minton, Hollins, & Co., are also spoken of in terms of commendation. The great charm of the Doulton ware is described as lying in their originality of design, gracefulness of forms, and harmony of colour, and in the diversity of the exhibits. Some of the stoneware shown by Messrs. Stiff and Sons was brilliant in colour and graceful in form. In referring to the exhibits of Messrs. Maw and Co., of Broseley, who closely competed with Minton and Hollins, regret is expressed that the names of the artists by whom the designs were executed were not furnished as well as the designers, for the success of the work was often due as much to the interpreter as to the original conceiver. The Campbell Brick and Tile Company had also a large display. The only competitor to be feared by England is, Mr. Harris thinks, France. The class of goods she excels in are decorated china, painted majolica, and terra-cotta. The production of vases at a lower price than English goods is due to several causes, the first being that articles are made in several small pieces, so that if a foot or cover be bad or injured, it can be replaced without much extra cost; for this reason decoration is more easy. In the higher-class articles English goods are far in advance; the under-glaze painting of the French lacks the firmness of our exhibits, the colours being apt to flow when the work is fired and glazed. Having described a visit to the National Manufactory at Sèvres, Mr. Harris explains that the workmen there employed are allowed to accept commissions from other firms. The system of training in French art-schools is different to our own. The pupil is instructed till the practical difficulties are overcome, when he is expected to apply his knowledge by executing certain specified drawings or paintings within a given time. The art-studentships are often given to those who may be proficient at the age of 18 or 19 in drawing, sometimes before they have settled what trade they will follow. They consequently acquire a miscellaneous art knowledge during years of scholarship, which they have afterwards to find out for themselves how to apply, and much of this knowledge acquired proves of no real use to them in their particular vocation.

A report upon "Pottery and Earthenware" is written by Mr. Aaron Green, and traverses much the same ground as that just referred to. The study of the Sèvres exhibits left, he says, a feeling of disappointment and regret that this establishment should, however slightly, have fallen from its old prominence at the van. It is still a mighty power, however; and it will cost Englishmen much earnest work, patient study, and improved knowledge to keep pace with Sèvres. It is not here, but in the exhibits of private French firms, that the best painting was to be found. The Austrian display contained much highly-finished subject-painting, and the fault was that it was overloaded with finish, producing a heavy appearance. The Japanese exhibits were humorous and of high value, the modelling being perfect, the mysteries of colour solved, and the technical difficulties cleverly overcome. Mr. Harris, like Mr. Green, speaks very highly of Messrs. Minton's display, speaking of it as incomparably the finest collection of art ceramics ever exhibited by any private firm in the world; but although the report is doubtless written in all honesty, the eulogy will perhaps be discounted when the reader finds, at the close of the report, that Mr. Green has been in the employ of this firm for the last 35 years. The ware shown by Messrs. Doulton receives high commendation, Mr. Tinworth's well-known "Football Players" group being praised for truth and vigour. Mr. Charles Tofts, in his report on "Pottery and Porcelain," speaks in favourable terms of the French fashion of building up large vases by means of bronze-gold fittings, which he says hide all imperfections in joining, and give a beautiful effect of ornament, and adds, "with a supply of French porcelain clay—of which we now know the secret—we should soon be able to show the world that we can manufacture large vases quite as well as the French." He mentions some tea-plates and trays, shown by M. Pouyat, in which perforations in the pieces had been afterwards filled in with a substance more transparent than the china body; the effect is said to be good, and he asks why some of our Staffordshire manufacturers do not make this kind of goods. He complains that the French terra-cotta shown was not sufficiently baked, from a dread of loss of colour, and that therefore the ware had only the consistency of figures done in plaster of Paris. At the close of his report Mr. Tofts draws attention to the important part which the potters play in the production of ware, and in complaining that this class of workmen are never acknowledged in Exhibition reports, asks if nothing is worthy of notice in ceramic products but the decoration? The subject of "China Painting" is taken up by Mr. J. Randall. Like most of the other reporters in this division, he describes a visit to the Sèvres manufactory, and states that an artist in that establishment has advantages over an English workman in the drawings, oil paintings, and other things on the walls, the shells, stuffed birds, and other natural objects on the tables, from which hints for designing decorations can be taken, as well as the Musée Ceramique in the manufactory, admirably arranged and classified, to go to for the refreshment of his mind and the enlargement of his ideas. The clearness and brightness of colour observed in the Sèvres porcelain painting and not to be obtained in English productions, is attributed by

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* The Society of Arts' Artisan Reports on the Paris Universal Exhibition of 1878. London: Sampson Low, Marston, Searle, and Rivington.

Mr. Randall to scrupulous cleanliness and the freedom from dust and sulphur caused by the use of wood in place of coal for the furnaces. A proof of the influence of the national manufactory is that the use of paste-upon-paste for decoration, originally shown in genre in Sèvres collection in 1867, is now common throughout France for the treatment of large pieces. French manufacturers have an advantage over those of England in that wherever there is distinguished talent in china painting, each manufacturer is enabled to share in it as though it were the property of the nation. In England a manufacturer employs his own artists on the premises, and will not allow anyone else to avail himself of his skill. In France each manufacturer who can pay the price can employ the highest talent the nation possesses and share in the knowledge obtained by chemical and other chemical investigations at Sèvres. In the English department the writer speaks of the great improvement in the style of porcelain decoration since the Exhibition of 1867. As the result of acquired artistic skill and increased aptitude for drawing, effects are attained with less labour than formerly, and greater breadth and freedom are discernible. Mr. George Bedford deals with "Terra-cotta" in three divisions, as pottery, statuary, and for architectural purposes. In pottery the collection shown by Madame Ipsen, of Copenhagen, was the finest in the Exhibition, and included some adaptations, in colour and gold, of Trojan forms from the Schliemann collection. All Madame Ipsen's decorations were drawn and painted by hand—the only method which ought to be adopted in examples of "art" pottery. The finish of the handle and spout—a point often neglected in terra-cotta—was well attended to in all Danish goods. The wages of Danish workmen are the same as are paid in England, but that of the thrower is much lower. The prices of smaller goods are higher than English ones, but the large vases are comparatively cheap. In the Italian section the exhibits were principally vases, but all were apparently literal copies of the antique, both in form and ornamentation. As the writer observes, something more than good copying is required in art pottery. Some Japanese vases suggested a mode of ornamentation well suited to a brittle material such as glazed terra-cotta. A deep groove might be turned in the body of the vase, and in this delicately-modelled ornament might be laid, so deep as just to restore the original profile, but well protected from injury. In the Indian and other Oriental pottery there was much that was good and original; but this was rather the effect and arrangement of the whole, which was suggestive, than the design or drawing of details. In the English section the only true exhibitors of true terra-cotta were the Torquay Terra-cotta Company, but their work was pictorial instead of decorative in treatment, and the material was sometimes completely hidden by enamel. In terra-cotta statuettes the French were far ahead of other nations, and Mr. Bedford assigns first place for novelty to M. Ladreyt, of Paris, for his polychromatic terra-cottas, chiefly humorous figures in old French costume. The figures were made from moulds, but so cleverly touched up afterwards as to be equal to models; the draperies were made either in separate moulds or modelled by the finisher out of separate sheets of clay, the latter method giving great freedom and lightness of effect. All sorts of mechanical devices were practised to give texture to the draperies and accessories, but were carefully concealed by after modelling. Many of the Italian statuettes were coloured, but the colours had not been fired, and would not stand much handling or cleaning. The weak points in English work were the finish, the details being either dull or too sharp, and the want of weight and thickness. In architectural terra-cotta England was inadequately represented, but those of Messrs. Doulton, in the reporter's opinion should be placed before those of any other nation, not only for durability and perfection, but also for novelty of effect and beauty of design. Terra-cotta statues of the highest class have been objected to as simply a substitute for marble. So they are, Mr. Bedford admits; but frequently it is a choice of a cheaper substitute or no statue. Especially is this the case on bridges and public buildings whose empty niches and pedestals require to be peopled by the imagination of spectators before justice can be done to the architect's design. In such cases cheap stone being excluded on account of non-durability, and marble for want of money, a terra-cotta statue, more durable than marble and as cheap as soft stone, appears to answer every requirement. The work should be specially designed for terra-cotta, and well supported by drapery or otherwise, so as to stand a hard fire without danger of distortion.

Mr. Joseph Leicester, under the title of "Table and Fancy Glass," describes the mode of manufacture of glass in France as seen at Clichy, which differs from that of this country in the employment of five or six boys, instead of one, to each man, and the long hours made, both tending to cheapen the cost of production. In the Exhibition he considers that the English manufacturers of flint glass were still in advance of other competitors; but they, especially those of France, are gradually closing up the gap, and would have come to the fore long since had they adopted free trade. Both in colour, type, and execution the French have been close imitators of British manufactures, but the latter shows greater advances in artistic variation. In the Venetian glass ware the blending of colours and freedom of form were remarkable; but the numerous prunts and pinchings and sharp projections rendered it difficult to cleanse and easily broken, and therefore unsuitable for domestic use. In the samples of glass engraving of all countries there was a remarkable sameness and use of classial subjects, the only exception being that afforded by Messrs. Powell's collection. "Stained and Coloured Glass" is reported upon by Mr. Francis Kirchhoff. The Exhibition display was, he says, a poor one, especially in the British section, in which the majority of the exhibits were by young and rising men. A chief reason for the falling off from the Philadelphia Exhibition was that while hundreds of orders were being executed for the United States by English firms, they had no expectation of obtaining orders either in France or Germany. Indeed if the British had been a fair standard of our ecclesiastical glass painting the demand for it in France would not be very extensive. Glass-painting may be divided into two classes. The ecclesiastical work requires artistic illustration of religious subjects skilfully rendered, with no single part glaringly conspicuous or offensively obtrusive, in either colour, depth of shadow, or contrast of light and shade. The ornaments should have a certain severity of design and an absence of any ridiculous or humorous suggestions. The other class, domestic work, for public halls, mansions, staircase windows, &c., may be designed and painted in every style, from Egyptian to Japanese. Imitation animals, natural or grotesque, plants, and flowers, conventional ornament as heavy in design as cast iron, or scrolls as fine as filagree work, historical scenes, heraldry, unnatural landscapes with impossible waterfalls, or a country scene worthy of Turner—all may be drawn for domestic work, according to the caprice or taste, whatever that may be, of the person for whom the commission is executed. All painted glass must be properly placed as to light; it will lose its beauty if a strong light is allowed to stream on to it from wide openings on opposite side of the building. In order to prevent too much light passing through the window and rendering it impossible to distinguish the designs, the custom has arisen of late years of plating windows so deluged with light, with a thick rolled glass on the outside, a little distance away from the painted work. Rolled glass diffuses the light, whereas ground glass would destroy all brilliancy. Mr. Kirchhoff describes the exhibits in detail, and mentions with approval that in the British church work there is a tendency to discard the severe imitation of 14th-century work in favour of more correct drawing and greater regard for colour. Although generally the French windows in the Exhibition were good in design and proportion, the colour was by no means of equal merit.

"Ornamental Ironwork" is reported upon by Mr. William Letheren. He considers that the English exhibits showed an amount of labour in execution to which the result was incommensurate; the most delicate and difficult work was a small wrought-iron panel, 3ft square, consisting of animals and small sprays of foliage, exhibited by Messrs. Hart, Son, and Peard. The French work was well proportioned and finished, but some of the examples which appeared to be wrought-iron proved to be of inferior metals. The largest show was that of Austria. After passing through the streets of Paris, examining the Exhibition, and visiting five of the workshops, Mr. Letheren noted that in all French work there is the same characteristic strong frame and thin *répoussé* foliage, which in a few years, without continual painting, must decay from the action of the atmosphere. There seems no progress, and everything is ornamented to excess. He considers that England has little to fear from France so long as wages are in fair proportion, for Englishmen will do more work than French operatives and we have better machinery. He asks the question why, with all the mechanical assistance now available, our art-metal work has retrograded since the days of Huntingdon Shaw? The pressure of competition has doubtless much to do with it; but another reason is that the vast majority of the men in our metal-workshops are ordinary mechanics: for the skilled artisan, however successful they are themselves, rarely bring up their sons to it to surpass them with the advantage of higher education, but train them to some calling more genteel than the blacksmith. Mr. Mark Rogers, junr., reports on "Carved Woodwork," and recommends English woodcarvers to go for examples more to the Italian and less to the French. In the carving from Italy, smoothness of surface is reserved for the figure, foliage, flowers, and ornament being treated so as to emphasise the tool-marks. In all the French wood-carving, of which the display was the largest ever brought together by one nation, figures and all else are finished with a monotonous smoothness, which evidences manual skill, but which destroys the charm of hand-labour. In the English work shown there was a pleasing variety which contrasted with the mechanical repetitions of parts of a design, seen in the Belgian and some other sections. Mr. Wm. H. Howard contributes a report on "Wood Carving." He regards the French, although very numerous, as not a good specimen of that nation's art workmanship, although many individual works were marked by rare excellence. The Italians are not, he says, equal to the French in ordinary decorative carving, but in representing nature and, notably children, they distance all competitors. When they descend to conventional ornament they are not so successful, and the scope of work is limited. A common fault in Italian Renaissance work is that the undercutting is carried so far that the semi-detached portion appears stuck on, and the carver's skill is thus lost sight of. The English exhibits were of considerable diversity, and showed no one prevailing style. He repudiates the notion that what our manufacturers sent to Paris is a fair sample of what English carvers are capable of producing. The French and Italians were content with a small space, but our manufacturers treated the Exhibition as a vast bazaar, and aimed at quantity rather than quality. The causes for the relative want of skill in English, as compared with Italian and French carvers, he believes to be, that art industry is not patronised by our wealthy men, so that good carvers leave the calling for more remunerative work, but chiefly that our facilities for studying are so restricted. In our schools of art we want, he says, to be instructed in the practical application of art to industry; to gain by teaching the technical knowledge and skill now only obtained by the slower process of daily experience. Mr. Henry Turner, in a report on "Stone Carving," says that the designing power of French carvers is obviously in advance of that of the English, the reasons being the advantage possessed by the Parisian workmen in the Municipal Art Schools, where education in art is obtainable without cost, and the system of piecework in the workshops, which affords a strong inducement to individual exertion and to superior acquirements.

CHIPS.

The organ of Tavistock parish-church was reopened on Thursday, the 5th inst., after enlargement and remodelling, carried out by Messrs. Walker and Sons.

Drainage works have just been carried out in the modern watering-place of Westward Ho! for the Northam Local Board. Mr. Ellis, C.E., was the engineer, and the cost has been under £700.

The Wesleyan Methodist chapel in the City-road, which was erected 100 years ago by John Wesley, has been devastated by fire. The Morning Chapel has been utterly destroyed, and the large building much burnt in the north gallery, the roof, and the interior, although the walls are still standing. The fire is supposed to have originated in the flues of the heating apparatus, and was first discovered by a policeman a little before 6 on Sunday morning last.

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ILLUSTRATIONS.

TWO RESIDENCES AT SEVENOAKS.—DESIGN FOR CLOCK AND HALL-TABLE.—COMPETITION DESIGNS FOR THE NEW HERNE-HILL MISSION CHURCH. — ANDERTON'S HOTEL, FLEET-STREET.

OUR LITHOGRAPHIC ILLUSTRATIONS.

RESIDENCES, SEVENOAKS, KENT.

The houses shown in our double-page illustration are both in close proximity to Sevenoaks town, and the celebrated Knowle Park. They stand on elevated sites and command beautiful views of this charming district. In the upper example the design is a combination of dark red brick walling, lighter red tile-hanging, and half timber work, while the roofs are of brown Broseley tiles. The accommodation provided, in addition to that shown on ground-plan, comprises a billiard room, 24ft. by 18ft., with octagon ends and angle balconies, 9 bed and dressing rooms (5 of which average over 20ft. by 16ft.), fitted bath-room, ladies' w.c., cellarage, &c. In the other house there are also 9 large bed and dressing-room, bath-room, ladies' w.c., &c., &c. In this house the external wall tiles are of a novel form and design, made expressly for this building. In both cases the external walls are built hollow and tied with iron binders. The window-sills are of brick and tile in cement. Special attention has been given to the efficient ventilation of the rooms and to sanitary matters generally. Serving hutches are fitted in the dining-rooms, by which means the inconvenience of constantly opening and shutting doors during meals is obviated. The architect is Mr. Edwin T. Hall, of 57, Moorgate-street, E.C., and the builders are Messrs. T. Ennor, Julian, & Co., of London.

"BUILDING NEWS" DESIGNING CLUB—A HALL-TABLE AND CLOCK-CASE.

To-day we publish the design, by "Honey Dew," for a hall-table and clock-case, which we have placed first in the competition. We also include in our illustration the design for a clock-case by "Binny," which in many respects is superior to that by "Honey Dew," whose placing was chiefly determined by his hall-table design.

HERNE HILL MISSION CHURCH COMPETITION.

The instructions issued to the six competitors required that the church should be so placed as to leave as much space as possible in the site for the future erection of a mission-room or school-room, and it was also laid down that no entrances to the church should abut directly on the road. These requirements, and the desire to place the church east and west, led to the arrangements shown. No sum was stated, and the estimated cost of this design was £2,900, when completed, to accommodate 400 persons. The materials proposed were red brick facings outside and stocks inside, with Bath-stone dressings sparingly used, with simple cusped heads and no tracery. An angle at the west end towards the road was intended to be occupied by a drinking-fountain. An attempt was made to give the building as much as possible the character of a small mission church.—Aston Webb.

This design has been studied with the view of providing, in the most economical manner consistent with the requirements of the Incorporated Church Building Society, for the number of sittings demanded. All attempts in planning to retain an eastern position of chancel on this site, requiring a form of structure expensive by reason of wide span roof and intersections; the church has been placed parallel to the longest side of the triangle, and is planned upon the simplest lines of nave, apsidal chancel, and single aisle under one roof. A wish to depart in some measure from the vernacular early pattern district church, has led the author to approach in the detail to the later, simpler, forms of Flemish work. The western gable is marked with ogee brick tracery, the windows generally being square headed with ogee moulding. The use of stone is nearly confined to the heads and sills of doorways. An estimate, carefully prepared by a surveyor of experience, placed the cost of the entire building at £2,350.—W. Penstone.

This church has been designed as a town church, and the aim has been to get effect by size and good proportion, that it may assert its position amidst the surrounding houses. Strict economy being ordered, simple lancet windows have been used, and character given to them by making them all with wide splays internally. The church was intended to be built of red brick, plain framed roof with principals, purlins and tie, beams, slate covering, oak shingled bell-turret, and simple stained deal fittings. A good space is arranged at the east end for coloured decorations, and any amount of richness and colour may be obtained on the roof, walls, and windows. The cost was estimated at £3,450, complete.—J. Edward K. Cutts.

A detailed description of the drawings will be found in the Building News for Friday, November 7th.

ANDERTON'S HOTEL, FLEET STREET.

This building, which we illustrate to-day, has been recently fully described in our pages. The architects are Messrs. Ford and Hesketh, of 21, Aldermanbury.

* * *

THE INSTITUTE OF ART, CONDUIT STREET.

We have pleasure in calling notice to the works by ladies contributed to this exhibition, to which we lately drew the attention of our readers. Considerable progress has been made in the character of the exhibits, and those ladies who have the taste or leisure to make art-work a profitable as well as an entertaining pastime, cannot do better than become members of the Institute of Art. Every kind of work is to be found in the exhibition in Conduit-street, from art needlework to painting in oils. In the former class we notice, since our last visit, four panels for a folding screen made of rich brown satinet, upon which are worked some beautifully-executed embroidered designs in foliage and birds. The lower part or border of screen is of black satin, embroidered with grass, flowers, &c. The work is by Miss Monies. While according full praise to the work, we cannot bestow the same admiration for the design, which is a trifle too imitative, while the colours are somewhat out of keeping for a screen. The work-tubs, exhibited by Mrs. Talbot Coke and Miss F. A. Brunton, are creditable, and the foliage on some of them is painted with much taste. We notice also a fancy-table by Mrs. Maclean, and one by Miss Beresford. Another design consists of sprays of wild honeysuckle, by Miss Beatrice Abbot, treated with considerable feeling in a Japanesque spirit. In designs for needlework honourable mention has been awarded to some door-panels by "Nora," in which foliage and flowers have been tastefully treated and beautifully worked. For china-painting, of which class many striking exhibits are to be seen, we observe the prize has been given to Miss A. Dunlop. We notice also a screen, exhibited by the Working Ladies' Guild, admirably worked in embroidery, and some painted cups by Miss O'Doherty. The painted tiles, illustrating Little Red Riding Hood, by Miss Harrow, are cleverly executed, and Mrs. Martyn's leather-work cabinet for china makes a pretty piece of furniture, the leaves and ornament being very skilfully modelled in the material. We have not space to mention other work in the many classes; the lace work and fancy carving, decorative painting on wood, china, and woven fabrics show undoubted ability, needing cultivation afforded only by the exhibitions of this kind. In the picture-gallery, we may mention, in addition to those works previously noticed in these pages, a cleverly-painted sea-piece, called the "Moon-lit Sea," by Miss Hortense Wood, a work displaying much skill and good handling in the reflection in the rippled waves, and especially in the broken clouds, behind which the moon is partly concealed. The painting by E. M. S. Scannell, showing a dark girl clad with bright yellow, with a broom in her hand, is in pleasing harmony of colour, and the expression on the girl's face is depicted with much feeling. Mr. Reynolds' "Sunflowers" is a vigorous bit of colouring. We also notice a few creditable works by E. Turck and H. S. Tatham; Miss Colson's "Fortune Teller," and Mrs. Gray's painting of head are both good, while E. Gill's river-scene we notice for the liquidity of the water.

* * *

THE EMPLOYMENT OF CEMENT CONCRETE FOR THE SOUTH PASS JETTIES.

Some time ago we referred to the construction of the above jetties, which have been erected to improve the navigation at the mouth of the Mississippi. The enormous lifting-power experienced at the sea ends of these jetties in time of gales led the engineers to rely upon a material more powerful than quarried stone. The smallest concrete blocks placed on the South Pass jetties weigh about 25 tons, and the largest 72 tons. The placing of these blocks has been dictated by the consideration that in parts exposed to the sea the weight of the material used in the formation of a slope should be equal to the force of the waves, and that the slope will be safe with the degree of obliquity due to the weight of material. We may remark that the concrete is composed of broken stone, gravel, sand, and cement; the stone is broken in irregular pieces by hand, and each stone had to pass through a ring 3in. in diameter. The sand comes from the islands in the Mississippi; it is rather coarse and sharp grained, of slightly yellow colour, the grains averaging about 1-40in. diameter. The percentage by volume of voids, and the weight per cubic foot of the stone, gravel, and sand were as follows:—

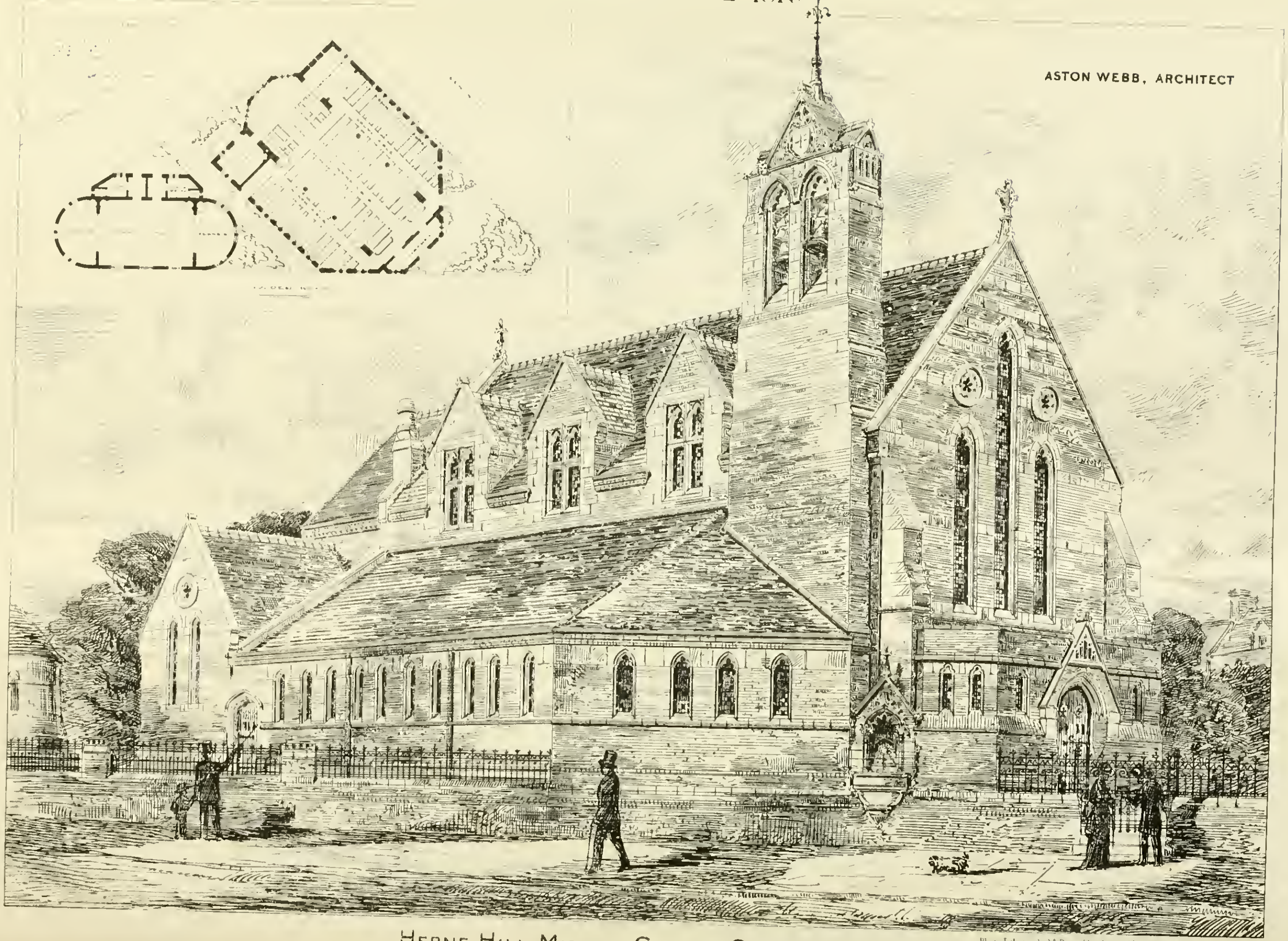
	Percentage by Vol. of Voids.	Weight per Cube Foot.
Broken stone	·489	79·50lb.
Clean gravel	·314	119·24
Sand	·333	79·72

The cement used is Saylor's American Portland cement. The testing is done on fineness, weight, and tensile strength, and for the latter purpose Riehle's counter-balance testing machine is employed. The briquettes have an area of 2¼in. square. The average result of seven days' test for tensile strength in pounds was 278 3-10lb. per square inch of neat cement; the percentage passing sieve of 2,500 meshes per inch is about 85, and the weight per struck bushel U.S. is 120·53lb. The cement is slow setting, and may be stirred and shifted moderately without losing its hydraulic properties. Among other peculiarities mentioned in Mr. Schmidt's paper, we find the market weight of a barrel of the cement is 380lb. or 133·33lb. per cubic foot, and the proportions of ingredients used as follows:—15 parts by volume of broken stone, 4·38 parts by volume of gravel, 8·28 parts of sand, and 3·0 parts of cement. The ingredients are mixed with fresh water in the proportion of about 10½ per cent. of the volume of dry material. It may be useful to mention that the net contents of one hundred cubic feet of set concrete may be calculated as follows:—Broken stone 80·75 cubic yards, clean gravel 23·58 yards, sand 44·57 cubic yards, cement 16·15 cubic yards, these quantities making 103·94 cubic yards of concrete

* * *

Owing to the frequent and disastrous falls of chalk in the undercliff slip known as the Warren, the South-Eastern Railway Company propose to construct a new line, further inland under the cliffs, from Folkestone to Dover, and to entirely abandon the present section.

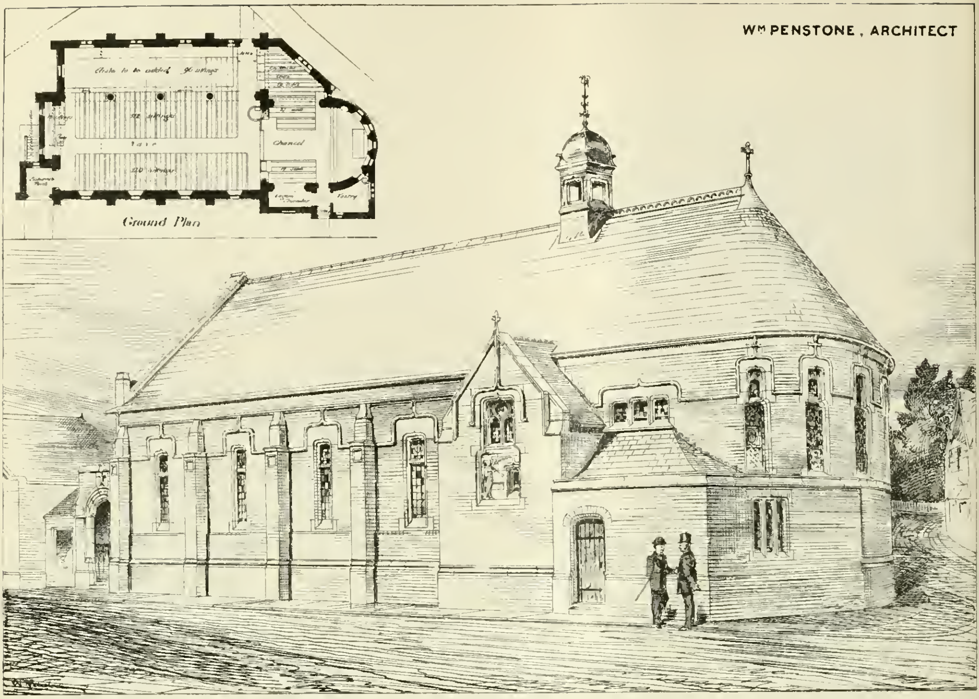
ASTON WEBB, ARCHITECT



HERNE HILL MISSION CHURCH COMPETITION

A SELECTION OF THE DESIGNS

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.


Wm PENSTONE, ARCHITECT

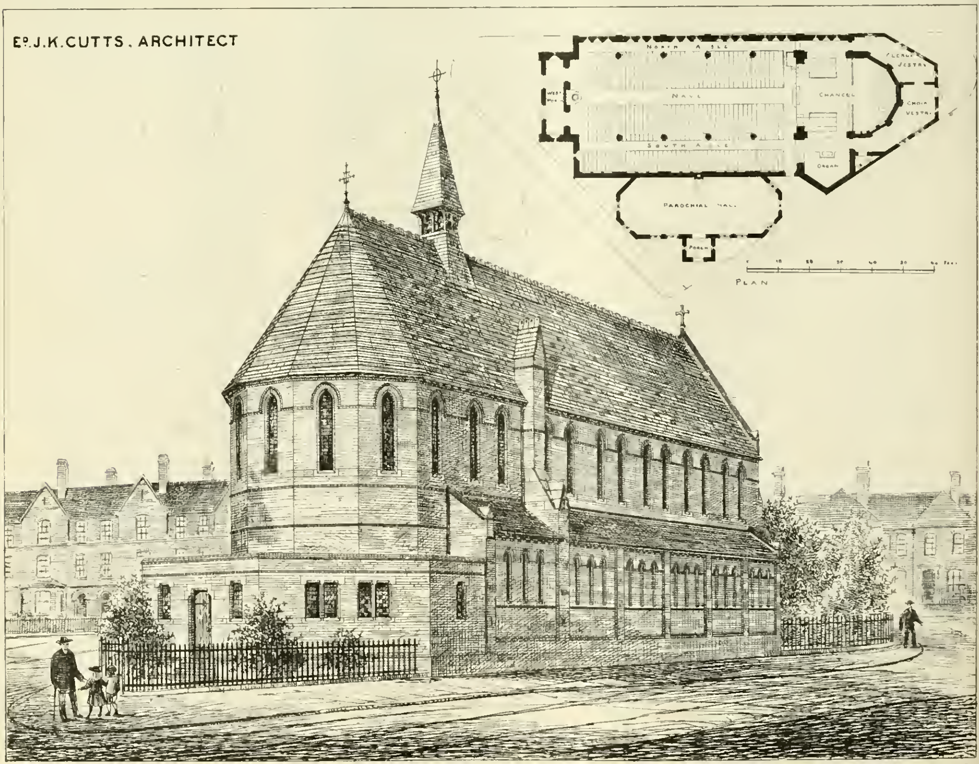
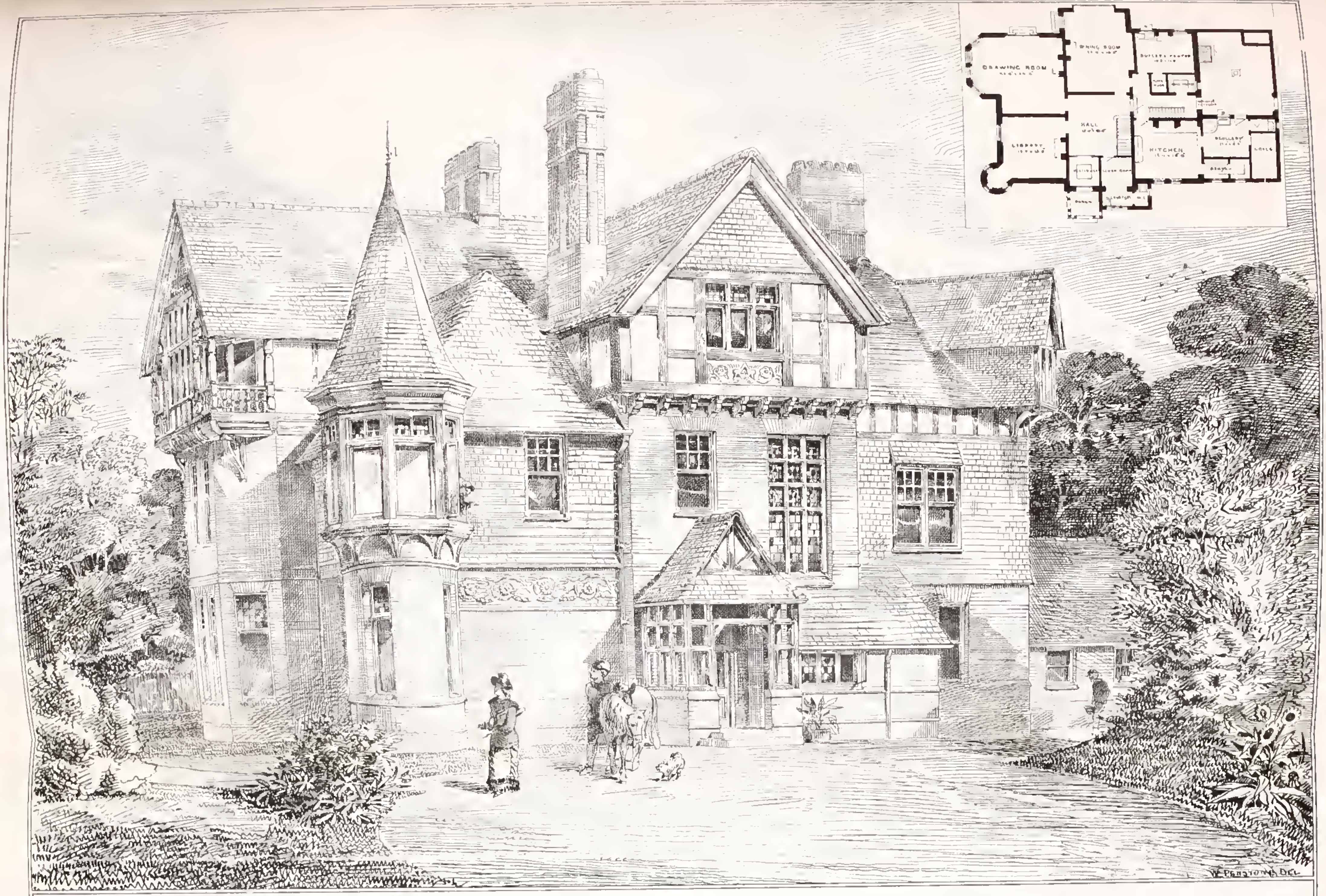

Ed. J. K. CUTTS, ARCHITECT

Photo-Lithographed & Printed by James Akerman, 6, Queen Squ

HERNE HILL MISSION CHURCH COMPETITION

A SELECTION OF THE DESIGNS



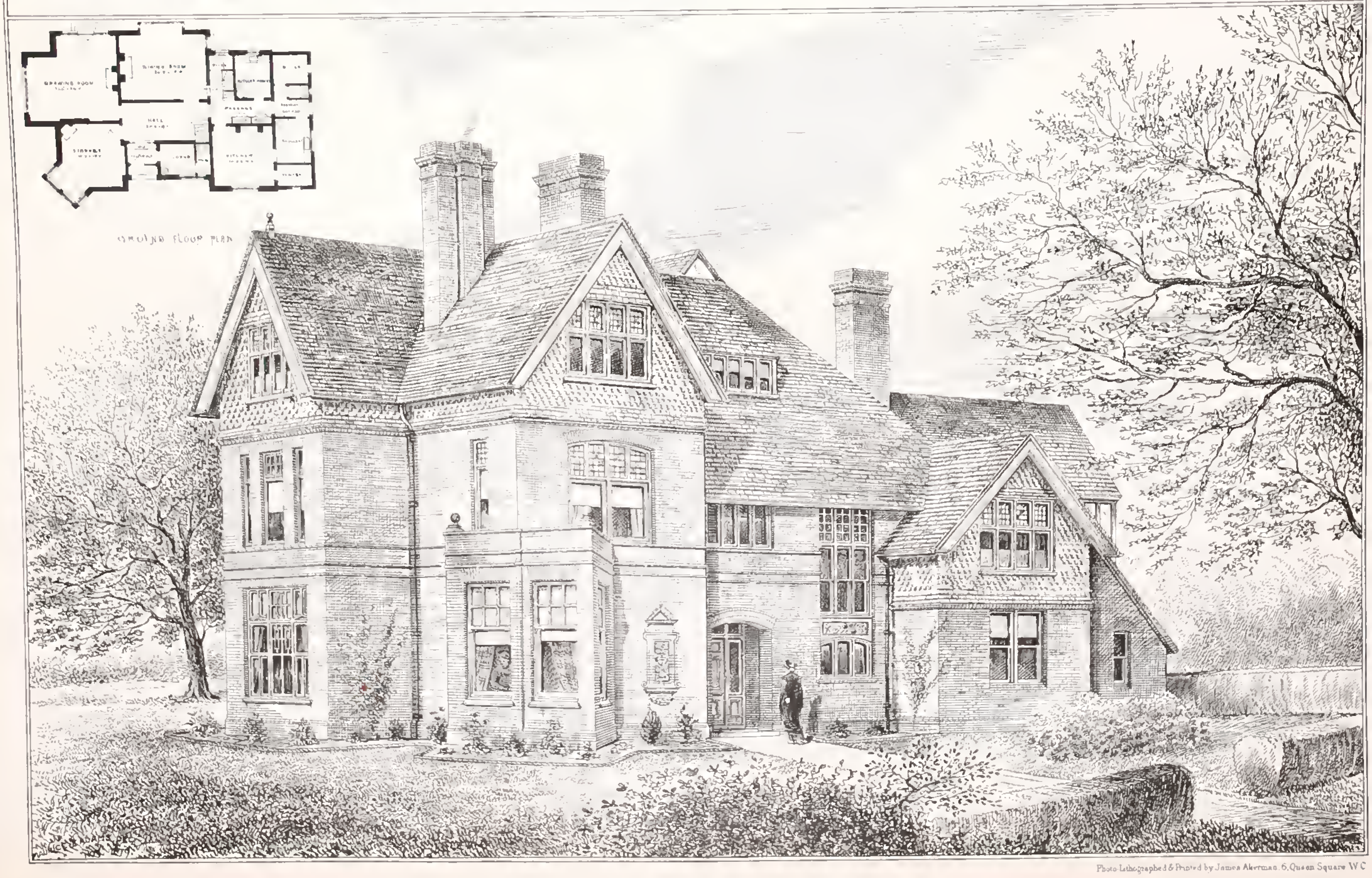
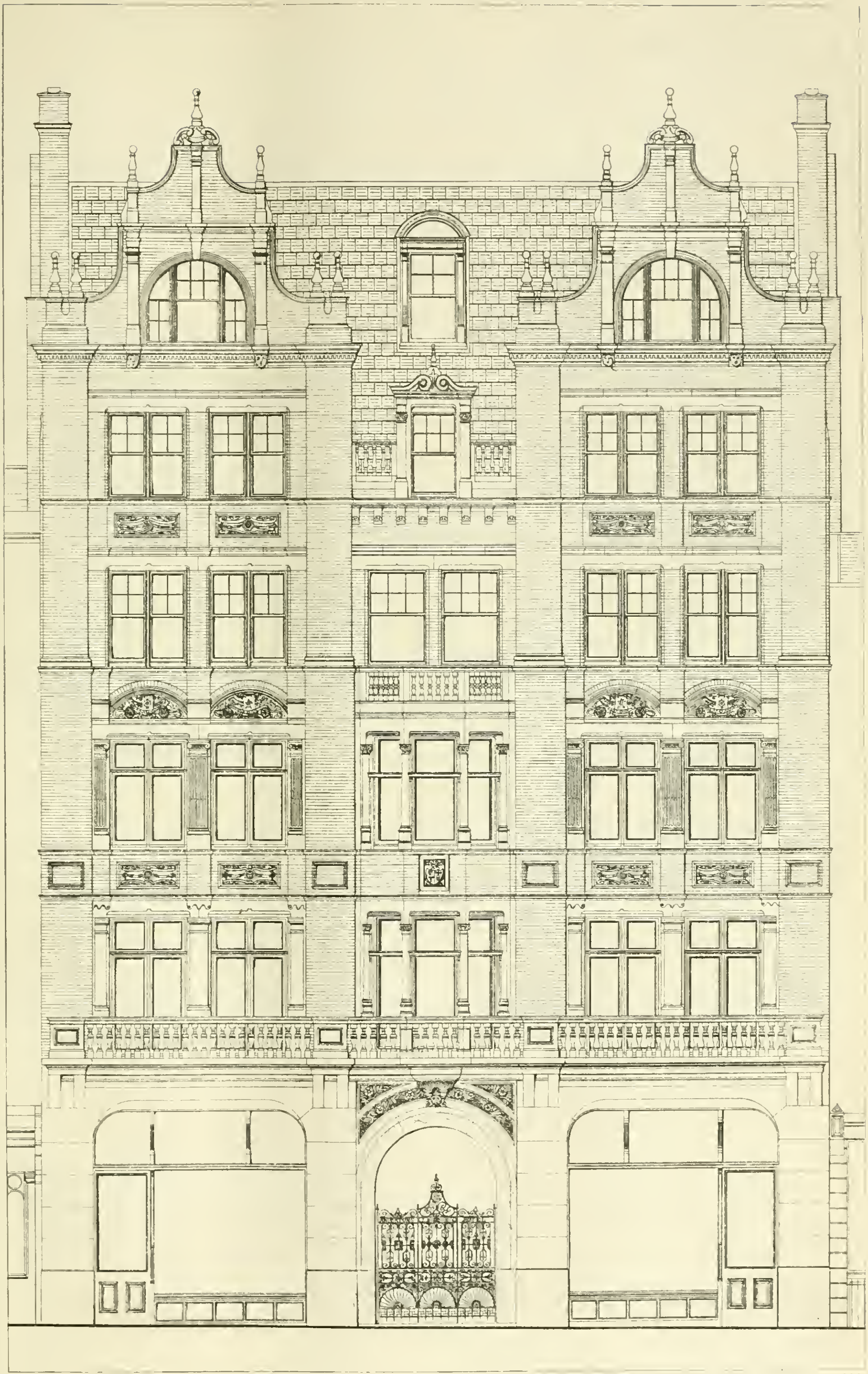


Photo-Lithographed & Printed by James Akerman. 6, Queen Square W C

Two Residences Sevenoaks Kent

EDWIN T. HALL ARCHT 57 MOORGATE S.T. LONDON

THE BUILDING NEWS, DEC. 12 1879



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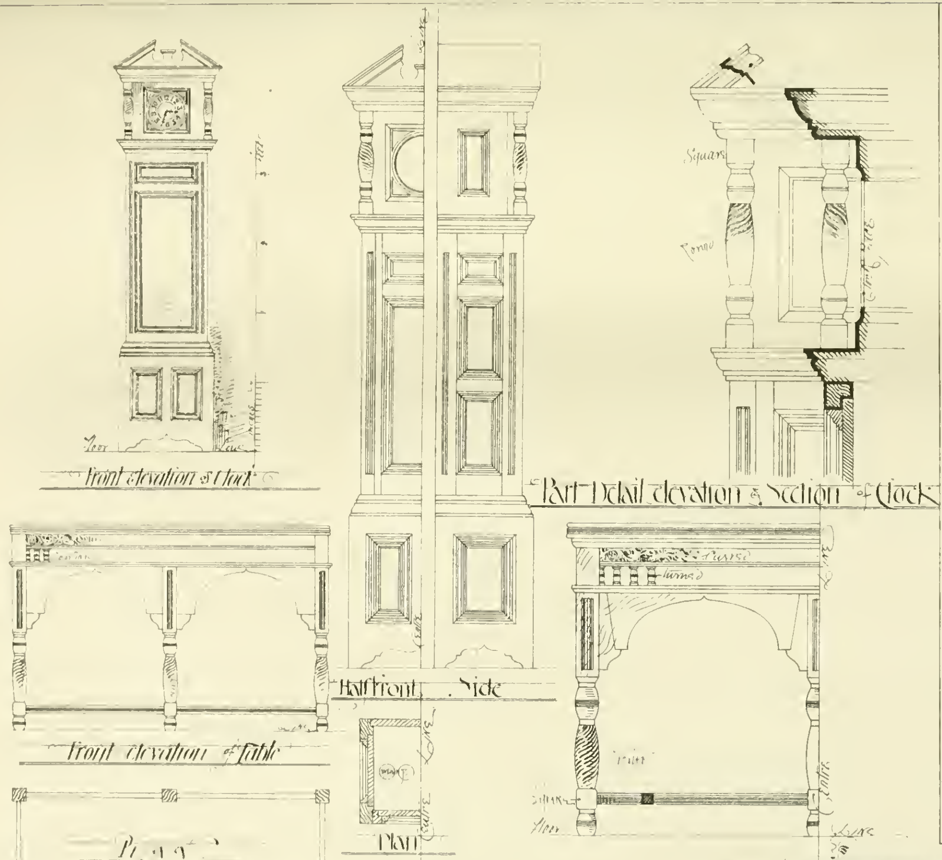
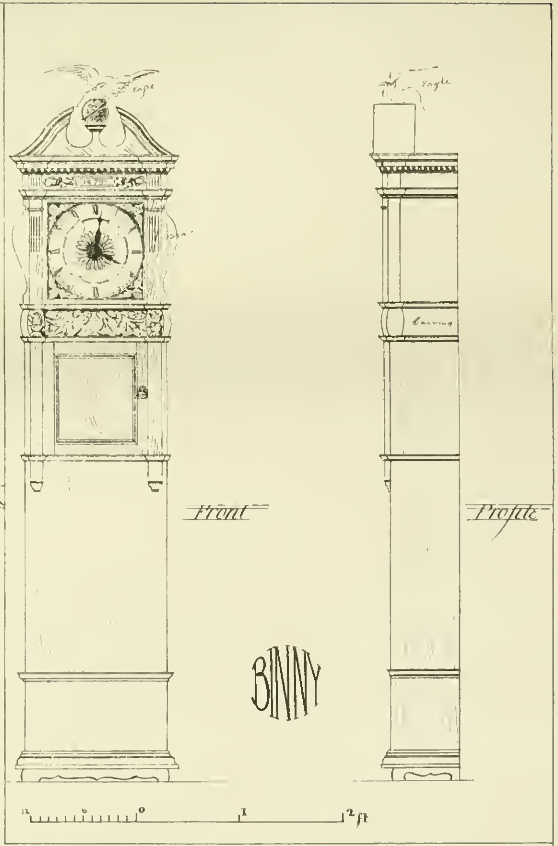
ANDERTON'S HOTEL FLEET STREET LONDON MESSRS FORD & HESKETH ARCHITECTS



"Honey Dew"

SELECTED DESIGN



Building News Designing Club.

Design for Clock and Hall Table

Photo-Lithographed & Printed by James Akerman, 6 Queen Square, W.C.

ROYAL ACADEMY MEDALS AND PRIZES.

THE medals and prizes annually awarded to the students of the Royal Academy of Arts were distributed on Wednesday night by the President, Sir Frederick Leighton.

Sir Frederick Leighton, in his address to the students said, on the threshold of those relations which his office established between them and which a deep and sympathetic interest in their artistic growth and welfare made especially weighty in his eyes, he was impelled to set aside, for once, at least, all purely practical and technical matters and to ask them rather to look with him for a moment into a wider and deeper question—that of the position of art in its relation to the world at large, in the present and in the past time, that they might gather, if possible, from this survey something of its prospects in the future. He wished in so doing to seek with them the solution of certain perplexities and doubts which would often in these days of restless self-questioning arise in the minds and weigh on the hearts of students who thought as well as worked. These perplexities, which few were fortunate enough wholly to escape, arose sooner in some and later in other organisations, and presented themselves only at a certain stage of advancement in the artist's mental development; for the gift of artistic production manifested itself in the young in an impulse so spontaneous and so imperative, and was in its origin so wholly emotional and independent of the action of the intellect, that it at first and for some time entirely absorbed their energies, the technical difficulties, only half-discerned, which lay before the student serving rather to whet his appetite than to hamper or discourage him, for his heart whispered that when he should have brushed them aside the road would be clear before him, and the utterance of what he felt stirring within him would be from thenceforward one long unchecked delight. This spirit of spontaneous unquestioning, rejoicing in production, which was still the privilege of youth, and which, even now, the very strong sometimes carried with them through their lives, was, indeed, when art herself was in her prime, the normal and constant condition of the artistic temper and shone out in all artistic work. Tracing the influence of this spirit, which gave a perennial freshness to Athenian art, in its manifestation in different ages and in various forms of art, he came to the questions—What was art in the world? Was it a lasting, living thing, or was it an ephemeral apparition? Had it still power of growth within it and capability of further expression, or had it reached already its full and final developments? If it had power of growth, what form might we expect that growth to take? If, thrown on his own resources and trusting to his own strength, the student sought to shape for himself a course along the sure paths of tradition, fresh perplexities awaited him, for he became aware that every one of the great productive bursts of energy which had borne such noble fruit in the past had on reaching a given point shown signs of being spent. The fortunate, but bewildered heir to a boundless inheritance of artistic treasure, he found himself frequently in the presence almost at the same moment of various works, each of high excellence, all bearing the impress of genius, and yet wholly different one from the other in the manner of their excellence; each apparently preaching to him a different doctrine. If he turned to contemporary art he was again, and finally, baffled; for while in the past he saw wide differences between school and school, between age and age, he found in his own time all these divergencies, asserting themselves side by side and simultaneously in each several country. He found an apparent absence in the present day—first of that inner organic growth, and secondly, of those fostering outward conditions which were seen in and around art in the old times; then the perplexing collapse of the several exhibitions of artistic force successively put forth in the past; both circumstances leading to the question how far art, torn from the parent stem of continuous tradition, could survive otherwise than spasmodically; and, lastly, the doubt how in the conflict of counsel and high example he should find guidance for himself. They would, he thought, presently see that art was fed by forces which lay in the depths of our nature, which were as old as man himself, and of which we need not therefore fear the durability; and further, that art with all its blossoms had but one root, its outward modes of expression being many and various, but its underlying vital motives the same. Primarily the source of all art whatsoever was the consciousness of emotion in the presence of the phenomena of life and nature. The most deeply impressive works were those in which the human interest and the æsthetic quality were most fully blended. Decay was imminent when the expression of this interest ceased to be sincere, and man no longer recognised his humanity in art. Having enlarged on these questions and views, he, in conclusion, urged those who might have entertained such doubts as those at which he had glanced, to put those doubts confidently away. Let them have faith that the stirrings which they felt within them were not the last spent waves of a retreating tide, but the pulses of a living force, now, indeed, fuller and now more feeble—yet as old as our humanity, and of which the days were not numbered. He would urge them not to vex themselves with the question whom they should follow, for if following meant imitation, they should follow none. Let them study with deep and reverent admiration—and that admiration could not be too deep or too reverent—the works of the great men who had gone before them. Let them brace and fortify themselves in the contemplation of their strength, catch what could be caught of the fire that was in them, but let them never forget that the common greatness of all those great men was their sincerity, and that it was only through sincerity that they could hope to emulate, even from afar, those masters of their art. Their work, in order to live, must be the direct and truthful reproduction of their own individual emotions, not the echo of the emotions of others. Without sincerity of emotion, no gift, however facile and specious, would avail them to win the lasting sympathies of men; for, as Goethe truly said,—

> "The chord that wakes in kindred hearts a tone,
> Must first be tuned and vibrate in your own."

THE FEMALE SCHOOL OF ART.

THE exhibition of the various drawings, paintings, and models, from the figure, by the students of the school in Queen-square, in competition for the honours of the year, is now open. Of the chalk drawings from the antique, that by Miss Margaret Dicksee gained the National bronze medal, and to others were awarded third grade prizes at South Kensington, while Miss Edith Gibson takes one of the Queen's National prizes in the same class of study. In the more difficult branch of modelling from the antique on a reduced scale, there are several creditable works—Miss Susan Ruth Canton's Dancing Faun, Miss Jacob's Discobolus of Naucydes, Miss Marcus's Discobolus of Myron, and the Torso of the Belvidere, Miss Cane's Torso Belvedere, and Miss Amelia Walter's Discobolus; three of these students—Misses Canton, Jacobs, and Walter—taking Queen's prizes in this class, and five gaining their admission into the schools of the Royal Academy. The chief honour to the school, however, is the gaining of the National Gold Medal for painting in oils from nature, open to all the schools in the kingdom, two years in succession. This year it is taken by Miss Catherine Martha Wood, for her large group of white azaleas in majolica vases. Miss Stone's group of yellow azaleas in blue and white china vases, which hangs close to the prize work, shows how earnest the competition was between two artists of such worthy rivalry. In flower-painting, a National silver was awarded for Miss Nisbet's branch of the bay-tree, and Miss West's hydrangeas took the National bronze. For a painting in monochrome from the antique, a Queen's prize was given to Miss M. E. Carter. Miss Wood's large basket of oranges deserves a passing word of commendation as a good piece of study in colour. The Vacation prizes for studies of skies are awarded to Miss Reason and Miss Stones equally, with an honourable mention to Miss Rose Welby; for studies of fruit and flowers, 1, to Miss Stones; 2, to Miss Welby; 3, to Miss Nisbet, while Miss Maud N. West takes a prize for a botanical sheet, Miss Bodo for applied design, which in this case is for a fan; and Miss Lockhart and Miss A. Lee for elementary outlines of plants.

In the general National competition, besides the medals and the two Gilchrist scholarships of £50, taken by Miss Payne and Miss Spiller, 41 awards and 33 prizes were won by the school in the third grade; so that altogether the ladies may be said to have come off with flying colours.

The Local Queen's Scholarship, to professional students only, of £30, for one or two years in accordance with certain conditions, was gained by Miss Florence Reason, the Subscribers' Scholarships of £10 and £20, by Miss Christmas and Miss Wood; the Princess of Wales' Scholarship, by Miss Wood; and the Queen's gold medal, for a head from the life in chalk, by Miss Christmas. The Clothworkers' Company Scholarship of £20, under certain conditions, had no entries this year; but this is the only lapse in the energetic work of the school, due probably to the peculiar conditions of the award, and, on the whole, the lady superintendent, Miss Gann, is to be highly congratulated upon the long continued success and most efficient conduct of the school.

THE NEW ORATORY CHURCH, SOUTH KENSINGTON.

DURING the erection of this building the congregation are provided, on another part of the site, with an iron church, one of the largest ever erected, measuring 113ft. long by 76ft. wide, exclusive of chapels, and standing upon an area of 10,000ft. Notwithstanding that the largest portion of it is allotted to chapels, chancel, sacristy, and corridors, accommodation is provided for 800 worshippers, and spaces for twelve confessionals.

The interior is lined throughout with matchboarding, stained in oil, so as to allow for further decoration, the woodwork in floors, walls, and ceilings being tongued and ploughed, so as to prevent any inconvenience arising from draughts, and, notwithstanding the apparent thinness of the walls, it will prove a particularly warm and convenient church, while its acoustical properties are unquestionable.

The whole of the works have been carried out, not as is usually the case, from designs prepared by iron-church builders, but from those furnished by Mr. Herbert Gribble, who is also the architect for the permanent structure.

It is lighted principally by an unbroken range of clerestory windows, and heated by five gas-stoves. Ample provision is made for exit, and a hydrant and hose, fixed in a central part of the church, with a continual supply of water, in case of accident.

The contractors for the work are Messrs. Croggan and Co., of 42, Upper Thames-street, who are proceeding with their task in a very satisfactory manner.

STEEL BRIDGES.

THE use of steel for structural purposes has generally been admitted to be a question of time, and that as iron superseded wood for bridge building, so will steel in the long run come out victorious in the struggle for preference going on between the two metals. Mr. Theodore Cooper, C.E., in a recent paper printed in the *Transactions* of the American Society, discusses the question as regards bridge structures. He observes that steel must enter upon the struggle for precedence with iron much in the same manner as iron did with reference to wood. Glancing at the history of American bridge-building, he shows what is true also of all structures in which iron has entered, that it was first exclusively confined to straps and bolts, then to the tension members of the web system, as in the Howe bridge and roof truss, and ultimately the iron bridge became an accomplished fact. The joint employment of timber and iron, especially when the latter was used in the shape of rods, only had the merit of cheapness and facility of construction. The use of iron for the compressive members of bridges was gradual; cast iron was first employed entirely for this purpose and for making connections, and wooden forms were closely adhered to. Very stubbornly cast iron gave way to improved forms of wrought iron, till we now have every refinement that experience and skill can suggest. Mr. Cooper shows that the most successful designers in iron have considered, not only the strains, but the minimum cost and other elements, and that the solution of the most economical proportions theoretically is vitiated by the necessity for taking into account various factors, such as the use of such forms and sizes of material as are procurable, the possibility of combining these forms into suitable shapes for the strains they have to resist; the relative prices of forms, the cost of manufacture, the cost of transporting and erecting different designs, the liability of long and light pieces to become distorted, the relative cost of bracing structures of different designs, &c. In considering the prospects of steel, Mr. Cooper observes justly, "the engineer has no right to brand any process of manufacture by specifying that only such a process or processes will be allowed." If any one process of making steel has objectionable characteristics, the specification should be drawn to exclude such characteristics, thus leaving all manufacturers to improve their product. "Open competition, upon a clear and well-defined specification, will soon develop the best mode of making, and the proper chemical composition of the material." Speaking of the tensile strength of steel, the author observes that the range extends from about 45,000lb. to four or five times as much, while its ductility ranges from about 50 per cent. to nothing, or extreme hardness. Material with such a wide range of physical endurance ought to be capable of use for any purpose; but it is necessary for the engineer to first understand the work the material has to do, and its ability to undergo the processes of manufacture. Thus steel, to be adapted for structural purposes, must be capable of standing the processes of rolling into various shapes, of being bent, cut, or drilled. The author shows that ductility is only gained by a sacrifice of the high tensile resistance of the harder steels, and the fact is well-established that great ductility is accompanied by a low tensile resistance, and vice versâ. The usual measure for ductility is the amount of elongation of a certain length of specimen under its ultimate resistance; but it is very necessary, as the author observes, that all comparative tests be made upon the same form and size of specimen; and a uniform size of 8 inches in length has been generally accepted, and for round specimens a diameter of $\frac{3}{4}$ inch, or a width of from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches for flat specimens. It has been found desirable to limit the grade of steel to a tensile strength of between 60,000 and 75,000lb. per square inch, and an elongation upon an 8-inch specimen of 25 to 15 per cent; the British Admiralty require "that strips cut lengthwise or crosswise to have an ultimate tensile strength of not less than 26 tons (58,240lb.), and not exceeding 30 tons (67,200lb.) per inch of section with an elongation of 20 per cent. in a length of 8 inches." All steel to be free from lamination and surface defects. Mr. Cooper next proceeds to consider the requirements of individual members of bridges, and the operations they have to pass through, such as chord and web eye-bars, lateral and diagonal rods, floor-beam hangers, pins, lateral struts, posts, top chord sections, floor beams and stringers. As regards chord and web eye-bars, the work put upon these bars is in forming the eye and boring the pinhole—the first operation being the only one which can do injury; lateral and diagonal rods, being subject to sudden strains, should be of more ductile quality than the above; floor-beam hangers should be also of very ductile steel, and pins of hard steel. As to compression members, as in the last described, a high quality of steel is recommended; but the severe mechanical manipulations through which they have to pass, as shearing, bending, punching, &c., require the softest steels. Hence, as a general rule, it is necessary to keep the quality of the metal down to the point where it cannot be injured by processes of manufacture; and secondly, that the ductility of the metal should be considered before its tensile strength. This ductility must be that of the rolled material, not that of the ingot, or samples of it worked differently. Lastly, the author observes, the importance of accurate measure of tensile elongation and strength in reference to the rapidity of applied strain, as both vary in quantity from a more or less rapid application of the strain; the necessity of determining the ductility of steel at different temperatures, and the desirability of testing all steel by impact or a falling weight. As to the best process of manufacture, the author observes of the crucible, Bessemer, and open-hearth processes, their relative cost must decide the question. Another question as to what effect the substitution of steel for iron will have upon proportions of bridges, and upon the form of the several members, cannot well be discussed till we have actual experiments upon different dedesigns; but Mr. Cooper hints that it is likely "that relatively lower heights of spans will be adopted for moderate size spans, owing to the necessity of avoiding too thin sections of metal." The effects of oxidation would also require, as in iron, a limit as to size of section, and the process of rolling will make a limiting thickness for channels, angles, and beams necessary. Hence it is thought that there will be no gain in the use of steel, unless its price is near that of iron; and as the same relative sections must be given to compression members in steel as in iron, the weight of iron cannot be reduced, and therefore there will be little economy in the use of steel in spans of ordinary sizes so long as steel is dearer than iron. From these considerations, and the discussion on the paper which took place, it is evident that engineers have yet to wait till data obtained from reliable experiments have afforded us some sure knowledge of the relative capabilities of steel as a substitute for iron. In Holland the use of steel girders for bridges has fallen into disfavour, on account of the failure of riveted beams under loads a fraction of what they had previously borne, showing the necessity of treating it with great care under manufacture. Probably, also, before steel can take the place of iron, some modifications in the forms of members exposed to different strains will be made.

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MARINE FOUNDATIONS.

A GREAT deal of ingenuity has been spent by engineers in the construction of the foundations of lighthouses and other similar structures. In some of these the stones are laid in off-sets to a considerable height above the rock, with the object of breaking the sea; each stone in the face is dovetailed vertically and horizontally into the adjoining stones, while a further precaution is taken by bolting each stone to the course below it by bolts of yellow metal and galvanised steel. Such a mode of construction was adopted in the Wolf Rock Lighthouse, off Land's End, considered the most difficult erection of the kind on the British coast. The rock on which it was built is 17ft. above low water. In another structure, well-known, the Bishop Rock Lighthouse, which, Findlay says, is probably the most exposed lighthouse in the world, the same construction is employed, and, as a rule in most sea-rock structures, massive blocks, dovetailed and dowelled together, have been used. A notable exception to this mode of construction was the plan devised for building the Phare d'Ar-men. The rock, Ar-men, presented formidable difficulties; it was almost impossible to obtain a secure footing; an iron structure was out of the question, on account of the difficulty of landing large pieces of iron framing; and, to make matters worse, the rock was divided by deep fissures. The method resorted to was as simple as it was bold: it was decided to bore a number of holes 30 centimetres deep and 1 metre apart all over the site, and others outside, in order to hold ring-bolts necessary for craft and to fasten lashings. In some of these holes wrought iron gudgeons were fixed for the purpose of fixing the masonry to the rock, and thus to make the construction itself serve to bind the different parts of the rock together. In addition to these gudgeons, horizontal iron chains were introduced into the masonry courses to prevent disjunction. The gudgeons were ·06 metres square and 1 metre long, made of galvanised iron, and the lower masonry was of small undressed stones set with Parker-Medina cement. Here we find a very different principle of consolidation necessitated mainly by the difficulties of landing large materials and also by the rock cleavage. Of course the object of dovetailing and dowelling the blocks together is not only to insure strength, but to prevent displacement of the masonry by the force of the waves during construction before the superincumbent weight of masonry could be brought to assist. In some other instances the courses of the basement are divided into a number of keystone-like parts, each of which is secured to the underlying stones by granite plugs let into the adjacent courses. Iron and screw piles have now superseded, in several cases, the solid foundations we have been describing, as in the instances of the Fowey Rocks, Ship Shoal and other structures in the United States; but the engineer of marine works will probably sooner or later have to resort to a method of building foundations under water in which the advantages offered by the combined use of concrete and iron must be acknowledged. The Government works at Dover harbour, and the harbour constructions at Douglas, in the Isle of Man, are instances in which concrete blocks of large size have been successfully employed; and the question appears to be worth a passing thought whether or not, by the use of iron in the shape of piles or pillars, together with chain-bond, smaller blocks of concrete might not be used with more economy in structures which have to withstand the force of the waves, or in places where the employment of large blocks would be attended with risk and difficulties. Blocks of Portland cement concrete might be cast or moulded into forms capable of being interlocked together in the same manner as the stones of Eddystone, the Bell, and Wolf Rock towers, and these could be secured to the rock by a system of iron uprights and horizontal bars, so that the structure may possess both vertical and lateral cohesion under the most trying circumstances.

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LONGLEAT.

A CAPITAL article, well illustrated, appears in the last number of the *Garden*, describing the glories of Longleat, one of the most charming of the many country mansions of the English nobility. Our contemporary naturally devotes most attention to the gardens and plantations, but appends a short description of the mansion itself, which is correct, except with regard to the picture-gallery, which is a much better one than the writer appears to think.

Longleat House was built by an Italian architect about the end of the 16th or beginning of the 17th century. The large and numerous mullioned windows are Elizabethan in character, while the pillars, statues, and ornaments are in the pseudo-Classical style prevalent in Italy at that date. The effect of the building, simple in form, but with all the richness of detail which the architect brought from his native country, is that of a thoroughly English house, an interesting example of the way in which a great artist adapts his design to the purpose for which it is intended. The whole has acquired by age a fine grey colour, varied by exposure to weather, and by those beautiful yellow and grey lichens, which give such a charm to any old stone-work which has escaped the ruthless hand of the restorer. The house is in the form of a square, with a central open court round which the necessary passages run, so that the windows in all the fine suites of rooms command various views of the park and gardens. The front door, always left hospitably open when the family are at home, leads into a large oak-panelled dining-hall, with a wide fireplace, hung with antlers and strewed with the skins of strange animals, tall plumes of pampas grass in huge vases harmonising well with the other decorations. In the various rooms and corridors there are some good old examples of inlaid cabinet work and of Oriental porcelain, but the most valuable treasures are in the library, where are many unique books and manuscripts, an account of which was given in the "Transactions of the Somersetshire Archæological Society" a few years back. The house is willingly shown to visitors, and the public are allowed to drive or ramble through the park, and enjoy freely all its beauties, woods, and glades.

The plantations and the wild garden, which are under the care of Mr. Berry, the forester, cannot but surprise a stranger on his first visit by their beauty and extent. The large vinery, which contains nearly 12,000ft. of glass, will also attract his notice. This was designed and erected by Mr. W. Buckenham, who has charge of the works on the estate, and whose ability is thoroughly evinced by the care bestowed on every department under his management, and only equalled by his courtesy to visitors.

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ELGIN CATHEDRAL.

THIS cathedral appears to have been a singularly beautiful attempt at restoration carried out in the commencement of the 15th century. It was founded by the Bishop of Moray in A.D. 1224, and the north and south transepts would correspond with this date. The south doorway of the latter transept is the finest part existing of the original cathedral; and to those who love the purity of detail which is the distinguishing feature of Early Gothic, this doorway would excel in beauty any portion of these most beautiful ruins. If this doorway be compared to that which once led into the porch of the south aisle of the nave, the meaning of that which I shall presently state will become more apparent. It has been thought that the transepts had formed a part of the pre-existing church, upon the site of which this cathedral was founded; but it is much more probable that they belonged to the original cathedral, and that at the restoration of the cathedral, which was burnt in A.D. 1390 by the Wolf of Badenoch, an additional aisle was built outside the original aisle on both sides of the nave, forming a nave and four aisles, which, if not wholly unique, is at least an unusual feature in Scotch churches. The west entrance to the nave is more interesting to the ecclesiologist than to the average tourist, who, having admired the richness of its detail, is content to hasten on to fresh fields of observation. At the first sight this doorway gives no reason for supposing that it contains a nearly equal proportion of work that has been done in the 13th and in the commencement of the 15th centuries. But it will be seen by those who can appreciate the differences of the mouldings, and character of the carving of these periods, that the whole of the jambs, caps, tympanum, and central shaft are certainly not of the same period as the bases, the great deeply-moulded arch of the doorway, and the three gables, one being above and the others on either side of it, and which evidently belong to the earlier period. An examination of the junctions of these members will remove all doubt. The character of the former members of this doorway is Late, but their general effect is certainly that of the earlier period, and they were evidently intended to have been a faithful restoration of that which had been destroyed in A.D. 1390. The carving of the central part of the doorway, although carefully imitated from the earlier work in character, never had the sharpness of that period. Except the plinth, and perhaps a part of the niches on either side of the great doorway, I should ascribe the whole of the west front, both in and outside, to the restored cathedral. It is worthy of notice that five of the dedication crosses remain incised upon the ashlar of the interior of the building. Of these three are in the choir, one in the south transept, and one in the centre spandrel formed by the double opening of the west door. The most difficult part of the building to understand is the choir, as it is that part which has apparently been the most faithfully restored, and the effect of which is decidedly that of 13th Century or very early Decorated work; but in reality the whole of this splendid choir, with the exception of one small part, and perhaps a few scattered stones, was built in the commencement of the 15th century. I say the general effect is that of Early Gothic work, but the reasons that I would allege in favour of its having been built at a late period, namely, after the fire in 1390 A.D., are these: that it is very unusual, if not without precedent, in 13th Century work, for rich window-jambs to correspond exactly both inside and outside; also the sills, string-courses, caps, hoodmoulds, and archmoulds of windows, which applies more especially to the lower tier of choir windows, but also generally throughout the choir. The 15th century restorers must have agreed upon one section for a cap, and repeated it more than eighty times in the lower tier of the choir-windows. The diaper work, which is used both on the inside and outside of the choir window-jambs, is a very good imitation of Early work, but all the dog-tooth mouldings have been set rigidly at right angles with the jamb. The choir triforium and clerestory combined is very interesting from the fact that it contains the only part of the early cathedral choir. This part is the westernmost bay of the triforium arcade on the north side. This bay is smaller and the cill higher than any of the others, and a close examination and comparison of its mouldings with those of any other bay of the choir triforium makes the difference in character more apparent. A peculiar feature in the choir, and one which cannot fail to interest those who visit this cathedral, is that on either side, and near the probable position of the rood-screen, a mass of shafts and hollows, forming a triangle on plan, its base being the wall, rises nearly to the height of the triforium cill, the tops of the caps to which are level with the cill. Above the cap line are three orders of rich carved work, each order being smaller than that below it. Having examined the surface of the third order, which is a few inches below the top of the choir wall, and which may be reached by walking along the gutter, I found that no stonework had been above it, from which I was led to suppose that the rood-beam had rested on these two small landings formed by the uppermost order on either side, and that the rood-cross either was suspended from it, or, more probably rested on it. The present choir has never been covered with stone vaulting, but had probably a barrel-vault of wood inside the high-pitched roof. The corbel-course of the choir, on both sides, is formed of masks, but all exactly alike in design and in character, and they are certainly unsuccessful attempts at restoration. In the chapter-house there are numerous carved fragments, chiefly of caps, bosses, groining-ribs, &c., and amongst which portions of the original cathedral occur occasionally, distinctly remarkable in their near proximity with the attempted restorations.

W. H. M.

OUR COMMONPLACE COLUMN.

KITCHEN.

PERHAPS a few words with regard to so important a part of a house may not be out of place. The kitchen nowadays seems to be, in the generality of plans, thrust into some corner with scant ceremony, and very little care whether the place be suitable or not. It is often condemned to a dark spot, while its companion rooms are in the full blaze of the sun, and those whose business it is to follow the culinary department, are doing so in an ill-lighted, ill-ventilated, and inconvenient place. At the same time, though "thrust away," it makes its presence felt, or rather smelt, by the multitudinous odours that steal out and roam at will from attic to basement. It would seem, therefore, that more attention to the placing, lighting, and ventilating the kitchen is needed than is usually given. No general rule can be given with regard to it, for a host of local circumstances will have to be considered in each case. The principles, however, may be hinted at which are needed to conveniently plan a kitchen. A kitchen should be large, well lit, lofty, and, above all, well ventilated; it should be easy of access, without having to pass through the house; sufficiently remote from the principal apartments of the house that the odours incident to cooking may not be perceived, nor the noises heard that the cook's operations give rise to; plenty of fuel and water close at hand, and the scullery, pantry, and store-room so near it as to give the smallest possible trouble in reaching them. The scullery should open out of the kitchen and always on the same level. Steps between scullery, pantry and larder are dangerous, though in the latter place they are sometimes unavoidable. The window or windows should be on one side only, and placed so as to admit of the least draught with the fire-place and doors. Special ventilation should be provided, so as to clear away in a short time steam, &c., without opening the sashes of the windows. In large houses, and where cost and other circumstances will permit, it is desirable that the kitchen should be only one story high; it could then be ventilated from the top, and might have a "hip" roof, and no false ceiling. In smaller houses, where it has to be roofed in with the main building, a door in the hall should shut off the entrance to the kitchen. Should it have to be placed with back against one of principal rooms, closets should be placed so as to prohibit sound from reaching the room. An ill-lighted kitchen is sure to be a dirty one. Steps between dining-room and kitchen should be avoided in all cases. A serving-closet in juxtaposition to the kitchen, and between it and the dining-room, is a time and trouble-saving institution. Cellar kitchens are detestable, and should be shunned if possible. A set-pot should not appear when it can be placed in the scullery or washhouse. A recess to receive the dresser is convenient, and adds considerably to the comfort of the place. A fixed "let-down" table is a "happy thought" if room will permit. Two doors opening close to one another are a great nuisance. It is not always desirable to enter the kitchen immediately from the outside.

J. A.

LANTERN.

THIS term is applied equally to a turret raised above a roof, dome, or tower, in order to admit light or promote ventilation. In the first sense it is sometimes called a louvre or *fumerell* for the escape of smoke, but the modern use of the term seems to be chiefly confined to any raised structure above a roof or ceiling, having apertures for the admission of light. Thus the term lantern is often applied to the raised skylight above a hall or staircase, or a domical-shaped aperture to a room. As an example of a lantern tower we may site the tower of Boston, Lincolnshire, and the octagon lantern over the crossing at Ely. It is conjectured by some, not without probability, that lights were placed in these open lanterns at night to serve as beacons. "Lanterns of the Dead" are a kind of pillars found in the Poiton and some other parts of France, having apertures at the top for a light to mark the site of a cemetery. They are generally small towers. It is thought probable by Mr. Parker, that the round towers of Ireland served a similar purpose.

LECTERN OR LETTERN.

Is the stand or desk on which the large books are placed in the Roman Catholic and Anglican churches. In this country lecterns are now largely employed from which to read the lessons. They often stand in the middle of the choir, and generally at its western end. Stone, marble, wood, and brass have been employed in their manufacture; in most modern churches they are of the two latter materials and are made with a movable desk, either in a single or a double slope. Mr. Parker illustrates several, one of wood at Debtling in Kent, of Decorated date, in which the desk is on all four sides elaborately pierced with geometrical tracery and foliage. The pedestal is panelled. The eagle or pelican with wings expanded is often used instead of the sloped desk to hold the Bible, but these are generally of brass. Costly embroidered hangings sometimes cover the desk.

LIBRARY.

THERE are several requisites in the construction of a library that must be considered—first, security against fire. This condition is best fulfilled by employing materials of a fire-resisting and uninflammable character, such as brick, terra-cotta, concrete, for the walls, and iron and concrete for the floors and partitions. Wrought iron should be employed for the beams, and encased in plaster, or terra-cotta (see Fire-proof Construction). Second, *good lighting* is another essential for a library: too much light cannot be given, for means can always be employed to reduce or soften it. There are one or two opinions on the question of the best mode of lighting a library. Of course, situation and circumstances will often necessitate a certain plan, irrespective of other considerations; but we are disposed to think that, for towns, top-lighting is desirable, both for insuring an ample and unimpeded supply of that element, and also because the readers are not so distracted by sound or sight as in the case of windows placed low down. Clerestory windows and vertical lights placed in the roof afford a desirable means, and can be regulated by blinds. With regard to the placing of the book-cases, there can be no doubt that greater space is afforded, and economy consulted, by disposing them at right angles to the walls, instead of longitudinally. The latter method, with windows above, has the disadvantage of rendering the titles of the books indistinct, the books being thrown into shade, or the glare of light making it difficult to distinguish them. When the books are arranged between the window-piers, and project into the room, this difficulty is not experienced, and a much larger number of volumes can be provided for. As regards plan and proportions, it would be useless to fix upon any, as the circumstances of arrangement vary so much. We throw out the hint, however, that a room of irregular form, having recesses, offers more comfort to the readers than one of great length, unbroken by transepts or bays. It is necessary, in planning small libraries, that a room should be placed in easy communication for the librarian or attendant, and it is desirable that this should be in as central a position as possible, so as to avoid loss of time in serving, as well as to economise supervision. The library of Trinity College, Cambridge, designed by Wren, is cited by Gwilt as a model. It is 190ft. long, 40ft. wide, 38ft. high, and is decorated with pilasters of the

Corinthian order. A good type of library is a room having a nave lighted by a clerestory and side aisles in which the books are disposed forming so many recesses, as in the Library of the London University, Gower-street. The Corporation or Guildhall Library may be mentioned, as well as the Great National Library or reading-room of the British Museum, designed by the late Sydney Smirke, R.A., a full description of which will be found in the Building News, Vol. III. Free libraries and museums have been erected in several towns of late years, and we refer the reader desirous of details to several that have been described and illustrated in the Building News. See the Liverpool, Derby, and Nottingham free libraries.

LIGHT.

Light and air, in the English law, are things in which no permanent property can be acquired. "Everyone," says Mr. Latham, "may use and enjoy them whenever he has the opportunity so to do; no one can acquire a future property in them." He goes on to say the right "consists in some obligation in some manner imposed on the owner of a given space, to refrain from so using it as to interfere with the light and air which will pass over it to the tenement to which the light is annexed." *Cujus est solum, ejus est usque ad cœlum* is a legal maxim, and any "interference with the space superincumbent on a man's land is an injury for which the law gives a remedy." Every man can deal with his land and the space above it as he thinks fit, so that he do no injury to his neighbour. The windows of his building may, therefore, be at the boundary of his land, and command a view of his neighbour's garden, or even of the interior of his house, and may invade his privacy; but this is not considered in law as a wrong for which any remedy is given. It will be observed, from the above definition, that no compensation is allowed for diminution of the value of a house caused by its windows being overlooked; therefore, the architect, in recommending the purchases of estates, should always have regard to the adjoining land and its development, and bear the principle in mind that the law will not interfere on the ground of invasion of privacy. (See Vice Kindersley's ruling, Turner *v.* Spooner, 30 L.J.) The right to light and air is acquired by continuous use for twenty years, by express or implied grant, and by a dominant and servient ownership distinct from each other. We refer those in quest of legal information to recent articles in the Building News, and to the treatises on "Ancient Lights," by Mr. Homersham Cox, and Mr. Banister Fletcher.

MEASUREMENT OF OBSCURATION OF LIGHT.

In the measurement of obscuration, the best mode of proceeding is to take the angular height and angular width of the obstacle, as measured from the window aperture, and to find out by the tables published, as given in Cox's treatise, the amount or percentage of obscuration. The angle for the width is measured from the line perpendicular to the plane of window, and is the angle which the obstacle subtends at the level of the window. The right-hand and left-hand portions of the angle made by the obstacle as seen from the window must be measured separately, and the obscurations added together. (See articles in Building News on this subject.) Another method recommended by some surveyors is to estimate the loss of daylight at different periods of the year, without recourse to mathematical principle, having regard chiefly to the particular use of the light required, and various other circumstances affecting the dominant owner's premises, as cost of alterations, inconvenience, &c. A *material* diminution of light is necessary to sustain an action.

LIMOGES ENAMEL

Is a beautiful kind of encrusted work, or painting on an enamelled copper surface practised by the Limoges artists in the 16th century. Generally, the Limoges enamel was transparent, the designs being shown on the metal under it, which is dug out into cavities of various shapes to receive the enamel.

A new Wesleyan church was dedicated at Clough, near Newtownbutler, on Sunday.

At a meeting of the committee of proprietors of Drury Lane Theatre, held on the 9th inst., Mr. C. J. Phipps, F.S.A., was appointed architect of the company, in the place of Mr. Marsh Nelson, resigned.

COMPETITIONS.

Hull Borough Lunatic Asylum.—At a meeting of the Borough Asylum Committee of the Hull Corporation, held on Friday last, the Chairman (Mr. Witty) reported that he and the ex-Mayor had waited upon Mr. Hartley with reference to the plans for the new Asylum. He pointed out to Mr Hartley that there was a probability of the Government taking the institution into their own hands. Three plans had been received, but it was not thought advisable by the committee that the names and amounts should be published until after the meeting of the Justices.

Leigh Public Baths Competition. — The premiums of £10 and £5 offered in competition for the Leigh Public Baths have been awarded to Mr. J. C. Prestwich, Leigh (design marked "Ecce"), and Mr. J. J. Bradshaw, Bolton (design marked "1879.") The conditions of competition stipulated that two plunge baths, with the requisite dressing compartments, and a number of private baths should be provided, and that the cost should not exceed £2,500. The site chosen occupies about one-half of the plot of land between Bold-street and Silk-street, to which latter street it has a frontage of 83ft., and towards which the main entrance and keeper's residence were to be planned. It is stated that the Baths Committee were informed by the professional gentleman, who was selected to specially examine as to planning and cost, that Mr. Prestwich's design could, in his opinion, be carried out for a very small amount above that stipulated.

The New Town Hall and Public Offices at Eastbourne.—The following has been addressed to the Surveyor of Eastbourne:—

Dear Sir,—I beg to enclose a circular letter that has been sent to all the members of the Royal Institute of British Architects. It necessarily deals more particularly with the professional side of the question, but the public are so vitally interested in the subject of "open competitions," that I venture to hope your Local Board will co-operate in every way to minimise the evil of the present system of unlimited and unrestricted competition. I would venture, before it is too late, to suggest that from the number of applicants for particulars of the above competition, the Board should make a selection of six (or 12 if they wish more), and restrict the competition to this number, and instead of giving £75 and £50 in premium, that the author of the *selected design* be employed to carry out the work, and that the remaining competitors should be paid £10 each honorarium to cover personal expenses. I feel sure that by this course you would be benefitting the profession, and that you would receive a number of well-thought-out designs from able men, instead of being *flooded* with an unlimited amount of drawings, many of which would be probably from mere juniors and inexperienced men. I would suggest that half the number of the competitors should be selected from Members of the Institute, and half from members of the Architectural Association, so that no favour should be shown to any exclusive party. The subject is of such importance that I do hope you will call a meeting of your Board to take this matter into consideration, and will you kindly favour me with an answer (should you think favourably of my proposition), that may be published in the professional papers? The Board have now an opportunity of setting a noble example to other committees, and I feel sure it would be very readily followed by many who contemplate advertising for designs in competition. In selecting your limited number (if you elect so to do) it would be well to select those who have had experience in designing and carrying out such buildings as you contemplate. I need hardly say that I have no intention of competing for the building myself—either in open competition or limited competition—and therefore my suggestions are wholly in the interest of the public, and the profession to which I have the honour to belong.—Waiting your reply, I remain, dear Sir, yours very faithfully,

Thomas Porter.

Charles Tomes, Esq.

At the Board meeting on Monday week the matter was discussed as follows:—

Mr. Goaringe: Who is Mr. Thomas Porter?

The Clerk: A member of the Royal Institute of British Architects.

Dr. Jeffery: The suggestion is a very good one, but it comes too late.

Mr. Tomkinson: I think so, too.

Several members having expressed themselves to the same effect,

The Surveyor said he had already sent particulars to 240 persons, and still had four or five more to answer. (Laughter.)

Dr. Jeffery: Well, gentlemen, what is your pleasure shall be done with this letter? I suggest the Clerk write to Mr. Porter, and say we are much obliged to him, but have gone too far to carry out his suggestion.

The following is the Surveyor's reply:—

Eastbourne Local Board,
Surveyor's office.
Eastbourne, Dec. 3rd., 1879.

Dear Sir,—I laid your letter *re* Town Hall competition before my Board, and they are of opinion, as you will see by a paper I have sent you, that they have proceeded too far to allow of their carrying out your suggestions, although had they received it before, they would have had great pleasure in adopting that method.—I am, dear Sir, yours very faithfully,

(Signed) Chas. Tomes, Surveyor.

T. Porter, Esq.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

British Archæological Association. — The second evening meeting of this society was held last Wednesday week, when the chairman, Mr. Thomas Morgan, F.S.A., mentioned that he had received a communication from Mr. Roach Smith, F.S.A., one of their vice-presidents, to the effect that it was in contemplation to petition the Earl of Verulam to allow some further explorations to be made upon the site of the well-known Amphitheatre of Verolamium (Verulam), which would no doubt be acceded to, and probably present important results to the antiquarian world. Mr. Morgan then concluded his paper "On the Proceedings of the Recent Congress at Great Yarmouth," particularly dwelling on the interest attaching to the closing three days, spent at Norwich, where the members and visitors had been so ably instructed by Dr. Goulburn, the Dean of Norwich, in the history and elucidation of the architecture of its beautiful cathedral, and subsequent examination of the fine old churches and mediæval buildings of the city, under the guidance of Mr. Phipson, F.S.A., and others. In referring to the visit paid to Blickling-hall, at the invitation of its owner, the Marchioness of Lothian, he described its many interesting architectural and historic features, mentioning especially the noble library, in which there were some 10,000 volumes, many of them printed by Aldus, and the two copies of Coverdale's Bible, the Sedan New Testament, &c. Mr. Wright, F.S.A., in remarking upon the chairman's very exhaustive *résumé* of the doings of the association in Norfolk and Suffolk, called attention to the disputed point as to whether Anne Boleyn had been born at Blickling-hall or Hever Castle. He expressed his belief that from tradition as well as the researches of Spelman, who died in 1643, only some few years over 100 after Queen Anne's execution, there could be little doubt but that the unfortunate lady had first seen the light at Blickling-hall, the ancient seat of her family. In support of this view Mr. Wright quoted the following extract from Spelman's "Icenia," which he thought might fairly be taken as conclusive evidence on the matter:—"A læva Blickling, Bolannorum, aliquando sedes, e quibus orti sunt Thomas Bolen, comes Wiltsheriæ, et Anna Bolen, uxor Legis Henrici VIII., optima Principis Divæ Elizabethæ mater, natalitium hic sortita." The meeting stands adjourned until the 7th of January next.

Roman Remains in Kent.—At last week" meeting of the Society of Antiquaries, Mr. George Payne, jun., of Sittingbourne, Kent, exhibited and described a remarkable collection of objects taken by him from a Roman grave, discovered on the 6th of last month at Bayford, near that town, 20 yards from another Roman grave, unearthed in 1877, and showed by him at the society's meeting of May 3 in that year. The antiques last found were of glass, pottery, and metal. To the last category belonged a square cinerary vessel of blue glass, a small pale greenish blue glass jug, a round pale blue glass bottle, fragments of a small vase of white transparent glass, and a pale olive green glass vase. The ceramic objects were a delicate cream-coloured vase slightly ornamented, two urns of Upchurch ware, a pitcher with red clay handle; half-a-dozen Samian pateræ; nine Samian cups, one of them ornamented with a leaf pattern. By far the most interesting metallic object was a fine vase in bronze, $10\frac{1}{8}$in. high., $6\frac{1}{4}$in. broad at the widest part, $3\frac{5}{8}$in. at base, $2\frac{1}{4}$in. at neck, and widening at the rim to $3\frac{3}{8}$in. The handle is of solid metal and very massive: that portion of it which is fastened to the body of the vessel is beaten into a kind of shield $2\frac{1}{4}$in. in width, upon which is shaped in high relief the figure of a man in a nude state standing in an attitude ready to attack. In his right hand is an uplifted sword, in the left, which is raised to the centre of the body, is the scabbard, and over the arm is thrown the cloak, the folds hanging below. On the head is a cap; his mouth is open, as if in the act of shouting. Under the right hand is a decapitated ram or goat, legs uppermost, with blood flowing from the neck, the head having fallen at the man's feet. Between the man's legs reclines an ox, and outside the left leg is the head of a boar with uplifted snout. Above the man's head the decoration is continued up the handle, which at this point contracts to about an inch; here a goat is represented galloping; over it are two animals somewhat indistinct; above them is the figure of a man seated and holding a crook in the right hand. The handle above is encircled half-way round by a band with a thin line of silver in the centre. The rim of the vase is clasped by the heads of two birds, with eyes of silver, and the long beaks are drilled with holes to represent teeth. The necks of the birds are divided by a scroll pattern, which flows down the handle to the band before mentioned. The only iron object is a lamp-stand, with bar for suspension. Additional bronze antiques were fragmentary strigils, and a rack with strigil attached by a device resembling our split rings.

Building Intelligence.

Bradford.—Christ Church, Bradford, was consecrated last week. The building has cost £11,250, and seats about 800 persons. The ground-plan consists of a nave, 90ft. by 25ft.; north and south aisles, 62ft. 6in. by 13ft. 6in.; north and south transepts, 23ft. by 20ft.; and apse-ended chancel, 30ft. by 25ft.; choir vestry, 17ft. by 16ft.; and clergy vestry 11ft. by 11ft. The internal height of the church from the nave floor to the ridge of the roof is 51ft. 6in. The style is Early English, with a few features of Early Decorated character. Foundations have been laid for a tower and spire at the north-east corner of the north transept, but at present the roof has been put on at a height of about 20ft. from the ground. The carvers' work and the pulpit have been done by Messrs. Farmer and Brindley, of Westminster. Mr. John Wilson has acted as clerk of works, and the architects are Messrs. W. and R. Mawson, of Bradford.

Donagheady.—The church of St. James, Donagheady, diocese of Derry, was consecrated on the 28th ult. Sittings are provided for 350 persons. The building, Early English in style, has nave, transepts, and chancel, with vestry, &c., and a tower and spire upwards of 90ft. in height. The walls, which are battened throughout, are built of local whinstone, with Dungiven freestone dressings, spire, &c. The windows are filled with hammered glass in two tints, in zinc sashes. One of Porritt's underground stoves does the warming. The cost is close on £3,000. Messrs. Colhoun Bros., Londonderry, are the builders; and Mr. John Kennedy, M.R.I.A.I., Londonderry, the architect.

Leytonstone, Essex.—A new parsonage-house, for the district of Holy Trinity, Leytonstone, has just been erected. The house has been planned to meet the requirements of a small living. The exterior is faced with picked stocks, relieved with red brick quoins at the angles and reveals of windows; the arches, &c., are also of red brick, and the amount of the contract was £2,100. Mr. John J. Bressey, of Ethelburga House, Bishopsgate-street, is the architect, and Mr. James Brown, 2, Broad-street-buildings the builder.

Lincoln.—The new Corn Exchange at Lincoln was opened last Friday. The ground-floor comprises a covered market, 140ft. long by 52ft. wide, with shop and warehouses at the western end to let off; at the opposite, or east end, are the stores, and an apartment for testing weights and measures. On reaching a broad landing, there are three entrances, having wide folding-doors, into a well-proportioned Corn Exchange, 140ft. long and 52ft. wide (the area being one-half as large again as the old exchange) with retiring-rooms at the eastern end, having a gallery over these and the second entrance lobby, available for various purposes. The contractors were Messrs. Walter and Hensman, of Horncastle, the whole being carried out from the drawings and under the superintendence of Messrs. Bellamy and Hardy, architects, Lincoln, who have erected no less than fourteen corn-exchanges. Mr. George Bacon was clerk of the works. The exchange is heated with hot air by Constantine's patent convoluted stoves.

Lympne.—A special service took place in this parish on Tuesday week to celebrate the reopening of the ancient parish church of St. Stephen. The chancel was well restored about seven years since. A year or two ago the tower portion of the church was reopened and restored, and now the same has been done in the nave. The architect employed was Mr. J. Piers St. Anbyn, and the builder Mr. H. B. Wilson, of Canterbury. The estimated cost of the entire restoration was £2,081. In the tower two Norman windows and Norman mouldings have been uncovered. The tower roof has been entirely renewed, and the roof of the nave has been repaired, and the timbers opened in that of the aisle. The floors and seats are new throughout, and also the doors and windows. In the course of the work the original Norman font, which was buried and broken, has been restored.

Manchester.—A new Wesleyan chapel, erected at the junction of Plymouth-grove and Hyde-grove, was opened by Dr. Pope (Didsbury College), on Thursday, 4th inst. The chapel is built of stone, and is designed in the Early Gothic style. It is lighted by an arcade of windows on each side, and with a four-light window in the main gable. The internal dimensions of the building are 63ft. long by 37ft. wide. Sittings are provided for 350 persons. The roof is lofty and in one span, waggon-headed in form, divided into panels with moulded ribs. The open seats, roof-timbers, &c., are all of pitch-pine. The entrance-doors are at each side of the chapel, and a narthex is formed by a wooden screen (glazed with cathedral glass) cutting off a passage-way 8ft. wide, the entire breadth of the building. Doors in the narthex, and again in the screen protect the congregation from draughts. In case of alarm of fire, the doors are arranged to open outwards. Vestries, class-rooms, and keeper's house have also been built, and the total cost at present incurred will be about £5,500, including land and boundary-walls. Ample space still remains on the site for a large chapel—contemplated at some future time—capable of seating 1,000 worshippers, and with a handsome tower and spire. The contract for the present building was intrusted to Mr. L. C. Webster, Brook-street, and the works have been designed and carried out under the supervision of Messrs. Hetherington and Oliver, architects, Carlisle.

Portsmouth.—The new Presbyterian church at Portsmouth is approaching completion. The contract price is £6,000, and the church will seat 850 persons. There is also a lecture-hall, session-room, vestry, and other apartments. The walls of the church are of the best Fareham bricks, and the stonework is from the Box Quorn, Bath Stone Quarries. The carving is the work of Mr. Bradford, of London. The work has been well carried out in all respects by Messrs. Light Brothers. The architect is Mr. Thomas Arnold, of 10, Basinghall-street, London.

Salisbury.—A new middle-class school has just been erected at Salisbury. The school, which is only the first part of a proposed larger building, is built entirely of red brick, in the Queen Anne style, relieved by projecting chimneys, porch, and heavy mullioned windows. Brick carved panels are inserted in the chimneys, which were executed by Mr. Harry Hems, of Exeter. The architect is Mr. R. J. Withers, of London. Mrs. Hale and Sons, of Salisbury, are the builders. The cost was about £6,000. On Wednesday week Mrs. Hale and Sons' workmen, to the number of sixty, were entertained at supper at the expense of the Rev. W. C. Baker, the promoter of the undertaking.

Stretford, Manchester.—The Local Board of Stretford have completed the widening of the bridge over the Bridgewater Canal, at a cost of £1,200, from the plans and superintendence of Mr. H. Royle, their surveyor, the general work having been carried out by Messrs. McGregor and Badman, of Manchester, and the ironwork by Messrs. Rankin, of Liverpool. Plans have also been prepared by Mr. Royle for a scheme of drainage, by which it is proposed to pump the sewage on to land in the board's own district, the estimated cost of works being over £40,000.

Walton.—Three or four years ago—more, perhaps, from compulsion rather than from choice—the West Derby guardians decided upon erecting schools at the Walton workhouse for the large number of children entrusted to their care. The new buildings are not of an ornamental character. They consist of six blocks of elongated cottages, and a centre administrative block, in which is a large dining-room, a kitchen, workroom, and drying-stoves. The six other buildings are three stories in height, and are constructed to accommodate in each block 50 children. The exterior of the buildings is of grey brick, with white stone facings. A female hospital, constructed upon the "pavilion" principle, has been built, at a cost of about £7,000; an increase has been made to the old men's ward at an expenditure of some £3,000; and an addition to the imbecile ward has cost about £800. The architect of the new buildings is Mr. Chambers (Messrs. Picton, Chambers, and Bradley), and the sole contractor is Mr. Litt, of Bootle.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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OUR CHRISTMAS NUMBER.

The Christmas Double Number of the Building News, which will be published on Friday next, will be the largest yet issued. It will consist of sixty-four pages of letter-press and eighteen pages of illustrations, the latter embracing choice examples of works by W. Burges, Esq., James Brooks, Esq., the late Viollet-le-Duc, the late Sir Gilbert Scott, W. H. Lynn, Esq., R. Phené Spiers, Esq., and others.

Orders for the "Christmas Double Number" should be given at once, to prevent disappointment.

Received.—W. G.—C. Bros.—J. C. and Son.—S. C.—F. T.—J. and E. G.—T. B. and Co.—W. Bros.—M.—G. E. H.—L. and N.—Rev. J. Shaw.—P. P. P.

Youngster. (Write B. T. Batsford, 52, High Holborn, W.C.)

"BUILDING NEWS" DESIGNING CLUB.

Motto H. (The porch is of course intended to project.)—F. W. Smallwood. (We endeavour to point out defects of design in every case, but you must remember our space is limited.)—Honey Dew. (We note your letter.)

Drawings Received.—Tace, Heart and Arrow, Ogmore, Fleur-de lis, Clansman, Semper Paratus, Burswell, B., Pro Bono Publico, K. in Circle, Rusticus, Stone, Gwyndwr, Mot, Wasp, Timeo, Lancaster, A Set-square, Greyhound, Resurgam, Figaro, Motto T., No. 90, As You Like It, B. in Circle, Castello, Spray in Circle, Frank Tireur, Edwin, Our Praises, &c., Toltec, Domestic, Fidessa, Excel. Am I?, Such a Dog, Quod, A. U. C., Toledo, N. or M., E. in Circle, Attempt, North-West, Subjudice, J. L., Never Too Late to Mend, Ora et Labore, Gwent, Jack, Peace with Honour, Streonshalk, Peratus, Honey Dew, F. W. in lozenge, N. B., Sich Rosa, What do you Think?, North, Duncan, Macillistre, C in Circle, Black and White, Nineteenth Century, Alonzo the Brave, N. R. O., M. A. A. in Triangle, F. in Circle, Pendennis, Time, Sub-Silentio, Mediocria Firma, Minted, War, Hangling. Gladstone v. Scott, Intersecting Circles, Binny, T-square, Null Bien. &c., Lapis, Scopilton, Attempt, Presto, F. in Circle.

Notice.—Pressure on our space compels us to postpone our review of the designs for a week or two.

Correspondence.

THE FUTURE OF PORTLAND CEMENT.

To the Editor of the Building News.

Sir,—In reply to your correspondent "B" as to effervescence from the use of Portland cement in house-building, may I be permitted to point out, it would be necessary to ascertain the circumstances of the cases to which he refers before one could arrive at the conclusion that that effervescence was entirely due to the use of Portland cement?

Effervescence arises from a salt feebly combined with water of crystallisation, which, when exposed to the drying influences of air, throws off that water. In either bricks, lime, or Portland cement, there may exist the ingredients necessary for the production of an efflorescent salt; hence it as frequently occurs that a brick wall built of lime-mortar shows efflorescence as one built of cement-mortar. Portland cement probably contains only one of the ingredients necessary for the production of an efflorescent salt, viz., sulphur; but if that cement be brought into contact with bricks or sand, containing soda, say, in the form of common salt, then the ingredients necessary for the production of a very highly efflorescent substance may thus be brought into chemical union, and efflorescence would be expected. Your correspondent also mentions the destruction of oil-paint. It is most probable this did not arise from the efflorescence, but from the exudation of lime-water, which has a most powerful effect upon oil, turning it into a kind of soap. The cure for this is to leave the walls unpainted for two or three years, as by that time it is most probable the exudation of lime-water will have ceased. As an illustration of this subject of efflorescence, in a recent concrete building, composed of one of finely-ground cement and 11 of ballast; portions were carried out with salt water, sea-sand, and shingle, and other portions with fresh water, pit-sand, and pit-gravel; the former concrete showed efflorescence, the latter had none. It was supposed in this example the concrete, with so small a proportion of cement, would have been weak; instead, however, of such being the case, that concrete was really far beyond the strength required for house-building. By using ordinary skill in calculating the extensibility of the Portland cement, and the surfaces of the ballast to be covered with it, a 3ft. thick house-wall could be built of ample strength, having only one part of ordinary commercial Portland cement to 20 or 30 of ballast, and it is within the range of probability that, with superior methods of sifting and grinding, a concrete having 50 parts of selected ballast, could be prepared, having ample strength for thick house-walls. This consideration shows the vast importance of the subject you have raised in your columns as regards sand-testing, and it is to be hoped that you have really given the death-blow to the present irrational system, a system which neither gives an accurate result as to the chemical nor the mechanical properties of the cement, but a combination of these two in such a manner that it is not possible to say what is the amount of the result due to chemical action, and that which is due to the mechanical structure. It is a fallacy to suppose that chemical superiority is all that is required in a good cement; because it is capable of experimental demonstration, that a very inferior cement in its chemical properties may, from its suitable mechanical structure, give the strongest concrete. Of course, the aim ought to be the highest chemical properties combined with the best mechanical structure for covering sand, and the sand-test suitably applied is the practical way to bring this to light.—I am, &c.,

Parkstone, Dorset, Dec. 6. A. C. P.

Sir,—The able article on this subject which appeared in your issue of November 28th will, I think, do much to awaken an interest among users of a constructive material of wide application, the properties of which are not so generally known as they should be. Consequently, failures occasionally occur from its careless or unskilful use, and the blame, together with a claim for compensation, is generally laid at the door of the manufacturer.

Your suggestions as to a uniform method of testing will, I hope, lead to some result. The present system of estimating the value of cement by its tensile strength at the end of seven days, when gauged neat, is a most unsatisfactory one, for many cements that are in anything but fit condition for use will give the highest obtainable results when submitted to it. This test alone is not sufficient to decide the value of a cement.

The sieve-test is a most important one, and I think that a stipulation that all the cement should pass a 40-mesh sieve would not press hardly on the manufacturer. This degree of fineness may be readily obtained by a process of sifting, as suggested in your article, and returning the core to the elevator. My own opinion is that this is the most economical way of obtaining even a moderate degree of fineness when the sifting process is, as it may be, an entirely automatic one.

I trust that some effort may be made to reconcile the conflicting opinions that at present exist on the subject of cement-testing, and to lay down certain well-defined conditions which a high-class Portland cement should fulfil. Such a state of things would benefit not only the user, but also the manufacturer.—I am, &c.,

Cement Maker.

MORTAR.

Sir,—Your correspondent, Mr. Clark, is quite right in attributing to the presence of charcoal the resistance to the action of frost that mortar has, which has been made with black casting-sand. This casting-sand contains a considerable amount of charcoal—a very varying amount, since every founder has his special ideas as to what are the right proportions—and some oxide of iron, which gets accidentally into the mixture in the course of casting.

Although it is not used, I believe, in the metropolitan district as a component of ordinary mortar, a considerable quantity is consumed in the making of black pointing.

The explanation of the resistance to frost by mortar made of the black sand, lies in the porosity of the charcoal. It is a well-known fact that water contained in minute pores and interspaces may be lowered many degrees below its normal freezing-point without solidifying. M. Depretz showed that water might be lowered to a temperature of 20 below zero (on the Centigrade scale) in fine capillary tubes without becoming solid. An illustration of this fact may be seen in plants that have been exposed to a severe degree of frost, without freezing the sap in their capillary vessels.

The excess of water in the mortar being contained by the charcoal, therefore, does not freeze unless subjected to an extremely low temperature, and so the mortar does not disintegrate and chip out of the joints. The presence of the oxides of iron in the sand can have nothing to do with the question.—I am, &c.,

Chas. E. Bean, F.C.S.

MR. NORMAN SHAW'S WATER-CLOSETS.

Sir,—Last year, considerable correspondence occurred in the Building News, as to Mr. Shaw's proposal to use only a simple glazed pan and siphon-trap to shoot into the open hopper of an external soil-pipe, and so obviate any direct connection with the drain, and any necessity for continuing the soil-pipe above the closet for ventilation. It was then objected that the plan would not work efficiently during frosty weather; but Mr. Shaw gave his experience that no inconvenience was caused during the rather severe winter then just passed. I have adopted the system at my own house, with a result most perfect, until the last week of low temperature; my soil-pipe is now blocked up with ice, and nothing will pass it. I should like to hear the experience of others, now that a longer time has elapsed for trial. I may add that my pipe is embedded in a chase on the exterior face of a wall facing north.—I am, &c., W.

DRAWING INSTRUMENTS.

Sir,—Your Hull correspondent is under an entire misapprehension of the subject he writes about. My instruments, I beg to say, are the most expensive of a first-rate London maker, yet, I assert, they are capable of improvement. My work is good, but, with better tools, might possibly be better; at all events, I should work with greater facility and comfort. "Hull" does not comprehend my remarks on set-squares, and he evidently is not draughtsman enough to appreciate the defects in curves. These things are common in "respectable offices," but I never saw them put in use. I have a great number of them in my office that have been purchased from time to time, with the hope of getting something useful. All, however, are equally bad, and mine is not a solitary experience. I called last week, on business, at the office of a mechanical engineer, in London. Seeing a number of the ordinary French curves hanging up, I remarked on their uselessness. "You are right," said the engineer, "I found that out when I wanted to put wheels in projection. But these are what I use," continued he, opening a drawer and producing several oval bits of wood, "These are conic sections. I, with some difficulty, made them myself." Then, Sir, for the first time, I saw the curves I so long had wanted. As, however, we cannot all make these things, I hope some enterprising tradesman will look to it, and supply the desideratum. He should, however (and all who want drawing appliances disposed of), advertise in the Building News, and the *English Mechanic*, for this simple reason: he will get to the younger, the more active, the working-bees of the professional hive. The curves should be from 2½in. major diameter, up to 12in. For lack of these things, circular forms, either in projection or perspective, can never be properly done. If to a large scale, the parts are set out from plan and elevation, and such curves are required wherewith to neatly ink-in. In lesser drawings, the rules only make one subject to error, and the eye has to be depended on. Pointed arches in perspective are usually struck from centres, but such are very inaccurate, and round arches, partly struck and partly "gaff'd," are generally lamentably defective—as, for instance, in the porch drawing in last week's Building News. "Rarely ever" can a correct form of arch be seen in perspective, and the same defect is visible in showing cornices to circular buildings, and this is simply from the want of conic section curves.

"Extiber" is a correspondent of a different class to the other. To him I beg to say, the point of bow-pencil ought to be, and might be, longer for lead, without being clumsy. See what small and perfect things are made in "ever-pointed" pencils! I think the arrangement of the new drawing pencil I referred to might be applied to the bow pencil, and so get rid of the projecting and clumsy screw at the side. I saw, some thirty years ago, in the country, the framed set-square alluded to, but have never seen them in London. They are but scarce. The vulcanite might safely have the inside cut out, as is done with the curves in that material, and, as regards the curves, a stupid thing it is cutting them, for such inside curves cannot be used. This again shows the ignorance of the people who manufacture to their fancy, instead of what people want. I recommend "Extiber" to practise with the parallel rule. I use it to entire exclusion of set-square; consequently my drawings are always clean, and neatness and accuracy are more certainly attained in drawing.

I know I can get rules cut to order; but I think such as I name should be ready, and on ivory. I should advise every one to discard wood if they desire to be good draughtsmen.—I am, &c., M.

HERNE-HILL CHURCH COMPETITION.

Sir,—It would be interesting to know whether there is any truth in the rumour afloat, that a number of sets of drawings beyond those of the six selected competitors were accepted and considered for the Herne-Hill church; that a set of drawings outside those sent in by the selected competitors has been chosen, and that the statement that the six designs exceeded the amount to be spent was—well, an excuse. If this is true, have we not some remedy againt the committee?—I am, &c., One of the Six.

LEADEN FONTS.

Sir,—In an interesting communication to *Notes and Queries*, Mr. Edward Peacock quotes a number of leaden fonts that have come under his notice. This is the list he gives:—

Ashover, Derbyshire.—A stone font, ornamented with figures of the apostles in lead.—*Archæologia*, x. 187; *Journal of Arch. Inst.*, vi. 163.

Barnetby-le-Wold, Lincolnshire.—Circular, late Norman, "adorned externally with three bands of scroll-work, cast in relief." It had long been disused, and was found by the present vicar, the Rev. B. Street, used as a vessel for containing lime-wash. An account of it, with an engraving, appears in *Rep. and Pap. of Ass. Arch. Soc.*, 1858, p. 248.

Brookland, Kent.—Norman, ornamented with signs of the zodiac. Paper, illustrated by engraving, in *Journal of Arch. Inst.*, vi. 159.

Brundal, Norfolk.—*Journal of Arch. Inst.*, vi. 163.

Childrey, Berkshire.—*Ibid.*

Chirton, Wiltshire.—*Ibid.*

Clewer, Berkshire.—*Ibid.*

Clifton, Oxfordshire.—*Ibid.*

Climbridge, Gloucestershire.—Dated 1640. *Ibid.*, 162.

Dorchester, Oxfordshire.—" The leaden font is small, and set on a large shaft of stone."—Richard Gough, in *Archæologia*, x. 187.

Edburton, Sussex.—*Journal of Arch. Inst.*, vi. 163.

Frampton-on-Severn, Gloucestershire.—Of the twelfth century. It " stands against the north-west pillar in the church, and is in tolerable preservation, but covered with coats of blue and yellow paint. The bowl is half an inch in thickness and two feet three inches in diameter by one foot three inches in depth."—Paper, with engraving, in *Journal of Archæolog. Ass.*, ii. 184.

Llancaut, Gloucestershire.—Circular, Norman. Engraving in *Archæologia*, xxix. 24.

Parnham, Sussex.—*Journal of Arch. Inst.*, vi. 163.

Pitcombe, Somersetshire.—*Ibid.*

Plumstead, Great, Norfolk.—*Ibid.*

Siston, Gloucestershire.—*Ibid.*, 162.

Tidenham, Gloucestershire.—Circular, Norman. Engraving in *Archæologia*, xxix. 24.

Walmsford, Northamptonshire.—Said to be of lead in *Archæologia*, x. 187, but the statement contradicted in *Journal of Arch. Inst.*, vi. 163.

Walton-on-the-Hill, Surrey.—*Journal of Arch. Inst.*, vi. 162.

Warborough, Oxfordshire.—*Ibid.*, 163.

Wareham, Dorsetshire.—*Archæologia*, x. 187, quoting Hutchins, i. 34.

Wittenham, Long, Berkshire.—" Circular, standing on a massive stone base; it is of Transition Norman character, almost Early English, ornamented with small circles of foilage, and with a row of small figures under pointed arches."—Paper signed J. H. P., accompanied by engraving, in *Journal of Arch. Inst.*, ii. 135.

Wolstaoe, Berkshire.—*Ibid.*, vi. 163; vii. 317.

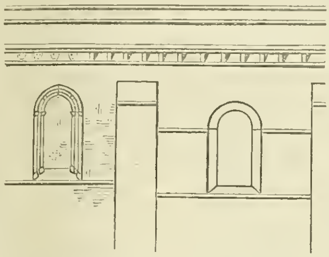
In the Museum at Rouen three leaden fonts are preserved, of the eleventh, fifteenth, and sixteenth centuries respectively.

Probably a many of your readers could add to the list. The only one I know personally of the above, is that at Wareham. It is Norman, the upper part alone being of stamped lead work. It has a good Jacobean oak cover.—I am, &c., Harry Hems.

ST. ALBAN'S ABBEY.

Sir,—On a former occasion Mr. Chapple, when hardly pressed, did not consider it beneath him to meet my arguments merely by attempting to throw discredit on me professionally, and on the honesty of my regard for ancient remains. He did this by making some unprovoked, unjust, and wholly irrelevant sneers at a reredos which was put up by me some twenty years since at Boxgrove—a mere makeshift for the time being—as though it were intended as a permanent and worthy appurtenance to that grand old church when restored. In your last week's issue, whilst nominally and professedly accepting my challenge, he displays the unenviable discretion which, in some cases, is said to be the better part of valour, by giving as a correction of my section the section of something else to which it is only remotely related.

I find that by his persistent evasion of the real question, some of your readers are scarcely aware what the exact issue is, which may be stated thus: In the length of the nave clerestory, on the south side, there were three distinct divisions of corbel-table, each one coextensive and corresponding with the several periods of work in the bays beneath. That in the five western bays had simply moulded corbels. The middle bays had principally heads more or less grotesque. The three eastern bays had a corbel-table constructed of old Roman tiles (the others being principally of clunch stone), with stone corbels, very simply moulded and cut, much decayed, and, consequently, not well defined in their form, with a distant likeness to those over the western bays. I arrived at a conclusion that the old corbel-table surmounting the undisturbed Norman work of the eastern bays was original, of Late Norman date, forming the eaves-course of the original roof. Other architects and antiquaries had expressed themselves puzzled by it, but had set it down as unquestionably *mediæval*, without assuming to suggest its exact date. Mr. Chapple informs us that it was wholly modern, constructed within the last 50 years, and attempts to prove his case, not by analysis and reason, but by ridicule, assertion, and a little harmless vituperation. He actually evades the very points at issue, and sets up a dummy which he forthwith proceeds to knock down. He says nothing as to the assertion which he at first made of the corbel-table having been built upon the top of a wall raised 5ft. 6in. in Mediæval rubble-work. He gives a detail of a corbel-table, without any intimation as to its position in the length or breadth of the building. The detail which he gives is that of the unquestioned Mediæval one, and *not* that of the three eastern bays, of which alone I have all along spoken. He then refers me to Carter's plates as showing these eastern bays to have had in Carter's time a clunch stone corbel-table, like that of which he gives a section in your columns, in order to suggest that it had been rebuilt since Carter's time in 1810. But Carter's plate shows nothing of the kind. It gives no indication of difference between the brickwork and stonework generally. It does give, however, some wavy lines below the corbel-table, to indicate the junction of the work of the Norman period with that of the Mediæval. I hope you will be able to allow me a small space for the illustration of this (see sketch). The corbel-table of which I gave a section, and which has been destroyed, is clearly the one indicated by Carter. In the letter-press the battlements (or parapets) are spoken of as in recent brickwork; but that this does not apply to the corbel-table is evident from the fact that in a detail given of the Mediæval portion of the corbel-table he indicates what he calls the recent work, *i.e.*, above the corbel-table, by leaving it plain. He gives us detail of these three eastern bays; and Mr. Chapple's detail was taken neither from Carter's illustration, nor yet from this portion of the building at all. He has not touched the real point, except as to the thinness of the mortar-joints. And even here he has prudently refrained from calling attention to the fact that the mortar joints—and, indeed, the whole work in the Later Norman walling generally, and not only in this corbel-table—were thinner and finer than those in the tower. I deny that these had either the thinness or the character of the modern brickwork, and the construction and character of the work of the parapet were quite different to that of the corbel-table beneath it. It is impossible for them to have been built at the same period. And it is quite clear that the corbel-table to which I have all along referred (of whatsoever period it may have been) was not put up within the present century. The only opinion which I have heard expressed (except by Mr. Chapple) has been that it was *Mediæval*, and probably almost coeval with the western bays. I cannot accept this as a solution, any more than Mr. Chapple would be disposed to do so. He professes to correct my detail, but gives something else instead. Portions of the corbel-table of the five western bays, of undoubted Early Mediæval work, were made up of scraps of Roman tile, and roofing tile, and anything that came to hand, such as Mr. Chapple described, and it followed to some extent the design of these three eastern bays, except that they used such of the old dèbris as was available; whereas in the eastern part the old Roman tile, not having been displaced or destroyed, was merely repaired, and surmounted with a stone string.



Surely I am fully justified in venturing to record the interesting nature of its construction, and to deplore its demolition as something worse than unnecessary? As mayor of the borough in which this grand old building is located, Mr. Chapple may not think it beneath him to give a little more *critical* consideration to the history of this work specially under his care. He may still merely continue to ridicule my discovery of an "original Norman cornice"; but, in any case, your readers will agree that it is he, not I, who has " found the 'mare's' nest."—I am, &c.,

William White, F.S.A.

Wimpole-street.

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Mr. John Price, engineer to the Barton rural sanitary authority, has been lately elected an Associate Member of the Institution of Civil Engineers.

Intercommunication.

QUESTIONS.

[5974.]—**Cleaning Stonework.**—Will you kindly inform a subscriber in your next number, in "Intercommunication," the best plan of cleaning stonework that has gone black, and oblige?—A Subscriber.

[5975.]—**Public Baths.**—In estimating for public swimming baths, from the area of the ground built upon, I should be glad if any of your readers would kindly inform me what is the approximate average cost per square yard, excluding the price of the land. Any cited examples and prices would be appreciated.—Bather.

[5976.]—**Contract and Rise in Prices.**—Where a job is let in separate contracts for the different trades, and the works are delayed by the fault of one of the contractors, can the other contractors recover any loss they may sustain (by rise in prices or otherwise) from the one causing the delay, or from the proprietor, or from both? —Mirsky.

[5977.]—**Clay-Grinding and Brick-Making Machinery.**—I have watched for answer to the above question by "M. R." with some considerable interest, but have not yet seen a satisfactory reply. I have a small brick-works in Monmouthshire, and have spent a great deal in machinery all in vain. Will some reader used to the strong plastic blue clay inform me of the best brick machine for the same, one that will make 8,000 to 12,000 per day?—Newport.

[5978.]—**Model Farm Buildings.**—Will some of your readers kindly inform me where there are model farm buildings with the latest improvements, erected in Northumberland and Scotland?—Improvement.

[5979.]—**Concrete Brick-Making Machines.**—I shall be glad if any of your readers can give me information as to above. Also as to quality of bricks, &c., made, and if of lime or cement concrete.—An Architect and Surveyor.

REPLIES.

[5950.]—**Stable Floor.**—Mr. T. E. Julian, in your issue of 28th, now recommends "granite cubes as a stable paving, and says they will wear." That they certainly will, but they become dangerously slippery in a very short time, which Buckley bricks, owing to their peculiar gritty nature, never do. He says "Buckley bricks are not used in London." There I am entirely at issue with him, as I know London to be a very large market for them, and in proof of the correctness of my statement I enclose for your information an order received on Saturday last by the Buckley Brick Co., from a well-known London stable-fitting house. The stables at Eaton Hall were laid some 30 years ago with Buckley bricks, which are to-day practically as good as the day they were put there, and the Buckley Brick Co. are now supplying bricks of a similar size (7in. × 4in. × 1⅝in.) and quality for the additional stables now being built from the plans of Mr. A. Waterhouse. For paving footwalks in towns their metalline is largely used, and I know that the borough surveyor of a large town has pulled up a cement stable floor because it had become slippery, and is putting down Buckley Brick Co.'s bricks instead of it.—Corcyra.

[5950.]—**Stable Floor.**—In reply to "Alpha's" enquiry as to the best material for stable floors, I agree with Mr. Veysey that Dutch clinkers are good, but you cannot get the best in England. Several sorts are made in Holland, and the really good ones are too expensive to export. The English Adamantine clinker is equal in hardness to the best Dutch, and is much truer in shape, and of a brighter colour. It is the best, in my opinion, especially if chamfered, for stable passages, but for the standings I have never seen anything to equal the patent brick of the St. Pancras Iron Work Co., made of the Buckley clay. They have no cross grooves to catch dirt or wet, and yet give a thorough good foothold. Their paving at the Windsor Castle stables is worth seeing. Asphalte and cement are bad; they are slippery, have a bad colour, and often fail.—A. P. S.

[5956.]—**Deflecting Ventilators.**—As "W. F." has so well replied to "J. R.'s" query, I need not say what I intended. The term "deflecting" I have generally applied to all those ventilators which act by the use of deflecting plates placed at certain angles, and which, by deflecting the currents of air, produce a partial vacuum. "W. F." describes the kind of ventilator in which the plates are placed vertically; but there are other methods, in which the deflectors are horizontally fixed. Messrs. Boyle and Son's air pump ventilators are very cleverly contrived to regulate the currents and prevent a down-draught, and I do not think architects could possibly adopt a better sort of outlet. There is only one fault I have to find with them, and that is their external design is not dictated by considerations that should control all these matters—I mean fitness. The ventilators are often made to assume elaborate forms, such as turrets, cupolas, pinnacles, fleche-like features, instead of being designed with reference to the principle of fitness. Architects who are particular about these things would rather have the plain undisguised ventilator without elaborate casings. A plain cylindrical shaft, with conical covering, seems to answer the purpose and express the ventilator in the least distasteful manner.—G. H. G.

[5959.]—**Brown Ink.**—What the querist requires is known as "indelible brown ink." Most of the colour-manufacturers make it. As regards his drawing, I beg to say he ought to perfectly ink it in before commencing colouring. If he does not, how can he clean off? In cleaning off it is well to use bread-crumb, so as not to impair surface of the paper. If the paper is much rubbed, the colouring will be dead and spiritless. The indelible, if well dried, will stand colouring well, but towards the end of the bottle it is apt to get cloggy in pen. A good fluid drawing-ink which will stand washing and not clog pen has yet to be found.—M.

[5969.]—**Burning Beech.**—In reply to Lord Radnor, beech-wood has been used for the fire for the last 40 years in the Duchess of Sutherland's sitting-room, Trentham Hall. We never found any secretion as mentioned in your question. The flue is clear and all right.—T. Roberts, Surveyor, Trentham Hall.

[5970.]—**Sound through Party-Walls.**—I am sorry I cannot recommend anything that will entirely remedy the passage of sound "Materfamilias" complains of, as the evil resides, no doubt, in the floor timbers which adjoin on each side of the party wall, and convey the sound from house to house. As a palliative, she might try what battening will do, the space being filled with sawdust, felt, or any other non-conducting materials. Even canvas laid on battens fixed to the wall, and then papered would reduce the sound, and would not occupy much space in the room. If the room is on the ground-floor and there is no basement, something more effective may be done to mitigate the nuisance by taking up the floor-board next the party wall, cutting off the ends of all the joists so that they should just be clear of the wall, and building a sleeper wall or inserting a bearer to carry them. If the ground level is not far below the floor, this might easily be done without much trouble. No doubt the sound is conducted at the floor, and probably the wall is not so well bonded or flushed with mortar as it should be.—G. H. G.

[5971.]—**Builder's Charge for Plans.**—"W. W." can charge for the alterations approved by the Local Board as well as those ordered by employer, but as regards the amount of charge I cannot advise him. He had better do so according to the time he was employed, as he could not legally claim the usual architect's percentage, which would be 2½ per cent. for work not carried out. It is, indeed, a question with many whether a builder who carries out by contract the plans he has himself prepared can legally charge for the latter.—G. H. G.

[5972.]—**Varnish on Print.**—In reply to "I.P.C.'s" query, I have been very successful in removing old varnish from some very old and delicate etchings by placing them for a short time in methylated spirit. The etchings do not appear to have received the slightest injury.—C. E. Clayton.

[5973.]—**Taking Angles with Theodolite.**—In taking angles with this instrument the theodolite is fixed over the station, the zeros of the horizontal plates are set and clamped, and the telescope is directed to the staff or mark at the commencement of the line that has just been measured. The whole instrument is then clamped and the upper plate unclamped, and the telescope directed to the flag or mark of the line intended to be taken. The zero of the instrument should be always directed to the commencement of the old line.—G. H. G.

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LEGAL INTELLIGENCE.

The Skirlaugh Church Libel Case.—Botterill and Another v. Whytehead.—This case, tried again last week in the Exchequer Division before the Lord Chief Baron, and Mr. Justice Stephen, was an action of libel, and was tried before Lord Justice Bramwell, at the last Leeds Assizes, when the jury found a verdict for the plaintiffs—damages, £50. A rule was, however, granted to review this verdict on the grounds hereinafter stated. The action is brought by a firm of architects against the vicar of an adjoining parish—Nunkeeling, in Holderness—for two letters and a memorial imputing to the plaintiffs that they were unfitted to carry on the restoration of the ancient chapel of Skirlaugh. The letters were written to Mr. Bethell, the squire of the parish, and Mr. Barnes, the rector, both members of the restoration committee, and are set out below. The memorial was found by the jury not to have exceeded the privilege of comment on a matter of public interest; but the two letters were found to be libellous, with damages as above. In justification, the defendant pleaded that all the facts stated were true; but this was styled by Mr. Justice Stephen as "a timid justification." The case raises some interesting points on the law of libel and the vexed question of privileged communication—in this instance comment on the fitness of an architect to restore an old church. The following are the libels complained of:—"Nunkeeling Vicarage, Bewholme, Hull, April 8, 1878. Sir,—I see in the *Hull News* of Saturday that the restoration of Skirlaugh Chapel has fallen into the hands of an architect who is a Wesleyan and can show no experience in church work. Can you not do something to avert the irreparable loss which must be caused if any of the masonry of this ancient gem of art be ignorantly tampered with? Your great influence would surely have much weight in the matter.—I remain, yours truly, R. Y. Whytehead. W. F. Bethell, Esq., Rise Hall, Hull." "I am annoyed to see that you and your committee have engaged Messrs. Botterill as architects for the restoration of your church. Are you aware they are Wesleyans, and cannot have any religious acquaintance with such work? To Mr. Barnes." The rule was granted on the grounds that the verdict was against the weight of evidence; that the letters were written on a privileged occasion, not exceeded by the writer; that there was no evidence of express malice in the defendant, and the learned Judge ought to have directed a nonsuit or a verdict for the defendant; that the learned Judge did not sufficiently instruct the jury that the question for them was, not the fairness or unfairness of the letters in fact, but whether there was actual malice in the writer; and that the damages were excessive. The learned Lord Justice, in summing up, said,—"It is no imputation to say of a man that, although competent in his profession that he carries on generally, he is not a specialist in a particular branch which is not one of the ordinary branches of his profession;" also that "if the repairs of this church were of such a character that anyone fairly interested in them might properly address himself to those who had influence in determining how they should be carried out for the purpose of having them properly restored or preserved, it would have been perfectly legitimate so to do." Mr. Waddy, in showing cause, said the attempted justification set up by the defendant was, "I meant no such experience as in my opinion was requisite." At the trial the plaintiffs were prepared with ample evidence of capacity as architects; but as that was not really impugned, the Judge rejected it as irrelevant. The defendant, however, had given evidence by a side-wind to the contrary. Were the jury justified in finding the letters libels? that was the real question. Mr. Justice Stephen: If you were to say of an architect that he had no experience in building pyramids, would that be libellous? Mr. Waddy: No, for that would not be in the usual course of his business. But if you said of a tailor, "He cannot cut coats," it certainly would. The defendant says, "You mean to give him a job for which he is not fit, and as an architect he ought so to be; if you allow him to touch it, it will be ignorantly tampered with." Mr. Justice Stephen: I can see now there is a sense in which the jury might have found the letters libellous. But if the real meaning of them is only "Beware what you do," and the jury have misread it as an attack on personal skill, that would show that the verdict was against the weight of evidence. Mr. Waddy: The plaintiff, in cross-examination, said he had had but little experience in church architecture, though he had studied it all his life; he had repaired St. Mary's, Sculcoates, on the roof. But he had prepared designs for another church, and had built a great many Wesleyan schools and chapels. His plans for Skirlaugh, approved, with but trifling alterations, by Sir E. Beckett, were merely a copy of the old church: there was no new idea; he said he aimed at a faithful reproduction. After the defendant's memorial, the committee held their hand until after this action was determined. Clearly the letters are defamatory; they are an attack on the plaintiffs as architects, and not as Wesleyans. Where is the privilege claimed, which the learned Judge stretched far too much in the defendant's favour? The defendant's connection with Skirlaugh was of the most shadowy kind. He was not the rector, nor a churchwarden, nor a parishioner; one of his relatives was buried there, and he was born and had lived for some years there; he could only say he was a member of an archæological society. He was told by people that his fears about desecration were groundless, at all events before his memorial; that there was to be no alteration in the original structure. He admitted he had never seen the plans which he professed to wish to alter. The defendant admitted to me that he thought the work would be "ignorantly tampered with," by Messrs. Botterill, and that he said so, not from what he knew, but from what he heard from the other clergy. At the time the letters were written the plaintiffs had actually been retained by the committee, and they were written with the object of depriving them of their contract. As to the damages being excessive, that will hardly now be seriously contended; the only wonder was the jury, under the circumstances, gave so little. Mr. Seymour, in support, said the question was one of the plaintiffs' peculiar fitness to do a particular work. He drew attention to the animated discussions going on in the *Times* and elsewhere on the restoration of St. Alban's Abbey and the proposed defacement of St. Mark's, at Venice, and the free comments made on all hands on the matter. Mr. Justice Stephen.—The matter seems one which they cannot discuss with calmness; just like the classical languages, over which people invariably lose their tempers before long. Mr. Seymour proceeded to read a passage from Mr. Ruskin's "Seven Lamps of Architecture," p. 160, as embodying Mr. Whytehead's feelings on the subject; and Mr. Justice Stephen said—Suppose the geater part of the "Seven Lamps" had been written about living architects instead of Venice, cannot you imagine cases in which Mr. Ruskin would have been defendant?—Mr. Seymour pressed that the expression "no experience in church work" had been fully made out; certainly not such as would fit the plaintiff to undertake such a work as the restoration of this unique and interesting gem of Gothic art, which dated from somewhere like 1388. In 30 years' experience the plaintiffs had only put the roof on one Gothic church—St. Mary's, Sculcoates; but there was nothing of ancient Gothic about that. One of the defendant's witnesses had styled it "poor modern Gothic." The plaintiff said he had prepared plans for a tower at Flamborough Church for Mr. Wilkinson; but no such tower had ever been built, and it turned out that he had merely looked over the designs of another architect. Moreover, the vicar of St. Mary's, Sculcoates, Mr. Pearson, had signed the defendant's memorial deprecating the desecration of Skirlaugh, along with the Dean of York, the Archdeacon of Cleveland, and 38 other persons interested in old art. Were they all to be deemed libellers? As to the plaintiff's plans, the architects called by the defendant all condemned them—Mr. Fowler, Mr. Broderick, Mr. Morris, Mr. Gilbert Scott, and Sir Henry Dryden. They said the spirit of the work would be destroyed, and its value as an historical building entirely gone, if his plans were followed. All this showed the defendant was zealously and properly anxious that the work should fall into the hands of one who had studied deeply in the ancient school and was attached to it. The learned counsel produced a copy of Pugin's "Contrasts," where the examples taken of modern bad taste and ancient art are St. Pancras Church and Skirlaugh Chapel. Mr. Botterill, however, said he had never seen Pugin's "Contrasts"—rather a startling admission; but his chief work had evidently been houses and Methodist chapels and schools. No actual malice had been proved against Mr. Whytehead. He himself swore he was actuated by no ill-feeling towards Wesleyans in general or the plaintiffs in particular, but had acted on what he heard at a clerical meeting; and his lordship said if he had acted on what he had heard and *bonâ fide* believed, that would be enough to justify the defendant. This was a difficult issue to win for the Church of England before a jury in one of the Northern commercial centres when once the red flag of Wesleyanism was unfurled before their eyes. No sensational letter was written by the defendant to any newspaper, the *Builder*, any Church paper, or even the *Hull News*. He wrote to people he knew and to friends, not with any reckless disregard for Mr. Botterill's character. He thought it would have been better to have employed one whose qualification was beyond suspicion. It was clear that the defendant had no personal malice, and the plaintiffs must prove that actual malice existed. —Mr. Justice Stephen: Malice is an unfortunate word; but we must take it as we find it. I should have thought, had not the law said otherwise, that the motives that influence one man in blaming another were quite immaterial. The question is, What injury, if any, has the man sustained?—Mr. Seymour proceeded to quote a series of authorities on libel—"Wright v. Woodgate," C. M.R.; "Woodward v. Lauder," "Somerville v. Hawkins," "Coxhead v. Richards," "Whiteley v. Adams," and "Clark v. Molyneux." The Lord Justice had nowhere expressly told the jury, as he should, following his judgment in the last case, that they were bound to find actual malice in the defendant in order to find a verdict against him, and that the onus of satisfying them on this point lay on the plaintiffs, as the occasion was a privileged one. The mere absence of *bonâ fides* is not actual malice, it being held in "Clark v. Molyneux," that where a privilege exists, if a man honestly believes what he says, the question whether that belief is reasonable or not will not arise, or if answered in the negative will not destroy the privilege. Surely these expressions are consistent with an honest belief; the defendant says he used the word "Wesleyan" as explaining the want of experience in the plaintiffs; pointing to a different habit of thought, tone of mind, and field of labour. If the matter be one of public interest, or the defendant write in an honest, though mistaken, sense of duty, that creates a privilege; the plaintiffs are bound to prove actual malice—that is, in the popular sense of spite, hatred, or enmity. If the language does not exceed what the occasion fairly requires, anything written in ignorance. rashness, or bad taste would not do; and the burden of proving this malice, which amounts to some motive morally discreditable, lies on the plaintiffs, who have failed to make it out here. His lordship ought to have non-suited the plaintiffs at the end of their case; for Mr. Botterill admitted he had had no experience in restoring ancient churches. His Lordship spoke of Jupiter and Juno; but I can well fancy a person unacquainted with Greek mythology, asked to restore a Greek temple, posing wrongly the thunderbolts of Jove, and grouping incorrectly the peacocks round the throne of Juno.—Mr. Justice Stephen: Suppose a Mahomedan were asked to restore a Greek temple, you would say "your religion absolutely forbids you to depict the human form; but here is a place to be filled with statues."—Mr. Seymour: Precisely so. To support the verdict, the jury ought to have found actual malice in fact. Lastly, it is never pretended that the plaintiffs suffered a farthing's worth of damage. Mr. C. Dodd followed on the same side, contending that the preservation of our ancient monuments was a matter of interest to a vast body of persons; therefore the discussion of the subject was covered by privilege. Here there had been no publication to any one beyond the circle of those immediately interested; the intended publication was owing to the plaintiffs having brought this action. The verdict was given on both letters, and if the Court thought there ought to be a distinction in the new trial they would say so. But if this privilege were not supported, there would be an end to the free discussion of the means of preserving or restoring our ancient monuments.—The Lord Chief Baron: This case has been elaborately argued; and, as the case may be said to have some peculiar circumstances in it, we will take time to consider our judgment.

Our Office Table.

Sir William Boxall, whose death, at the ripe age of 80, occurred on Saturday morning last, though eminent as one of the best portrait-painters of his day, will chiefly be remembered as Director of the National Gallery, to which important post he was appointed in 1865 as successor to the late Sir Charles Eastlake, P.R.A., resigning it in 1874 in consequence of failing health. His acquirements in the study of the great examples of the works of the Old Masters, which from early life had been his favourite pursuit, were well-known, and to these he had added other qualifications in that literary culture and good taste which, united with a genial sincerity and high integrity, won for him the warmest esteem and respect of all with whom he associated. It was these qualities, besides the distinction he had obtained throughout his long life, that led to his receiving the honour of knighthood when he was Director of the National Gallery, and more recently (in 1870) the honorary degree of D.C.L. from the University of Oxford. Like so many artists and not a few men of letters who have risen to their high place, Sir William Boxall was entirely a self-made man. He was born on the 29th of June, 1800.

Knud Baade, Swedish Court-painter, and member of the Academy of Arts at Stockholm, died on November 24th, at Munich, where he had been domiciled for the last thirty-seven years. In him the artist fraternity of the Bavarian capital has lost one of its ablest and most estimable members. He was born in 1808 in a rural district of South Norway, and received his first artistic instruction at the Academy of Copenhagen, when nineteen years old. After four years spent in diligent study he returned to join his family, who had meantime settled in the district of Bergen. The grandeur of the natural scenery which perpetually met his eye seems to have most powerfully and permanently impressed his imagination. In 1836 he met his countryman, Dahl, the landscape-painter, who was on a visit to Bergen, and, by his advice, he went to Dresden, where he studied for three years. He returned to Norway for about two years, which were chiefly devoted to making sketches, to be afterwards worked up into pictures. In 1842 he settled in Munich, and began his settled career as a painter. For the last twenty years of his life his health was very feeble, but he was, nevertheless, a diligent worker.

The Local Board of Health of the City of Ely seems to have peculiar notions as to the nature of the trust imposed on it by the ratepayers. According to the *Cambridge Independent Press*, a special meeting of this body was held on Monday week for the purpose of selecting a local surveyor; the salary offered was £120 per annum. The reading of the testimonials occupied two hours, and this done, the number of candidates was reduced to eight. The field having thus been cleared, a member remarked that two courses were open to the board—one was whether they should simply consider those applicants who were furnished with testimonials, or whether they should take into consideration the application of Mr. George Harlock (one of the eight), who had no testimonials, but whose candidature might be thought necessary on local grounds. To this Canon Bulstrode replied that "local considerations should be sufficient to place Mr. George Harlock before the board as a desirable candidate, especially when the fact was considered that this candidate's father (Mr. W. Harlock) had sat for so many years as a member of the board in the interests of the ratepayers." Another member, still more candid, admitted that if it were a question of testimonials, Mr. Harlock would not be selected, but he had been educated as an engineer, and his father had been a surveyor in Ely for many years. Canon Bulstrode having proposed the election of Mr. Harlock, Mr. A. Hall requested to know why the board advertised for a candidate if it were intended to accept Mr. Harlock, who probably had only a knowledge of locomotive engines. By electing him the board would place themselves in an invidious position. Eventually it was agreed to propose the appointment subject to confirmation at the end of six months, and, the motion being put, was carried by seven votes to three, the claims of the other candidates not being gone into. When the numbers were announced Mr. W. Harlock, who had sat out the discussion and had voted with the majority, returned thanks on his son's behalf for the confidence reposed in his *family!* A professional correspondent who sends us the report, and informs us that he was not a competitor, comments strongly on the affair, and asks, "What inducement is there for men to study hard or to pass such examinations as that of the Sanitary Institute when such jobs as these are perpetrated?"

The business carried on by Messrs. Alexander Macphail and Co., at 211, Upper Thames-street, has been transferred to "The Co-Operative Foundry and Builders' Supply and Advance Association, Limited," who will carry on the business at 219, Upper Thames-street. This Association has been formed to supply materials, advances, and land combined, and to avoid the unfortunate failures so often brought about by the want of co-operation and confidence with the builder during times of depression, and the sudden introduction into the market of half-finished property, through inefficient and unreliable agents, who make excessive charges for their services, put estates to unnecessary expense, and perform their duties unsatisfactorily, and who have no interest compatible with what is proposed by this Association, viz., to avoid forced sales. The Association proposes to assist builders on the Company's own, or on the shareholders' estates, with temporary and permanent advances, and furnish all materials by special contract, thus securing to builders exceptional advantages and co-operation. The Supply Department is open to all customers in the trade.

The new Temple of our Saviour, at Moscow, commenced so far back as 1833, was designed in commemoration of the French expulsion from Moscow. The architect promises its completion next August, in readiness for the celebration of the 25th anniversary of the Emperor's coronation. The height of the structure, according to the *Globe*, is 288ft., and the style is Russo-Byzantine, the building being in the shape of a Greek cross, surmounted by five cupolas, one at each corner, and a larger one, or dome, in the centre. The roof and the framework of the cupolas weigh 1,800 tons, and the gilding on the latter has already consumed more than half a ton of gold-leaf. Above the centre cupola is a massive bronze cross, which can be seen from every part of Moscow. The bronze frames of the windows, each 9 yards high, weigh nearly 3 tons, and the hinges of the bronze doors have to support $5\frac{1}{4}$ tons of metal. Inside, the walls are gorgeously decorated in the usual style of Russian churches, and contain a number of jasper pillars, each of which cost upwards of £2,000. The total cost is estimated to exceed 20,000,000 roubles, or £2,500,000.

We are glad to find that Featherstone's architectural drawing ink, which we have twice previously noticed, has been taken up by Messrs. Webster and Co., of Mansion-house Chambers, and no difficulty need now be experienced in procuring it. This will answer many communications which have reached us during the past two months in consequence of the remarks we published in August last. A sample of the ink, as now made, has been sent us, and it is in all respects excellent. Mr. Featherstone seems to have turned his attention to inks generally with admirable results. Messrs. Webster send samples of an "indelible bank ink," "a copying ink," a "maroon black writing ink," and a "solid soluble ink" which we have tried. The bank ink is stated to be perfectly irremovable, the usual methods for removing ink serving only to intensify its colour, while indicating unmistakably that an attempt has been made to remove it. The copying ink is capable of yielding copies at any time, while the maroon black ink is an excellent writing fluid, turning black as it dries, and running freely from the pen. The "solid ink" is a capital preparation for the use of travellers, a very small piece, with the addition of water, making a bottleful of good free-running ink in a minute. Not the least merit of these inks is that they are non-corrosive—steel pens being apparently unaffected by them.

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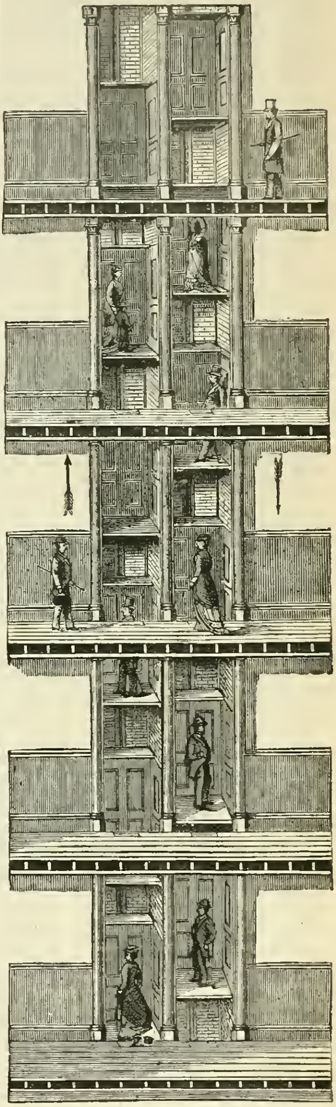

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On the 1st inst. died Professor Frans Ittenbach, one of the veterans of the Dusseldorf school of painters. Born at Kœnigswinter, in 1813, he entered as a pupil the Academy of Dusseldorf, where he has since passed most of his life. With his master, the celebrated Schadow, he visited Italy in 1839, and subsequently stayed for a time in Munich; but his experiences on this tour did not produce any appreciable effect on the branch of art to which he had already devoted himself. He belonged to the Catholic ecclesiastical painters, and was an important member of this group of the Dusseldorf school. His chief works are pictures of saints, virgins, and other religious and Scriptural subjects, and are scattered about in various churches of Germany and Austria. Besides receiving the professorial title from the Prussian Government, he was made an honorary member of the Vienna Academy, and knight of many orders by various Continental Sovereigns.

We referred last week to a statement made by a correspondent of the *Standard* with regard to St. Bartholomew's, Smithfield, to the effect that an official connected therewith has expressed his intention of selling the fabric. The Vestry Clerk now writes that the expression referred to was uttered in reference to circumstances prior to the partial restorations, which cost nearly £7,000, about eleven years ago. The inhabitants of the parish, we are glad to hear, are interested in the well-being of the church, and are anxious both to keep it in good repair and look forward to its restoration. The proposed restorations embrace the rebuilding of the apse, &c., which involves the purchase of valuable property adjoining, the rebuilding of the north transept, requiring another large purchase—in fact, very little can be done outside the walls without purchases of property abutting thereto. Drawings of these proposals may be seen at the church, as prepared by Mr. Hayter Lewis and Mr. Slater. The immediate object under consideration is to keep it water-tight and in fair repair for services, and the churchwardens are seeking assistance to enable them to do so.

Mr. B. Kitt, C.E., the resident gas-engineer of the Bristol Urban Sanitary Authority, having now perfected his system of street-lighting, the corporation of the city has adopted it, and it is now permanently applied to the whole length of one of the most important thoroughfares—Victoria-street, leading from the railway terminus to the centre of the city. Concave mirrors or reflectors are placed between two gas-jets, used instead of a single jet of an ordinary street-lamp. Some are made of block tin, and others of glass, which requires no cleaning. Originally the mirrors were suspended from the top of the lamp; but, as it was found in these circumstances exceedingly difficult to focus the light, Mr. Kitt now has the mirrors and burners made in one fixture, which is screwed on to the gas-pipe, above which there is an adjusting screw by which the mirrors can be brought to the exact focus in each particular lamp. When this perfect focus is obtained, the light reflected on either side of the street-lamp is brilliant compared with that from the jet ordinarily in use, while the consumption of gas is not greater than that of the single jet formerly used. A good light is also sent across the road as well as on the footpath.

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CHIPS.

The jury appointed to examine the works of the various competitors for the prize of 25,000fr. offered by the King of the Belgians for the best architectural treatise, have reported that no production of sufficient merit has been submitted to them. Two out of the seven jurors were, however, in favour of awarding the prize to a study on the Church of Villers by MM. van Bemmel and Coulon.

It seems to have become the fashion to send representatives to funerals of other people, solemnised a good while after one's own death—at least, *The Times* of Friday last, in its report of Mr. Roebuck's funeral, at Bushey, says:—"Mr. Chapple (of St. Alban's) represented Sir Gilbert Scott."

Mr. Cross, having duly approved of plans for police-stations at Polmadie, and Kilbarchaw, the police committee of the county of Renfrew have instructed Mr. Davidson, their architect, to take estimates for, and proceed with, the erection of the buildings as early as possible.

The death occurred, on the 5th inst., at his residence, 7, West-parade, Anlaby-road, of typhoid fever, of Mr. William Henry Botterill, aged 27, only surviving son of Mr. William Botterill, of Hull, and junior member of the firm of William Botterill and Son.

Messrs. Henry Poole and Sons, marble and stone masons and quarry owners, of Millbank, and of Ipplepen, in the county of Devon, have presented a petition for liquidation. Mr. G. A. Cape, accountant, Old Jewry, is appointed receiver of the estate. The debts are estimated at about £12,000, part of the amount being secured, and the assets comprise stock-in-trade, machinery, and a large amount of book debts.

The obelisk which has for about nineteen centuries stood opposite the Temple of Augustus, at Alexandria, was on Saturday successfully lowered to the ground, prior to removal to America.

At the instance of the Goldsmiths' Company an important improvement has been effected on the south side of Cheapside, near the cathedral extremity. The leases of Nos. 23 to 27 having expired, larger and more expensively-treated buildings have been erected on the site. The new structures contain six stories, and are 72ft. in height, with a frontage of 101ft. and a depth of 103ft. They are built of brick, with a Portland-stone facing to Cheapside, polished granite pilasters being introduced into the ground-floor front. Messrs. Ford and Hesketh were the architects, and Mr. Lawrence was the builder.

The parish-church of Woodham Walter, near Maldou, Essex, was recently reopened after restoration. In the chancel the plastered ceiling has been removed, exposing the old oak rafters, and at the east end has been placed a three-light window, filled with stained glass, representing six Scriptural types and antitypes, by Messrs. Ward and Hughes, of Frith-street, Soho. The windows, both in nave and chancel, have been restored in stonework, the nave-roof rafters opened out, and the west tower reshingled. Some fragments of stained glass, belonging to the older church, taken down in 1562, have been reinserted in the lights.

At a vestry meeting of St. Katherine Cree's, City, held on Tuesday week, it was decided to erect a school building for the benefice in the churchyard, in accordance with plans prepared by Mr. R. R. Notley. The school is to accommodate 300 children, and the estimated cost is £1,050, exclusive of fittings.

Nearly 30 years since it was decided to add a tower to the old church at Bootle, but after being carried up 40ft. the work was stopped for want of money. The undertaking has just been completed by subscription. Mr. Grundy, of Ulverston, was the architect; and Mr. Bradley, of Millom, the contractor.

The corner-stone of the new elementary schools at St. Anne's-on-the-Sea, Lytham, was laid on Thursday, the 4th inst. The schools are of Early Gothic design, will accommodate 200 children, and cost about £1,400. Messrs. Longworth and Gardner, of Preston, are the architects.

The tender of Messrs. Stephens and Bastow, builders and contractors, Bristol, has been accepted at £76,499, for the completion of New Court, in Serle-street, Lincoln's-inn, London, by the erection of the north side and east and west wings of the quadrangle. The architect is Mr. A. Waterhouse, 20, New Cavendish-street, Portland-place, London, and the quantities were prepared by Mr. S. M. Rickman, Montague-street, Russel-square, London.

The Brighton town council decided on Wednesday week to replace the wooden fence with a new one in iron, to extend along the whole length of the sea-front from Lewes-crescent to Cannon-street. The estimated cost is £15,700.

The distribution of prizes and certificates to the successful students in the science and art schools at Torquay, was made on Friday week, by the Countess of Kinnoull.

Lamplough's Pyretic Saline is Refreshing, most agreeable, and the preventive of Fevers, Biliousness, smallpox, skin diseases, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[Advt.]

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MEETINGS FOR THE ENSUING WEEK.

Monday.—Royal Institute of British Architects. Memorial sketch of the late F. P. Cockerell, at 8 p.m., and at 9 p.m. a special general meeting of members only, to consider revision of by-law 34.
Society of Arts. Dr. Graham's 4th Cantor Lecture on "The Chemistry of Bread and Breadmaking," 8 p.m.
Wednesday.—Society of Arts. Captain Bedford Pim, M.P., on "The Panama Canal," 8 p.m.
Friday.—Architectural Association. Paper by Cole A. Adams on "Common Sense in Architecture," 7.30 p.m.

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THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 19, 1879.

ROYAL ACADEMY PRIZE DRAWINGS AND SCULPTURE.

LAST week we reviewed the architectural works by students of the Royal Academy, and we now take up the prize subjects in painting, drawing, and composition in sculpture. If the architectural drawings have been unusually good, it must be generally admitted that the other competitions have been not less distinguished for merit. The historical subject given this year was "The Pool of Bethesda," a theme demanding so much power in composition, that it would hardly be fair to the competitors to say that the studies are not up to the mark, if they disappoint us in point of conception. The composition by M. H. H. Le Thangue, of Dulwich, to whom the gold medal was awarded, is without doubt distinguished for grasp of subject, balance, dignified treatment of the figures, and a subdued tone in harmony with the theme. We are obliged to say, however, that the figures lack scale: the figure of Christ standing on the steps of the pool lacks the size and prominence we expect to find in the central subject; the archway and wall, and accessories of the picture, are rather overpowering; the pool itself is hardly pronounced enough, while the attitude of the Saviour is scarcely dignified as he makes a sign with his hand to the lame man, the soles of whose feet are both turned towards the pool. The drapery also of the Saviour is rather stiff. In some other respects, as in the foreshortening of the man's legs, we may suggest improvement; but the grouping of the figures on the right side and the low tone of colouring are very creditable. Some of the other competitors have lost all regard for simplicity in their arrangement: their figures are crowded, or are drawn with too stern reality, and we become more conscious of the labour of the artist than the impression sought to be conveyed; nevertheless, there are one or two studies of this subject which very closely compete with M. de Thangue's. For landscape Mr. Henry Gibbs takes the Turner Gold Medal. The subject is an "Ocean Coast," but Mr. Gibbs gives us more of a bay of some inland sea. It is true there is a rocky coast; but the sea is comparatively calm, and the figure of a girl descending a pathway in the foreground destroys the illusion. The painting of the verdure-clad cliffs and general handling are certainly clever, and there is undoubted evidence that Mr. Gibbs will make a mark in landscape. Though we cannot overlook obvious faults in the drawing of Mr. G. Frank Miles' rendering of the same subject, it is satisfactory to find the judges have awarded his picture an extra silver medal. It is forcible, boldly conceived, and surpasses in technical painting the gold-medal picture, the grand perspective of the retiring billow as it sweeps the coast, its foaming hollow and the transparent colouring of the wave-crest are masterly pieces of execution. No. 5 is boldly treated; No. 3 has an angry chopping sea curled into the most fantastic and unmeaning forms; No. 10 is spoilt by the laboured treatment of the rocks, while No. 12 has a sea of the most unnatural green. It is instructive to notice the very different conceptions of this subject, some of them tranquil scenes, others grotesquely wild.

The prize for the figure from life has been ably contested by several students: Mr. C. Knighton Warren takes the silver medal for a study of man with scythe. The drawing of the back and arm is anatomically faultless; the muscles are drawn with care, and light and shade and flesh-tinting are excellent. The artist has conveyed skilfully the idea of movement; the man looks really engaged in the act of mowing, not standing still. The same student wins the first silver medal for a vigorous drawing of figure from life exhibiting accuracy in outline, light and shade; the muscular development is well shown, and there is symmetry and grace in the attitude of figure, which some of the competitors for this prize have lost sight of. It was not necessary to have drawn the figure sideways, as some have done, and Mr. Warren has avoided this by presenting more of the back and shoulders of the standing model. Mr. Sydney J. Hayes, who wins the second medal, shows himself also a master of figure drawing. Mr. Manning Griffenhagen takes the £10 prize for painting from life, with a creditable work. Miss Edith Savill who obtains the medal for drawing of head from life, has certainly displayed considerable skill, the features, light and shade, and expression, are strictly true to nature; in the same class we observe many very creditable performances. As usual, the crayon drawings from the antique are very numerous, both of heads and from the figure. Miss Mary Dealy wins the second medal for the first and the £10 premium for the second subject. We cannot admire her drawing of a man with a child in his arms. The pose of the figure leaning is not strictly correct, as the arm resting on the post would throw the shoulder on that side out of the level. Her drawing of the Laocoön is better and the work generally in this class is equal, to that of previous years.

Passing to the sculpture we observe a remarkable advance. The leading work of the year is Mr. Thomas Sterling Lee's group the "Discovery of the dead body of Abel, by Adam and Eve." In this composition, for which the travelling studentship has been awarded, it must be admitted the artist has seized, in a very happy manner, the chief points of his theme, and has put a thoroughly human interest in his work. The three figures are admirably grouped, while a pleasing balance is observed in the composition. Adam, on one knee, has raised the dead body of Abel upon the other, with a countenance of mingled amazement and horror, and is eagerly looking into the closely-fixed eyes of his son. Eve stands at the side holding one of the inanimate arms, and is looking also into his face with bewildered surprise and dread. The artist has cleverly conveyed the expression of astonishment with which our first parents may be supposed to have looked upon death. The body of Abel is modelled with all the rigidity characteristic of that state, while the artist has not obtruded any of its more repulsive features—the body as it lies across the father's knee is bent, and the ribs and the intercostal muscles are prominently modelled; this part is the only point of the work where the artist might have done better if he had been a little less realistic. Mr. Lee has at least in this work exhibited a closer rendering of nature in its details than might be warranted, but if his work fails as an ideal abstraction of sculpture, it must be acknowledged that he has given us a group that at once rivets the attention of the beholder, and excites his emotion. Mr. Lee is the son of Mr. John S. Lee, surveyor, of Craven-street, and from the undoubted ability he has shown in this group we may, we trust, venture to predict for him a brilliant career in the profession he has adopted. The gold medal has been won by Mr. F. Collcutt, with a group representing "Venus rescuing Æneas from Diomede." It is a skilfully composed, idealised group well balanced. The artist, who has taken the Homeric story, shows the Trojan warrior wounded, and Venus in the act of protecting him from the shafts of Diomede. The figures are gracefully modelled, and the artist has caught the true classical spirit in his composition. It is somewhat amusing to compare this work with others submitted for the same subject. In group No. 2, though ability is shown, there is a too laboured rendering, and a want of simplicity in the conception. Another idea is very commonplace—Venus, Æneas, and Diomede, are placed in a row, and the former interposes her hand to save her son. There is a decided want of grouping in the piece, and the position of the figures and spear show an equal lack of conceptive power. Mr. David John Wade wins the silver medal for a statue of a man untying his shoes. The figure is skilfully modelled.

The Armitage prize for a time sketch in oil has been ably contended for: the subject selected was "Bringing sick persons to the Temple of Æsculapius," a theme that was well adapted to bring out the qualities of composition and grouping. The first prize has been given to Mr. Marcus H. Smythson, and the second to Mr. T. Hill. Mr. Smythson's composition is certainly clever in arrangement; the divinity is shown surrounded by the peristyle of a temple, and the grove beyond and the figures of the sick are brought up in reverential manner. There is a pleasing allusion in the half-concealed statue of Æsculapius with the serpent, and the chiaroscuro is effectively managed. Mr. Hill's sketch is also particularly bold in light and shadow; an invalid is being carried before the altar, and a breadth of treatment characterises the design. We notice one or two other clever compositions especially Nos. 17, 19. There is the usual fault in many of the attempts of overcrowded and badly arranged groups aud laboured effects of light and shade.

We must not omit a word of praise for the very interesting series of sketches exhibited by the architectural Travelling Students. Mr. T. Emlyn White's drawings, made during 1878, display a large amount of careful sketching. We note as especially interesting the sketches from the Bargillo, Florence, from Seville Cathedral, from Ravenna, also some elaborate coloured details from St. Frari, Venice, and the upper church of San Francisco at Assisi, in the latter of which the artist has recalled with much feeling that beautiful example of thirteenth century work. Drawings and details from the Palazzo Ducale, Venice, and coloured decoration from Palermo, are also among the collection, and Mr. White appears to have spent his time profitably among some of the choicest examples. The studies also of Mr. T. M. Deane, made during 1877, show a few choice bits of colour decoration; the painted glass and mosaics are very good.

TERRA-COTTA ARCHITECTURE.

THE removal of the last traces of scaffolding from Mr. Waterhouse's magnificent Museum at South Kensington, seems a fitting occasion for a few observations upon the use of terra-cotta, considered more especially as a London building material. We have often discussed its peculiar fitness for London work, and pointed out the special features upon which its claims for employment in such a smoky and destructive atmosphere as ours is, are based, and we early drew attention to its many excellent qualities. Messrs. Gibbs and Canning, of Tamworth, who have carried out the whole of the terra-cotta work for the New Natural History Museum, deserve the most prominent notice for the thoroughly satisfactory manner in which they have overcome all difficulties in the manufacture, and have seconded the views of Mr. Waterhouse, who may be regarded as the most enthusiastic advocate we possess for the use of this comparatively new building material.

It is scarcely necessary that we should trace the history of the use of terra-cotta in this country, which is full of strange vicissitudes. After being abundantly employed in the early years of the century, when it was manufactured by Messrs. Croggan, and subsequently by Messrs. Coade and Blanchard, to be sold as an artificial stone, it seems to have almost entirely succumbed to its victorious rival, Portland cement stucco, and to have fallen into disrepute. Under the judicious advice of Charles Barry, terra-cotta was largely used at Dulwich College, and its employment by Captain Fowke for the South Kensington Museum buildings, and by General Scott for the Royal Albert Hall, seems to have given a new impetus to the manufacture. In the earlier days of the use of terra-cotta, prior say to 1825, it appears to have been introduced mainly for ornamental purposes, for trusses, pateræ, and largely for the Royal Arms; an instance, however, of its employment on a far greater scale for the architectural features of a building, is furnished by its extensive application to the enrichment of St. Pancras Church, in the Euston-road, designed by the brothers Inwood, and completed in the year 1822. The colossal figures, or caryatides, at the east end of the building, were probably among the largest pieces of terra-cotta, till that time, attempted, and they appear to have been manufactured by Messrs. Rossi, who had works in the neighbourhood.

The colour of terra-cotta, which depends on the nature of the clay from which it is made, may vary from the richest and deepest red to a very pale buff. As the terra-cotta made by Coade was designed to take the place of stone, it was always buff or pale yellow in colour. In the more recent use of terra-cotta there appears to be a growing tendency to prefer the red to the lighter-coloured material, and architects are very particular in specifying a deep red tint, which it seems rather difficult for manufacturers to produce. There is no particular reason why red terra-cotta should not be made use of, and the only objection we can take to it is, that no red clay, or mixture of clays necessary to produce a red colour in the finished material, can be subjected to the same temperature in the kilns, or can be "burnt so hard" as the buff variety of terra-cotta; especially such as is made from fireclay. The red tint is of course due to the presence of the oxides of iron, and at extreme temperatures, or those which can be endured by fireclay with impunity, the red clays become twisted and discoloured, and even partially fused. Still in the last few years great improvements have been made in red terra-cotta, and many manufacturers are capable of giving us a safe and reliable ware free from the pale bricky tint which formerly was anything but desirable.

Reverting to the more particular subject we set out with, it should be noted that, in the Natural History Museum, Mr. Waterhouse has entirely mastered the nature of the material he had to deal with, and has boldly faced the necessity of employing blocks of a very small size. The attempt to make large blocks simulating stone was one of the rocks which at first seemed likely to be fatal to terra-cotta work; terra-cotta is a material which must be specially considered and treated, and the style of the building in which it is made use must even to some extent be modified to suit it. We do not mean to assert that it is a fair or a safe axiom to state that style must be subordinate to material; but in the case of such a material as terra-cotta there are many points which must be carefully weighed when the style of the building is under consideration.

Another important matter which Mr. Waterhouse has evidently taken into account is the great variation in colour of the different blocks. Some architects who have given terra-cotta a trial have insisted, and we think wrongly, upon a certain amount of uniformity in tint and have rejected all such pieces as were too dark or too light when compared with a given standard. This determination to keep the colour to one dead level compelled certain manufacturers to employ the hateful practice of washing over the terra-cotta with a thin coating of clay, which would give a uniform tint in the oven and thus produce the effect desired: an unhealthy bloom was thereby obtained, which, in the finished building, speedily wore off, leaving the work worse than it would have been had a little judicious selection of the variously colored blocks been possible in the first instance. It must be remembered that in terra-cotta made from a pure and unmixed fireclay, such as is that of Messrs. Gibbs and Canning, the darker the tint of the block the more thorough and perfect has been the firing and consequently the more durable and lasting will be the material; and that to discard blocks because they were too deep in colour would probably mean the rejection of some of the best of the work. It is by no means to the advantage of the manufacturer to send out an over-fired material, and we always look upon its presence as a good sign rather than otherwise. Now Mr. Waterhouse seems to have encouraged the production of this highly fired terra-cotta, and he appears almost to have emphasised, we know not whether intentionally or not, some of the constructive features by darker tinted blocks.

The New Museum is, moreover, the first building in the kingdom, we believe, in which terra-cotta has been the only material employed for the entire exterior surface, and to a great extent also for the interior lining of the walls. It has been usual on all previous occasions to make use of brickwork for the large plain surfaces, and to add the terra-cotta only as bands, panels, string-courses, &c. The Science Schools on the opposite side of the Exhibition-road, designed by General Scott, in which the whole of the uppermost story is of buff terra-cotta, unrelieved by brickwork, may, perhaps, have suggested this mode of treatment to Mr. Waterhouse. In order to obtain some contrast of colour, a number of bands and alternating blocks of a bluish grey colour has been introduced at various points with very excellent effect. We believe this grey colour is produced by an intimate mixture of the unbaked clay with cobalt or some blue mineral pigment which is then applied as a coating over the surface of the blocks. We cannot entirely approve of this plan of colouring the terra-cotta, though Mr. Waterhouse has doubtless satisfied himself that this decoration is perfectly safe and unchangeable. Fireclay has, we consider, the great merit of not requiring any admixture with other clays to yield a thoroughly sound and reliable terra-cotta. However good and safe the ware may be which is moulded from a compound of several clays, it is impossible to escape certain risks arising from defective incorporation of the various materials, and there is also a more or less constant tendency to differences in the shrinkage scale, and to other evils which may affect the durability of the work.

The architect of the Natural History Museum has not been able entirely to dispense with blocks of unusual size, and some of the animals and gargoyles are examples of the successful manufacture of relatively very large and difficult pieces of fireclay terra-cotta. An instance of the determination of Mr. Waterhouse to introduce terra-cotta wherever enriched work is needed, and an illustration of its employment where many who have treated of this subject would scarcely agree with him, is the introduction of the ornamental panels in this material into the Portland-stone gate-piers. It has been held by some as an article of faith that terra-cotta is a superior kind of brick, and should be used as such in a brick building. Here the architect has placed terra-cotta in panels sunk into the solid stone to receive it, and with an effect which we think, with all due deference to so high an authority, is scarcely satisfactory.

In the general details of the work, such as the mode of bonding the blocks in the different parts of the building, the colour of the mortar, the wide mortar joints with a V-shaped batter, the style of ornamentation and the choice of a suitable mode of enrichment, thoroughly adapted to the material, Mr. Waterhouse has proved how completely he has grasped the most fitting treatment for terra-cotta, and his new museum will, we are convinced, be long regarded as a triumph of successful terra-cotta architecture.

THE FATAL FALL OF HOUSES IN THE TOTTENHAM COURT ROAD.

THE result of the inquest upon the unfortunate men who were killed by the fall of houses in Tottenham Court-road ought to be a lesson to builders. It is, perhaps, superfluous to say that the verdict was the only one that could have been returned under the circumstances. Certain alterations had to be carried out to old and half ruinous buildings that required more than the usual amount of watchfulness and caution: substantial shoring was necessary during the process of under-pinning and raising the floors, instead of which we hear of the cutting away of chimney-jambs, and the lowering of the floors without due precautions. It is astonishing to believe that practical builders can have attempted to disturb the joists of a first floor without shoring up the front of a house resting upon a breastsummer, although the floor was independent of the breastsummer. In this case we have the front walls of two houses—we suppose at a rough calculation weighing over 50 tons—resting entirely on a brick pier between the two, about which no one seems to have taken the slightest trouble to ascertain its stability till it was found to have separated. The whole load was, as it appears, practically resting on a mass of brickwork about 18 in. by 14 in. without so much as a story-post. Mr. Spencer Chadwick, architect, who had examined the premises, gave it as his opinion that the cause of accident was the improper lowering of the floor which caused a displacement of brickwork, but the builder does not appear to have thought the pier which sustained the whole front of the houses worth considering though the front had slipped.

The accident should teach another and equally important lesson. It clearly shows us the inefficient working of the present Building Act, and the difficulties of carrying out its provisions with economy and despatch. A building may fall at any time and kill one or more people through blundering or neglect on the part of those who are engaged upon it, and in spite of the knowledge and protests of the district surveyor. In the present instance Mr. Wallen said he had "no knowledge of the risky work carried on until after the accident," and another witness deposed that the structural alterations did not appear upon the plans and specifications lodged with the surveyor. Here we have distinct evidence that there is absolutely nothing to prevent disaster, that work of a most hazardous kind may be undertaken quite unknown to the officials under the Act, and we know it to be a fact, also, that the power of the district surveyor is limited to merely appearing as a witness against the offending party, and that, under the present system of summonses, he has no power to stop buildings being carried out in violation of the Act or in a reckless manner.

We can see no possible means of remedying this defect in our metropolitan Act, except under a system of inspection by which the Board will be placed in possession of facts relating to dangerous structures and operations independently of the sources from which they now obtain their information, and we are glad to find the jury added a rider to their verdict regretting the inefficiency of the law in not giving power to district surveyors to stop buildings carried out in a reckless way, and recommending that serious cases under the Building Act should be tried by a Court composed of a magistrate assisted by a practical assessor. The jury also most properly observed that it was desirable that builders convicted of reckless conduct in dealing with building structures, should be liable to a heavy penalty. At present, notice of dangerous structures is given by parties interested in building, by builders, and others, and it is impossible that more than a small fraction of cases of this kind requiring attention can be brought to the district surveyor's notice. A building may be half pulled down, or something done to render the remaining portion positively dangerous to human life, and the surveyor may be in perfect ignorance of what has been or is about to be done. This condition of things should not be allowed; it should be in the power of the surveyor to not only prescribe the mode of shoring, but the procedure or operations; but to be able to do so, the building must be constantly under the eye of an inspector. Clauses 69 to 73 of the Dangerous Structures section appear, as it has been pointed out recently in our pages by Mr. Walker, quite inadequate to cope with the difficulty, or rather with the negligence and irresponsibility of builders and their foremen, and they give no power to the surveyor to act in cases of impending danger with promptness. The very definition of a dangerous structure should be laid down with some precision, and it ought to be clearly understand by builders and the public that a building is dangerous when it cannot meet any load or strain that it may become subject to in the course of alteration, building, or occupation. Thus an empty warehouse or a gallery may exhibit no signs of failure, and yet an ordinary warehouse load or a few people may bring it down *en masse*. In the case of party walls there is certainly need of constant supervision. We pass through very few old streets without seeing the houses in very dangerous conditions, owing to the withdrawal of timbers and the rough usage they are subjected to in the course of alterations of adjoining premises, and such causes of insecurity might be avoided by the system we have pointed out.

WORKHOUSE ACCOMMODATION IN ST. PANCRAS.

A VOLUMINOUS report has been issued, under the authority of the Vestry of St. Pancras, prepared by the clerk to the Vestry, Mr. Thos. Eccleston Gibb, having special reference to the necessity of increased workhouse accommodation, the proposal to rebuild the workhouse on the present site, and to erect a new town-hall in some central part of the parish. Mr. Gibb's report takes the form of a large pamphlet, in which he discusses the growth of pauperism, the effect of out-of-door relief, in-door accommodation, and the rebuilding of the workhouse. The key-note of the report is that the workhouse or indoor system, and not the system of out-door relief, is the most desirable; and the writer quotes Mr. Longley, Lord Lyttleton, and others to show the advantages of efficient workhouse accommodation. Pauperism has been admitted by Mr. Gladstone and other eminent exponents to be an undoubted evil, and the "deterrent principle" is recognised to be the one to be followed. The tables attached to the report show the growth of pauperism in St. Pancras for upwards of 20 years, and the cost of poor-law administration. During the past nine years out-door pauperism, it is said, has been "gradually and rapidly decreasing," while the number of indoor poor has been increasing, but less rapidly. The figures before us indicate these facts clearly, but we pass on to the part of the report dealing with the accommodation and the new workhouse. The advantages of the present site (about five acres), bounded by Oxford-row on the north, St. Pancras Gardens on the south, Cambridge-street and King's-road on the east and west, are pointed out, among them its healthiness and size, being surrounded by open roads and gardens. But these advantages are lost by the present arrangement of the buildings, which excludes the benefits that the site affords. The new workhouse, according to the plan in the appendix, proposes to retain the kitchen, dining-halls, and laundry blocks in the centre, and to erect several detached blocks on each side, the ends of which will overlook the gardens, with spaces between for a current of air to pass through. By this arrangement each block would receive sunlight on both sides. A chapel is shown in the centre and a large block in front. The total accommodation thus afforded is estimated at 2,500 inmates. Isolated casual wards are also shown. A statement is appended to this part of the report, showing that it would be easy to accommodate the above number of persons in industrial dwellings upon the site of St. Pancras workhouse. Discussing the proposal to erect a new town-hall, the report speaks of the necessity of a central building, in which all the public offices may be combined, including a police-court. Three sites are suggested: the corner of High-street and Crowndale-road, the corner of Camden-road and Kentish Town-roads, and the triangle at the junction of Monte Video-place and Kentish Town-road. Appended to the report plans of these three sites are given from the Ordnance Survey. We should think the first shown, that between High-street and Crowndale-road, the most eligible for the purpose. It is a rectangular site, has good approaches, and is within a short distance from the workhouse. The other suggested sites are triangular, and are farther northward. The Monte Video-place site is thought to be the most economical. The cost of the new building is estimated at about £30,000, and this sum, added to the cost of reconstructing the workhouse, is considered to not more than equal the cost of erecting a new workhouse on another site, and much less than the cost of erecting an additional workhouse. £100,000 borrowed for 50 years at 3¾ per cent., would involve an expenditure of less than a penny in the pound. We commend Mr. Gibb's able report to the attention of other vestries and guardians.

POTTERY AND PORCELAIN.[*]

MR. FREDERICK LITCHFIELD has produced a useful and readable guide to the hundreds of Englishmen who have begun to add bric-à-brac to their collections, or to furnish their houses after the fashionable manner. The author prefaces his work with some modest observations upon the demand for such a book, and, as he justly observes, the volumes hitherto published are "mostly departmental and expensive." There has been a want for a concise account of the distinguishing merits and qualities of pottery, giving a list of the marks employed by ceramic makers, and Mr. Litchfield's little book is well adapted to meet this requirement, besides giving references to larger works treating on different branches of the art. There can be little question that those who collect "old china" are not generally so conversant with the technical points as they might be; still less are their purchases or collections made from any principle of taste, or upon any well-founded knowledge of the potter's art. With many people, indeed, old china collecting is nothing but a mania, and it must be of special advantage to such persons that they should be guided in their choice, and not be subject to the deceptive arts and trickeries of dealers. Some very interesting chapters treating on the history of pottery introduce the subject to the reader. These include sketches of ancient pottery, the Mediæval and Renaissance periods, the modern period. A great deal of interesting matter is condensed into these chapters. Mr. Litchfield, for instance, tells us, upon indisputable authority, that there was no difficulty in producing a vitreous glaze upon ceramic productions at a very early period; that metallic oxides were patent to Eastern nations centuries before their introduction into Europe; and that the first attempt at decoration was to obtain a thin white coating or "slip," upon which the design was scratched through to the coarse ground. The specimens illustrated in this and other chapters will be of use to the collector. Speaking of the amphoræ of the Greeks, used for holding wine and grain, the author observes that the paste of the higher class was of three colours: brick-red, black, and the natural colour of the paste-buff; the black was laid on as a glaze. We find the author mentions Dr. Schliemann's discoveries in this part of the work, and Mr. C. Drury Fortnum and Dr. Birch are authorities frequently quoted. Mr. Litchfield agrees with Marryat that the revival of the manufacture of artistic pottery was imported from Spain and the Balearic Isles, notwithstanding Italian writers and Mr. Fortnum have shown that there were potteries at Pisa and other places in Italy. The Spanish claim is partly founded upon the fact that the Pisans besieged Majorca in 1115, and carried away some of the best specimens of Moorish art; the name of "Majolica" is certainly also suggestive. The conquest of Spain, and the expulsion of the Moors, no doubt introduced the manufacture of the highly-coloured and lustred earthenware known as Hispano-Moresque. The frontispiece to the book consists of an illustration of a fine two-handled vase in the South Kensington Museum (No. 8,968), made of this ware. The beautiful lustred effect was produced, according to Mr. Fortnum, by certain metallic salts reduced in the reverberatory furnace, leaving a thin film upon the surface. The author touches upon the manufactures at Granada, Malaga, and Valencia, which were the head-quarters of Spanish manufacture; and alludes to the invention of enamelled earthenware, by some supposed to be made at Pesaro, and to the celebrated Della Robbian ware, in which an opaque glaze or enamel was produced for the colours. Those who desire to study this kind of relief ware may find several specimens in the Museum at South Kensington, and one of the set of round plates (Nos. 7,632-7,643) exhibited there is engraved. It is painted in various shades of blue, with a white moulded border, and the figures represent the twelve months of the year. To the student of this period the author recommends MM. Delange and Borneau's illustrated work, "Fayence Italiennes de Moyen Age et de la Renaissance," in which twenty-three Italian factories are marked. Of Italian Renaissance ateliers, that of Gubbio is mentioned as most noted, the wares turned out by Gubbio, for whom Giorgio Andreoli worked, being remarkable for the brilliant colours and lustres. The signature of this artist was various; he used curious sketchy monograms. The work of Bernard Palissy is next described. He, of course, had a host of imitators, and the ware was made till the time of Henry IV. Henri Deux follows, and his ceramics are very rare. They are of a thin, delicate, incrusted stoneware, the ornament being engraved on a thin layer and filled in with colour. The celebrated Delft ware, which flourished in the 17th century, need hardly be mentioned. In Chapter III. we meet with some sensible remarks that we are tempted to quote, as they are well worth the attention of collectors; the author very truly observes the difference between ceramic art of the ancient and modern times, much of which is due to the commercial spirit, which is now made a test of everything artistic. The desire of making art manufacture remunerative is, of course, the motive of our principal manufacturers, and is the cause that art develops into manufacture. "When we look around," says our author, "even going no farther than the shop windows of one of our fashionable London streets, and notice in many instances the utter trash exhibited, compared with the fine old specimens we have in our mind's eye of early Sèvres, Dresden, or Oriental, how apt are we to exclaim that there is a dreadful falling-off in our latter-day ceramic art! But before passing a condemnatory verdict we must consider two things: first, to separate carefully *art* from *manufacture*, and though the bad copy offends the critical eye of the connoisseur, surely it is better that if the people must have ornament cheaply provided, they should have something to educate them towards the original rather than something utterly foreign in its nature; secondly, to recollect that 'the survival of the fittest' is an axiom in art as in political economy, and that the best is preserved to us from former ages; so posterity will judge of our nineteenth century art, not by its worst specimens, but by its best, even should some of these pass now with their merit unacknowledged." Further on Mr. Litchfield remarks, "One cannot help owning with some abatement of national pride that the excellence of our ceramics is due more to English energy and capital than to native artistic talent, a defect evident from the number of foreign artists employed in our principal potteries." It does not require much observation to assure us of this fact: why it should be so has been very ably pointed out by Mr. Gladstone in his well-known address at Chester, and which has been aptly introduced by the author, observations that may be read with profit by all interested in art-work of whatever kind. One fact of interest to note mentioned by the author is, that with few exceptions the decline and fall of factories has followed their rise and progress in a short time, showing that the limited production has not been able to support the heavy expenses incurred in the manufacture of ceramics. Of those which have survived we have: Dresden, founded in 1709; Sèvres, 1745; Worcester, 1751; and Berlin, 1751. Speaking of the Royal Saxony factory, its chief fault is said to be an ultra-Conservatism in its management and a rigid adherence to old models and designs. The Meissen factory is distinguished for spirited modelling and delicate colouring, which English and French manufacturers admit by copying its models. The canary yellow, the dark blue, and a recently introduced green are prevalent ground colours, but the landscape subjects might give place to designs of more suitable and original character. The Sèvres factory depends more upon its past reputation, and the author says, though the forms and ground colours are good, the delicacy of the old *pâte tendre* is wanting, and the painting shows a falling off since Madame Pompadour's time.

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[*] Pottery and Porcelain: a Guide to Collectors. By Frederick Litchfield. London: Bickers and Son, Leicester-square.

But we pass on to notice the principal value of Mr. Litchfield's book, namely, the account of ceramic factories with their distinguishing marks. These are arranged alphabetically, and will be found useful to collectors and students who are in quest of information as to dates and characteristics. As specimens, we quote a few of the notices. "Amstel.—This manufactory, the first porcelain establishment in Holland, was founded in 1764 by Count von Grönsfeld, with the assistance of some runaway workmen from Saxony. . . . Its characteristics are: hard paste, a fine white body, and the decoration generally in landscapes and country scenes, or single figures of Dutch peasants (specimens in Museum of Practical Geology, Jermyn-street). The marks are the cypher A for Amstel, the word in full or with some abbreviation, and the letters M.O.L., which stand for Manufacteur oude Loosdrecht; the earliest marks being the cross-swords, possibly in imitation of Dresden, and a W. for Weesp (near Amsterdam)." The several marks and monograms are appended in each case, so that the purchaser can examine for himself as to the authenticity of his specimens. Of Chelsea an interesting notice appears. One author, Mr. Jewitt, attributes the commencement of the Chelsea works to John Dwight, who, in 1684 had been granted a patent for his manufactory at Fulham. Under the reign of Queen Anne the factory does not appear to have flourished, but with the accession of the House of Hanover it received an impetus by the employment of foreign artists. The sign generally adopted was the anchor in red or gold, and on some pieces a small embossed medallion, with the anchor in relief. The Derby porcelain, which was manufactured from 1756 to 1785, is a fine white and soft paste, decorated with landscapes and flower-pieces, well painted. In the tea and coffee services a beautiful transparent full blue border, relieved by gilding, is common; the cups were often fluted. The marks or devices are various and quaint, including crowns and ribbons, single or in combination, cross-swords, &c. The new company's London warehouse is at 27, Ely-place, Holborn, Mr. Edward Phillips being managing director. The Dresden porcelain is fully described. The early specimens are now very rare. They were of a dark red colour; later on a fine white earth was brought into requisition. Böttcher was the first director. In 1731 Kändler, an artist of repute, introduced wreaths, bouquets of flowers, vases, and animals. Gilded borders and medallions were also used in the decoration. The specimens produced about 1778, known as the King's period, are of the highest quality. The Marcolini period also, which succeeded, was rich in decoration, a deep *gros bleu* being used as a ground, with groups of mythological figures and landscapes. The present manufacture follow the old models. The writer says, "at the present time no porcelain commands a higher price than old Dresden, at the recent sale of the Dickens' collection as much as £380 being given, by Mr. E. Joseph, for a small group of some four figures." The specimens at the South Kensington Museum are interesting as the best productions of the Meissen factory. The commonest marks are the cross swords. We have not much information regarding Japan, which is rather an omission; the marks, like those of China, are very numerous. Chaffers, in his work on marks, gives some 30 or 40 illustrations; some beautiful specimens are engraved from Messrs. Henry Doulton's Lambeth Pottery, a brief description of which is given. The Doulton ware is the revival of the old Grès de Flandres, and its decoration, with which our readers are familiar, need not be described here. It is scarcely necessary to add that Messrs. Doulton have largely developed the artistic qualities of their highly-appreciated manufacture. Minton china is also fully described, and several pages are devoted to the history and marks of Sèvres, from the first Republican Epoch, 1792, to the second Imperial Epoch, 1872. A table of marks and monograms of the painters and decorators are appended, from 1753 to 1800, and will be found interesting. Wedgwood and Worcester are, of course, among the list of noted factories to be found in the catalogue before us, and several interesting facts are recorded. Chapter VI. contains some useful hints and cautions to collectors. The author advises the student to spend a quiet morning or two in the ceramic department of the Museum of Practical Geology in Jermyn-street, which comprises representative specimens of each period and a very good illustration of the English school. The raw material and its various mixtures are also to be studied here. Would-be collectors should also visit Christie's rooms in King-street and watch a sale, so as to note the prices; much practical information may be picked up in this way. The author says, "To buy successfully in an æsthetic, as in a commercial sense also, a specimen should be examined as to its quality of paste, brilliancy of colour, special characteristics as a specimen of its factory, decoration, the drawing of the figure, if a subject, the natural effect of flowers or fruit, or the distance and softness of a landscape, &c." Imitations and restorations are, of course, a great source of difficulty to the buyer. Palissy and Henry II. are numerous as imitations, and it is necessary to be able to detect the difference between the delicate soft paste of old Sèvres and modern paste; but we leave Mr. Litchfield's book to the reader, believing he will find in it a useful guide to the discriminative purchase of old china.

L'EMULATION.[*]

About twelve months since we briefly announced the appearance of a monthly publication, started under the title "L'Emulation," and issued by the Central Society of Architecture in Belgium. The year's volume, now before us, is a large folio, comprising about 55 photo-lithographic plates of illustrations, printed in dark brown ink. Many of the designs are executed, and the collection promises to represent the existing state of the architecture of Belgium. The plates are of a workable size, and not too large for practical purposes; but the scales that have been converted into feet and inches are unreadable, and it would have been better to have given under each, the fraction of an inch that represents an English foot than the method adopted in most cases. We cannot speak in very flattering terms of the designs. The elevations, we find, are all shaded, the advantage of which is open to doubt; it would have been better, we think, if the shading had been less heavy, so that the detail might have been made clearer. The sections and details furnished enhance the usefulness of the work; but a greater value would have been bestowed if more plans had been given, the few that are furnished being too small. Glancing over the designs, we find a double-page elevation of the Belgian compartment in the Universal Exhibition of Paris, 1878, the design of Em. Janlet, which may be taken as representative of Belgian taste. We cannot find much fault with the general masses; the archway is bold, and some of the features good—as, for instance, the open gallery—but the details are jumbled, and there is a decided want of rhythm or gradation in the fancy-cut gables and corner cupola. There is a senselessness also in the scrolls which adorn the dormers and doorways, in spite of good work in other parts. Seven large plates illustrate this design. The design for a monumental stone bridge, by M. Jean Baes, contributed to the Academy of Belgium, is clever; there is a landing-stage and stair approaches to the bridge level; the smaller piers have small pavilions or niches over them, and the semicircular flights of steps to the embankments are useful and suggestive. The design has merit, though of an ideal order. M. Henri Vandeveld's design, distinguished as the first prize, has three arches, the centre one being largest, and a side footway with steps at the end is made to form a communication between the lower levels of the embankments, while the carriage-way is covered by a lofty flat roof, supported on open colonnades of the Ionic order. Circular towers, with archway at one end and a lofty square one at the other, terminate the composition, which is marked by some originality and boldness. The Commercial House in De Brouckere Square, Brussels, by E. Janlet, has some merit in the plan of staircases and the recessed story at the top is a good feature, but we do not admire the order of pilasters above the arched shop openings. The details are effectively drawn. Certainly the most interesting illustration is the plan and section of the Prison at Tournai, by F. Derre. The general plan is on the radiating principle, three blocks of cells with central corridors leading from an octagon centre, which is devoted to the governor and administration. Special points to be noticed in this design are the semicircular spaces for recreation, divided by radiating walls at the ends of each block, and the rooms disposed round the centre chapel on the first and second floors. We cannot admire the triangular lodge on plate 23, nor the arched gateway plate 25. Some rather florid work is to be found in the details of the gallery to the Town Hall, Brussels; the capitals are rather lumpy. The plans for a guardian school, showing three prize designs published by the Central Society, are ingenious; but the elevation of the 1st prize design is spoilt by the unmeaning scrolls and terminals of the gables, and the pigeon-house excrescences on the roof. Perhaps the most sensible treatment is that of No. 3. We have no space to further criticise. Plates 40-43 represent a church, in what we may term Modern Fantastic Romanesque; the details of porch (46), the tracery in plates 47 and 49, and the turrets, are examples to be avoided. The house-fronts in plate 51 are clumsy adaptations, the balcony and cut stone cornices heavy and unrefined. We might take parts from some of the designs, but of the bulk of the collection we can only say that it well represents the uncertain vigorousness of a style which borrows without much assimilation the features and details of both Gothic and Renaissance. If rivalry is to bring about a more satisfactory style, the work we have noticed may help if it only remains true to its title.

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[*] L'Emulation. London: J. Davis, Old Kent-road.

THE SEWERAGE WORKS FOR THE CROYDON RURAL SANITARY AUTHORITY.[*]

THE sewerage works at the present time under course of construction for the Croydon Rural Sanitary Authority involve the construction of over 36 miles of brick, brick and concrete, and pipe sewers; the erection of a pumping station, with the necessary machinery for pumping the low-level sewage, and for the subsequent treatment of the sludge; the preparation of an intermittent filtration area for the purification of the sewage; the construction of an iron bridge over the river Wandle; the boring of an artesian well, and the erection of two detatched cottages; in connection with the sewerage and disposal of the sewage of the parishes of Beddington, Merton, Merton Rush, Mitcham, and Morden, and the hamlet of Wallington, Surrey, containing a rapidly increasing population, estimated at the present time at about 17,000. The system adopted throughout for the drainage of these districts is the water-carriage system, with which all engineers are familiar. The rainfall is not admitted into the new sewers, but is conveyed directly to the natural watercourses, by the sewers existing previous to the construction of the new system, which are in every case retained for this purpose. Nearly the whole of the sewage will flow directly on to the filtration area by gravitation alone, a portion only of the districts of Merton and Morden, containing, at the present time, about 300 houses, requiring the services of a low-level outfall, from whence the sewage is subsequently pumped at the sewage works from a depth of 20ft. into the gravitation outfall. The sewers are of four types. No. 1 is the stoneware, salt-glazed, socket drain pipe, as manufactured by Doulton and Co., and which requires no further description. The mode of jointing these sewers is as follows:—Tarred gasket is first forced into the joint, which has the effect of preserving the concentricity of the pipes, and the prevention of the entry of any sand into the sewers; the annular space is then filled with neat Portland cement; and a fillet of the same worked around the outside. Care is taken that no cement shall form a projection on the inside of the sewer, each joint being carefully cleaned as the work proceeds. In very wet ground the water in the trench is pumped down from a sumph in advance of the sewer, until the cement joints are made, when a layer of puddled clay is placed around the newly-made joint, which serves the double purpose of keeping the cement in place until set, and of stopping any possible leak that may occur through the accidental fracture of a joint on the subsequent refilling of the trench. The pipes previous to being laid in the trenches are fitted together on the surface in convenient lengths, so that the invert may be perfectly true, and the space between the socket and spigot such that a sufficient quantity of cement may be admitted all round to ensure a watertight joint. All pipes having more than a slight deviation from the true circular are rejected, it being impossible to meet the above requirements with ill-shaped pipes. The pipes are each tested by being struck by a small hammer, by means of which the presence of a flaw is readily detected. No. 2 is a combination of stoneware pipes, embedded in Portland cement concrete. This method of construction is adopted for sewers up to 18in. in diameter, when laid in deep cuttings in treacherous ground. No. 3 section of sewer is the type which has been adopted for the main gravitation outfall. This sewer is constructed of an inner ring of brickwork, surrounded by a Portland cement collar joint 1in. in thickness, the whole embedded in Portland cement concrete. The collar joint has been introduced for the purpose of keeping the sewer watertight, and has been found most efficient. The method of constructing these sewers is as follows: 6in. of concrete having been placed on the bottom of the trench, a semicircular mould, like an inverted centre, is placed thereon; the concrete is then well worked in up to the springing, and the moulds are not removed until the concrete is thoroughly set; on the removal of the moulds the collar joint and brickwork is proceeded with, and the remainder of the concrete in due course. No 4 section of sewer has been adopted for the tank sewer, for the reception of the low-level sewage during the time the pumping engines are at rest. It is constructed of two rings of brickwork with cement collar-joint as before described between the inner and outer ring. The importance of constructing the whole of the sewers as nearly as possible watertight, apart from sanitary reasons, will be apparent when the capacity of the main outfall is considered, the theoretical maximum discharge from this sewer, when not working underpressure, being 501 cubic feet per minute, and no less than 33 miles of the new system of sewers contribute to the same. The total number of joints in this length of sewer will be about 90,000, and the effect of the leakage of one drop of water per second at each joint would be to bring a volume of water on to the filtration area equal to an annual rainfall of 62in. Manholes, circular in form, 5ft. internal diameter at the bottom, and 2ft. at the top, are constructed at all intersections of streets, and at each junction of a branch with a main sewer; also a manhole or combined ventilator and lamphole is placed at each change of direction or gradient of the sewers, the straight line principle being adhered to with few exceptions throughout. Any part of the system may be thus readily examined, and the locality of any defect or obstruction be at once detected. The outlet from each manhole is provided with a stoneware flushing block, having a ground face, and two projecting iron clips for the reception of a wooden stop-board as an arrangement for flushing. The inlets are each provided with a stoneware balance valve having an iron flap hung at the top, and in the centre of the flap a screwed spindle with ball at end, by means of which the amount of opening at the bottom can be easily arranged. The object to be obtained by the use of these valves is to prevent the passage of currents of air through the sewers, and to localise and expel the gases generated in each division. These manholes and ventilators are finished at top with a Latham's patent spiral charcoal ventilator. The minimum fall for the various sizes of sewers is as follows:—

27in.	1 in 1,200
24 ,,	1 ,, 900
18 ,,	1 ,, 900
15 ,,	1 ,, 700
12 ,,	1 ,, 500
9 ,,	1 ,, 300

and the whole of the sewers will be self-cleansing, as the minimum velocity of any sewer when running half full will be 118ft. per minute. Flushing wells are constructed at various points on the system, the points selected being such that a sufficient supply of subsoil water may be obtained for flushing purposes, and as large a district as possible be under the influence of the well. These flushing wells are constructed in a similar manner to the manholes, with the exception of the bottom work being laid dry to allow of the accumulation of the subsoil water in the well. They are connected to a manhole on the sewers by a line of pipes provided with a sluice-valve, on opening which the flushing of the sewers is easily and readily effected. The pipe sewers at all crossings under railways or rivers are constructed of cast iron, and the brick and concrete sewers are strengthened by an additional ring of brickwork. The cement used on the works is the best Portland. No cement is used that is incapable of bearing a tensile strain of 350lb. to the square inch, when tested on a section having an area of 2¼ square inches, after seven days immersion in water. An Adie's cement-testing machine is used for testing the briquettes. The proportions for the concrete are six measures of clean gravel and sand to one measure of Portland cement; and the cement mortar, two of clean sand to one of Portland cement. The pumping machinery, manufactured by Hathorn, Davey, and Co., of Leeds, comprises a pair of horizontal, rotative, condensing pumping-engines. Each engine and pump is capable of lifting 7,500 cubic feet of sewage 20ft. high per hour, when working at not more than thirty revolutions per minute, in addition to driving the gearing for one chemical mixer and one pump for the filter presses, the use of which will be described hereafter. The steam cylinders are 12in. in diameter, stroke 20in., fitted with slide and expansion valves. An air-pump and a condenser, self-contained in one casting, are provided for each engine, worked from the end of the engine piston-rod. The boilers are of the Cornish type, diameter 5ft. 3in., length, 14ft.; single flues 2ft. 9in. diameter. The fly-wheels each weigh 1 ton. The main pumps are similar to those designed by Mr. Baldwin Latham for the Dantzic Sewerage Works; each pump having a piston and plunger 22½in. and 16in. in diameter, with a stroke of 20in., the pumps being worked directly from a disc on the end of the crankshaft. There are two filter presses for the treatment of the sludge, one of Needham and Kite's, and one of Johnson's. The sewage from the high and low level sewers will be received into the tanks within the pumping station, and after being filtered through coke, will be conveyed, by means of properly-constructed main and subsidiary carriers, onto the filtration area; the deposited sludge being subsequently treated by chemicals, and consolidated by the filter presses. The intermittent filtration area for the final reception and purification of the sewage, consists of an area of land 28 acres in extent, and 8 acres in addition are reserved for the present. The character of this land varies considerably, being composed of alluvial deposit overlaying the London clay, the constituents of the deposit being beds of gravel and sand, marsh, clay, and peat. The depth from the surface of the ground to the London clay varies from 3 to 17ft. Subsoil drains for the reception of the purified effluent will be laid at the requisite levels. The impervious beds, where necessary, will be burnt into ballast or removed, and suitable porous material substituted down to the level of the subsoil drains. The purified effluent will eventually flow into the river Wandle. The whole filtration area is enclosed by a clay puddle wall 2ft. in thickness, the excavation for which has been taken down 1ft. into the London clay. It has the effect of effectually preventing the passage of any water either from the river Wandle or the surrounding waterlogged strata into the filtration area. An artesian well has been sunk at the pumping station for supplying the water required for the condensers and for other purposes. This well is 6in. in diameter, lined with cast-iron pipes fitted with wrought-iron flush collars, the bottom pipe being provided with a steel shoe. The well is bored to a total depth of 230ft. through the following strata :—Alluvium, 12ft. ; London clay, 80ft. ; Woolwich and Reading beds, 40ft. ; Thanet sand, 47ft., and into the chalk, 51ft. Depth to chalk, 179ft. The bottom 30ft. of well is not lined. The volume of water flowing from the well, and which is derived from the chalk, has remained constant since the completion of the boring. The yield is at the rate of 5·79 cubic feet per minute, or 52,100 gallons per 24 hours, and the temperature of the water 54°. These works were designed and are being carried out by Mr. Baldwin Latham, M.I.C.E., as engineer-in-chief, the author acting as resident engineer. The total amount of the contract for the whole of the specified works is £74,708, the contractors being Messrs. B. Cooke and Co., of Phœnix Wharf, Battersea, their representative being Mr. T. W. Wilkinson.

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[*] A paper read by W. Santo Crimp, A.I.C.E., F.G.S., at the Merton meeting of the Association of Municipal and Sanitary Engineers and Surveyors, Dec. 5th, 1879. [See p. 701, ante.]

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE second ordinary meeting of the session was held on Monday evening; Professor T. Hayter Lewis, V.P., occupied the chair, in the absence, through illness caused by the inclement weather, of the president and hon. secretary. The Secretary (Mr. White) announced several donations to the library, including the *Transactions* of several societies, a continuation of Mr. J. H. Parker's "Archæology of Rome," and a continuation of Messrs. Audley's "Architectural Dictionary." At a later period of the evening Professor Kerr called attention to the latter book as a labour of love, which had been carried to the completion of the first volume by two brothers practising as architects at Liverpool; it was a work at once comprehensive and serviceable, and differed from the dictionary in course of issue by the Architectural Publication Society in that it would deal only with the art side of architecture. The first volume was confined to A, but had already reached a second edition. Mr. W. G. Audsley having stated, in answer to a question, that the work would be completed in ten volumes, a special vote of thanks was passed to him, Mr. Barry expressing the hope that Mr. Audsley would thoroughly succeed in the ambitious project he had proposed to himself. The Secretary also announced additional donations to the Improvement Fund of ten guineas from Mr. Street, ten guineas from Mr. Hadfield, of Sheffield, and four guineas from Mr. Martineau, and, in proposing a vote of thanks to the donors, the Chairman said that the general opinion was that the alteration had been eminently successful. Amongst the new members admitted was Mr. Leonard, chief engineer of the Presidency of Bengal, an hon. associate.

The Chairman said it was proposed to dispense with the ballot in the case of the three royal princes who wished to be admitted as hon. fellows, who would be proposed and seconded in the usual way, and there could be no question that these noble princes would be welcomed with acclamation. Mr. Barry then proposed and Mr. Penrose seconded a formal motion for dispensing with the ballot, which was agreed to, and Mr. Barry then proposed *seriatim* the election of their Royal Highnesses the Duke of Edinburgh, the Duke of Connaught, and Prince Leopold, expressing his belief that the Institute would receive an accession of strength in the adhesion of "the rest of the Royal Family." The Chairman again expressed his gratification at the addition to the Institute's membership, and put the motion, which was carried by acclamation. Don Rafael Contreras, of Granada, Spain, was also elected without the ballot as an hon. and corresponding member.

THE LATE FREDERICK PEPYS COCKERELL.

The Secretary read a memorial sketch of the late honorary secretary to the Institute, written, it was explained, by a very near friend, who did not wish his name to be mentioned. On Nov. 8, 1878, the issue following Mr. Cockerell's sudden death, we published an obituary notice, and amongst his works illustrated in our pages may be mentioned : House at Lythe Hill, Haslemere, in the Building News of Sept. 15 and Oct. 13, 1871 ; Down Hall, Harlow, July 4, 1873 ; and a house in concrete and brick at Datchet, Oct. 26 and Nov. 2, 1877. As an artist and as a man in and of society, rather than as an architect, the writer of the memoir treated of his friend, the chief portion of the sketch being devoted to incidents in his youth and early manhood. Indeed, the author at the commencement admitted that no succession of great public works executed by Cockerell arrested attention ; but this notwithstanding, who was there, it was asked, among the most distinguished in architecture, who did not feel the loss sustained in his death? As an artist he would be remembered—as a man of delicate taste and fine perception, of generous impulse and catholic liberality, which, harmonising the intellectual with high moral qualities, formed a character of rare attractiveness not easily conveyed to strangers to its refining influence. Frederick Pepys Cockerell, born in 1833, was the second surviving son of Charles Robert Cockerell, R.A., and Anna Maria his wife, daughter of the engineer John Rennie. At that time no name was more illustrious than his father's in the society which awards honour to artistic genius. Shortly after he was appointed to the Professorship of Architecture in the Royal Academy, his interest in the reputed works of William of Wykeham led the elder Cockerell frequently to visit Winchester College, and there he placed his son Frederick, as a commoner, in the year 1845, and the bright-faced, curly-headed boy won his way rapidly to popularity and the full enjoyment of school life. Already, in so early boyhood, his father seemed to have discerned and appreciated in him some germs of an æsthetic tendency. A little entry in Mr. Cockerell's diary during his son's first holidays was touching when read in the light of after events: "June 28, 1845. With my boys to the Academy Exhibition; judgment and taste in Fred ; more combativeness in Robert." The one was to be their artist friend; the other, who set his heart upon a soldier's career, fell gallantly in his twentieth year, as a lieutenant in the Royal Artillery, at the memorable battle of the Alma. At the close of 1848 Fred matriculated at King's College, London, and the reason for this so early change in his course of studies may probably be found in the name of the department to which he was attached, viz., "Applied Science," with all the branches of which his father, clearly destining him to the profession of architecture, desired that he should now begin to be conversant. For about five or six terms he constantly attended the lectures, during which time his fellow-students were more impressed by his presence, vivacity, and cleverness of conversation, than by any apparent devotion to severe study. At Professor O'Brien's lectures on natural philosophy his note-book was fuller of deftly-traced towers, pinnacles, and spires, than of the teaching which its pages were intended to record. Familiar with a favourite theory of Professor Cockerell that the human frame is the basis of all idea of beauty, he set himself with interest to a study which must always be the foundation of correctness in figure-drawing. It bore fruit in the facility which he afterwards enjoyed of thorough truthfulness in the expression of an instinctively delicate sense of form. In designing decorations, he would outline a figure 2ft. high, from head to foot and up the other side, without taking his pencil from the paper. This dexterity was no less edifying to those who witnessed his office-work than amusing in general society. It happened one day in 1851 that a student at the old School of Design in Somerset House, now a successful painter, observed a youth whose appearance struck him, but whose name he did not know, to be diligently working at the remains of an antique statue—the legs of a Faun. Hearing that he was an architectural student, the young painter commenced an acquaintance with him by expressing surprise at the then unusual devotion of time to this line of study by one whose professional intention was thus fixed. He remarked that Professor Cockerell was the only English architect he knew, of real power in designing the human figure. "He is my father," replied the young man, with animation and delight, "and I am trying to follow him." His pride and trust in the guidance of his father were unbounded, and it was impossible, in reviewing his own life, not to recognise the influence which the teaching, example, and constant companionship of the Professor exercised in determining the form which the son's artistic temper finally received. One idea of Professor Cockerell's, which often formed the subject of conversation, was that, for any approach to perfection, a modern building demanded the co-operation of two architects, the one to devote himself to utilitarian arrangement, the other to artistic embellishment. These suggestions perhaps increased the apparent indisposition of a boy to devote to the drier details of the prescribed instruction the same application as accompanied the exercise of his pencil. Withdrawn, however, in his seventeenth year, from the generalities of class-rooms to more intimate practical training, he must soon have been disabused of any uncertainty as to the requirements of actual practice. Mr. Goodchild, for many years the valued chief clerk, and through life the faithful friend of Professor Cockerell, who as architect to the Bank of England had offices there, gave him the first lessons in perspective drawing: and new offices at the Bank were then in course of construction, while designs had to be furnished for branches in provincial towns. During the summer of 1850, with an independence then not often confided to boyhood, but forming part of the Professor's educational design, he made a sketching tour in northern France, and returned to distribute his autumn between the School of Design and some subordinate occupation in connection with the Exhibition Building, in Hyde Park. To some months of study at Paris, in the spring of 1853, and to the admiration he there conceived as much for the system as for the results of the training in the Parisian school, must be referred a perhaps somewhat exaggerated estimate formed by Frederick Cockerell of the lofty aims and ambition of perfection which he deemed specially characteristic of French architects ; and in his own earlier designs the French idea was profusely blended with the classical. Caristie, who so far back as 1815 had been a friend and companion of Charles Robert Cockerell, at Rome, now readily undertook the direction of the son's studies, lending him drawings, advising him in his copies, and introducing him to men of the highest eminence in his art; to Viollet-le-Duc among others, and to Visconti, then fully engaged on the transformation of the old Place du Carrousel and substitution of the splendours of the new Louvre. The seed fell on no thankless soil ; young Cockerill's diligence was unstinted. Later in that year he made a perspective drawing of St. Paul's Cathedral, which, with some alterations and introduction of figures suggested by the late Clarkson Stanfield, R.A., was exhibited at the Academy in 1854. Cockerell was early in that year a pupil in the office of Mr. Hardwick, R.A., where there was a great deal of business; and, under the immediate guidance of Mr. P. C. Hardwick, who found him, "from his thorough knowledge of his own favourite style of art in many cases of much use," he, for the first time, assisted in the planning and laying out the site for country houses. In the early days of 1855 he visited Rome in company with a fellow pupil at Hardwick's, now an architect of distinction, and while there he passed through a phase of life quite painful while it lasted, of longing to become a painter instead of an architect. However, a letter of appeal to his father brought a reply unfavourable to his views, but containing advice so sound and arguments so convincing that he never afterwards suffered his feelings to interfere with architectural studies and training. During the winter of 1855-56, he was one of a colony of nine young Englishmen who were living in the Via Felice, at Rome, and returned to London to assist his father, who was now gradually retiring from active professional life, to direct the progress of work at country seats and to take part in the competition for the Government Offices. Cockerell's first independent professional work was done in 1858-59, consisting of a cemetery chapel and other buildings at the picturesque little town of Ledbury, which led to his building one or two more small houses in the neighbourhood. His specialty came to be the design of country houses and the alteration and improvement of existing ones; and one of his earliest successes was achieved in raising the elevation and making additions to Coleorton Hall, the seat of his cousin, Sir George Beaumont, which materially improved the proportion and dignity of that somewhat bizarre work of Dance. Among the more important of his houses were Down Hall, Essex, in the Italian style, where an excellent effect was produced by the use of concrete with decorative panels in sgraffito; Lythe Hill, Haslemere; and one of the most recent, Crawley Court, near Winchester. This was a large and imposing work, its idea a modified Elizabethan, its material brick and the grey flint of the country, with terra-cotta introduced into the window mullions, the whole effect being very light and soft. There were difficulties connected with the site: some exceptionally fine tall trees stood in close proximity, and it was feared that any building short of being colossal would be dwarfed by them; but Cockerell managed his elevation with such judgment that the house, without being immoderately large, seemed to reign duly supreme and asserted itself a successful rival to its lofty surroundings. One undeniable merit attached to his residential buildings, the more remarkable as it indicated a feeling apart from his delight in the beauties of proportion and decorative work; he was always especially studious of the *genius loci* where he was called upon to build. His only work of importance in London was Freemasons' Hall, for which his designs were selected in competition (1864). The highest recognition of the success within the power of the craft to bestow was shown by their architect's immediate appointment to the high office of Grand Superintendent of Works, which, although one subject to annual change, he continued to hold to his death. A reflection would occur to all who criticised in his company or conversed with him upon the works of bygone days or of those of contemporary architects: he was unusually liberal of appreciation in art. It was impossible for anyone to be more free from bigotry in favour of the classical or the mediæval school, or any special development of either. With the former naturally enough his name was in early days hereditarily linked, but his sense of the beauties of the latter, in their proper association, was manifest in the reverent care with which he always approached the restoration or enlargement of old buildings. But he regarded style as altogether second in importance to the great principles which underlie beauty, and which his power of analysis enabled him to distinguish and to prize. Eminently catholic in æsthetics, from a naturally acute perception of beautiful things and the effect of early education, his sweetness of disposition and utter freedom from any spirit of captious detraction robbed even the most condign disapproval of offence, so that those of his younger associates who sought his judgment found in the critic the friendly teacher too.

Mr. C. Barry proposed a vote of thanks to the author of the paper, and said there was a certain propriety in his name remaining unknown because he had expressed the general sentiments as to their late friend, in whose bright ideas there was great promise of success, which had he been spared to a green old age would, he believed, have been entirely realised. To a certain extent, however, he was to be congratulated, if such an expression might be used, for leaving behind such a name among his confrères, unmixed with envy, not sufficiently known to excite criticism, but rich with pleasant memories of social intercourse and friendship. Many present, especially in their younger days, could have sympathised in Cockerell's desire to become a painter rather than an architect, and perhaps occasional indulgence in these visions of a wide field of imagination was just the recompense architects had for the dull routine of professional life.

Mr. C. L. Eastlake, in seconding the motion, bore testimony to the faithfulness of the memoir, His friendship with the subject dated back many years, to the time when for a short time they were associated in the office of the elder Hardwick. In the youthful coterie to which they then belonged, Cockerill's social qualities, his genial manners, and his artistic tastes, made him a general favourite, while he was neither vain nor indolent. For the post of hon. secretary to the Institute he was admirably fitted: of his professional works he (Mr. Eastlake), who was now outside the profession, would leave other members to speak.

Mr. G. Aitchison expressed his keen regret that their friend had been cut off so early, and dilated on his social qualities, remarking that he was the greatest "swell" amongst them all, and that no one could have been in his presence without feeling that he was in the best of society. He was, besides being an artist, a critic of books, painting and sculpture, one of the great architects of the Renaissance—in fact he was like a cut crystal, no side of which was not fully polished, or from which light was not sent forth.

Mr. Horace Jones, as the oldest of the small coterie of architects to which Cockerell belonged, added a warm testimony of appreciation of his cheery, honest, English character, and the Chairman put the vote of thanks to the anonymous author of the paper, which was carried unanimously.

The meeting was then resolved into a special general meeting of Fellows only to consider the revision of by-law 34, as well as the form of nomination (No. II.) referring to candidates for membership resident abroad, and the form of nomination (No. III.) referring to home and corresponding members.

THE LAW OF FIXTURES.*

(*Continued from p.* 674.)

3. We will lastly consider the right to remove fixtures as between landlord and tenant. The right of severance and removal of annexations to the soil by the tenant of a particular estate has in modern law developed into a right of considerable value and importance. It must be remembered that the situation of a tenant, and the nature and extent of his rights relating to fixtures, may be varied by private contract, and the construction which has been placed by the Courts upon covenants of this kind will receive separate attention; but, for the present, it must be presumed that there is no such private contract affecting his rights as to fixtures, and that the demise contains no covenants that relate thereto. The position of the tenant will now be considered apart from any such incidents, and with regard only to his rights as sanctioned and established by the general rule of law; and where it has been determined that a right of severance exists under the circumstances already discussed *à fortiori*, it may be taken to exist when the relative position of the parties is that of landlord and tenant, and the cases already cited will be applicable, so far as they allow of the existence of a right of severance and removal, to the state of facts now under consideration.

The presumption of law which arises from "the position of the parties," when they stand to each other in the relation of landlord and tenant, is one in the least degree favourable to an *intention to permanently benefit the freehold*; in fact, an *intention to permanently benefit the freehold*, on the part of a tenant annexing articles to the soil, can never be presumed solely from the relation of the parties as landlord and tenant.

It will depend in a great degree upon a consideration of "the mode and degree of annexation," "the nature and character of the fixture, and the use for which it is intended," to determine whether a fixture is "movable" or "irremovable"; in other words, these two latter incidents now become the most important *indicia* of the intention. If the article is so firmly annexed to the freehold or incorporated therewith that it cannot be removed without *permanent injury to the freehold*, the tenant will not be allowed to remove it. It is a proper question for a jury to determine whether the removal of a fixture would cause substantial injury to the freehold, and such a direction on the part of the judge is a good test of the mode and extent of annexation (a^2). A windmill, built of wood and resting on a brick foundation by its own weight alone, was held to be a chattel and a "movable fixture between heir and executor (a^3). A barn constructed of wood resting on staddels of stone, built into a brick foundation, may be removed by a tenant, but the foundation must remain. This case was decided on the ground that the barn was not fixed, and that a wooden barn so constructed was *not annexed* to the soil. In "Buckland v. Butterfield," a conservatory which had been purchased by a tenant for years and brought from a distance was by him erected on a brick foundation, 15in. deep, upon that was bedded a sill, over which was a framework covered with slate; the framework was 8 or 9 feet high at the end, and about 2 feet in front. This conservatory was attached to the dwelling-house by eight cantilevers, let 9 inches into the wall, which cantilevers supported the rafters of the conservatory: resting on the cantilevers was a balcony with iron rails. The conservatory was constructed with sliding glasses, paved with Portland stone, and connected with the parlour chimney by a flue; two windows were opened from the dwelling-house into the conservatory, one out of the dining-room, another out of the library. The Court held that the conservatory *had become part of the freehold*, and could not be removed by the tenant or his assignees. Chief Justice Dallas appears to have decided this case on the ground that there may be a "sort of fixing or annexation which, though the building or thing annexed may have been merely for ornament, will yet make the removal of it waste." In *Jenkins* v. *Getling* (a^4), greenhouses built in a garden and constructed of wooden frames, fixed with mortar to a foundation of brickwork, were held to be "irremovable fixtures"; the boiler built into the floor of the greenhouse was also held to be an "irremovable fixture," but the pipes belonging to the heating apparatus and connected with the boiler by screws were held to be "movable fixtures." Vice-Chancellor Wood, in this case, after distinguishing the position of a tenant from that of an incumbent, as in *Martin* v. *Roe* (a^5) goes on to say:—"There is nothing to distinguish this case from *Buckland* v. *Butterfield*." The boiler appears to have been held an "irremovable fixture" mainly from a consideration of the *mode and extent of the annexation*. "It is not like a pump, easily removable. The question as to the hot-water pipes is more doubtful; although they are used as the means of circulating from the boiler, still they are connected merely by screws, and might very naturally and easily be altered from time to time, like gasfittings, and can hardly be treated as mere adjuncts to the boiler. I think, upon the whole, I must hold the pipes to be removable by the occupier." In *Grymes* v. *Bowcren* (a^6), the question was whether a pump attached to a stout perpendicular plank was a movable fixture. This plank rested on the ground at one end, and at the other was fastened by an iron bolt through the adjacent wall. The tube of the pump passed through a brick flooring into a well beneath, which had been arched over. The Court held that the pump was a "movable fixture." Chief Justice Tindal, in delivering judgment, said:—"Looking at the facts of this case, considering that the pump was one of *domestic convenience*, that it was *slightly fixed*, was erected by the tenant, *could be removed entire*, and that the question is *between the tenant and his landlord*, I think the rule should be made absolute." In *Hellawell* v. *Eastwood* (a^7), Baron Parke says:—"Now, in considering this case, we cannot doubt the machines never became part of the freehold. They were attached slightly so as to be capable of removal *without the least injury* to the fabric of the building or to themselves." With regard to the nature and character of the fixture, and the use for which it is intended, it may be taken as the result of the authorities that a fixture, in order to be "movable," must be of a chattel nature and character before it was annexed, or, at the least, must partake of a character independent of the soil. In the relation of landlord and tenant, but in that relation alone, the rule of law was relaxed for the encouragement of trade, it being very early perceived that it would be injurious to trade if a tenant were told that he must continue to conduct his trade with property which need not be fixed in any way to the soil, or he would at once be held to have made a present of it to his landlord. In the time of Lord Holt (*b*), such fixtures were movable by a tenant, and a series of subsequent authorities have established this general principle with respect to trade fixture. Lord Ellenborough, in the case of "Elwes v. Mawe" (*n*), also recognises the authority of the decisions in which fixtures, set up for purposes *not wholly* but in part connected with trade, have been held to be "movable fixtures." When a tenant is a nurseryman, and makes it his trade, he may remove trees (a8). Growing box cannot be removed by a tenant during his term. Mr. Justice Parke said:—"There is no authority for saying that an ordinary tenant may take up growing trees without a special agreement for that purpose"; and Chief Justice Denman:—"A border of box is a thing intended to be permanent." Justice Parke:—"It might as well be contended that a tenant could take up hedges (a9); for if there be a quickset edge of white thorn, if the tenant stub it up or suffer it to be destroyed, this is destruction" (b1). The remarks of Lord Kenyon, in "Penton v. Robart," and of Chief Justice Gibbs, in "Lee v. Risdon" (*supra*), are important on this class of questions. By reference to the cases already cited it will be observed that fixtures erected for *ornament and domestic use* have in certain cases held to be "movable fixtures." The Lord Keeper, in "Beck v. Rebow" (b1), decided that hangings and looking-glasses were only matters of ornament and furniture, and not to be taken as part of the house or freehold, but removable by the lessee of the house; and Mr. Justice Blackburn, in the case of "Parsons v. Hind" (b2), remarked:—"Where a chattel still remains a chattel, being merely fixed for *convenience*, like the clock in court, which although firmly fixed, and although probably it could not be moved without disturbing the plaster, yet no one could doubt it remains a chattel, and does not become a part of the freehold." In "Avery v. Cheslyn" (a2), it was held to be properly a question for the jury, whether a cornice was ornamental. In "Bishop v. Elliott" (b3), following "Leach v. Thomas" (b4) chimney pieces, if *ornamental* and not otherwise, set up by the tenant, are movable fixtures;" but it has been held that statuary and vases, which, although not affixed to the freehold, and resting only on pedestals, form part of the architectural design of a house, are distinguishable from mere ornaments and cannot be removed. It cannot be laid down with any certainty that the Courts would limit the power of a tenant to remove fixtures to the cases already mentioned, such a limitation would be incompatible with the application of the principle which has been laid down, and which is submitted as abundantly supported by recent authority. Nevertheless, these cases are valuable as indicating the policy pursued by the judges, and may be taken as authorities with respect to the particular circumstances to which they refer. It must, however, be here remarked that fixtures erected *for the purposes of husbandry* have been expressly excluded from the class of movable fixtures: therefore, agricultural tenants are not entitled to remove fixtures set up by them for this purpose. It is difficult to see how the distinction established by this case with regard to agricultural tenants is consistent with the principles of public policy which ostensibly formed the ground of the judicial decisions connected with *trade*, and other fixtures. Further, would any such strict line of demarcation as that attempted to be laid down by Lord Ellenborough between *trade* fixtures and *agricultural* fixtures receive the approval of the courts in modern times? It would, in fact, be difficult to distinguish in very many cases such fixtures as pertain to husbandry from those pertaining to trade, or to determine with any accuracy to which class the fixtures properly belonged. The Legislature has, to some extent, recognised the injustice inflicted upon agricultural tenants by thus excluding them from a participation in the advantages of what may be termed the emancipation of personal property from the denomination of realty. This result is entirely due to the policy of the judges in modifying by a series of decisions the operation of a legal doctrine which was evidently expedient. The policy of the courts has been deliberately sanctioned and adopted by the Legislature in respect to agricultural tenants, in two enactments, the former of which became law in 1851, and empowered a tenant, who, with the consent in writing of the landlord for the time being, has erected trade or agricultural fixtures, under certain conditions, to sever and remove them at the conclusion of his tenancy. The latter enactment is entitled "The Agricultural Holdings Act, 1875," and its provisions are intended to relieve agricultural tenants from the loss and injury to which they are subjected by the doctrines of the common law as expounded in the courts. These statutes seem to afford every encouragement and facility to parties so desiring it, whether by contract or otherwise, to render inoperative the important principle involved.

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* A paper read by J. Shalman Smith, barrister-at-law, before the Institution of Surveyors, Nov. 24, 1879.

Lastly, with respect to Assessment of Fixtures. Whatever is fixed to the realty so as to be irremovable as between landlord and tenant must be taken to be part of the premises, for the purpose of ascertaining the rateable value of the property (b5). The right of a tenant to sever and remove fixtures does not for certain purposes affect the character of the fixture as a part of the soil to which it is annexed. By the exercise of the right of severance the fixture becomes a chattel, and subject to the incidents of a chattel. Nevertheless, until that right is exercised, the general rule of law still obtains, that, when a tenant annexes articles to the demised premises during the term, such annexations or "fixtures, become part of the freehold (b6). The tenant is, moreover, liable to be divested of his right, should he not exercise it within certain prescribed limits; in such case the property in the fixture will pass to the owner of the soil to which it is annexed. It will be necessary to refer more particularly and in detail to the consequences of a neglect on the part of a tenant to exercise a right of severance within the limits prescribed by law. Lord Justice James, in *ex-parte* Daglish (b7), has thus stated the law on the subject:—"In the case of a freehold, the freeholder has exactly the same interest in everything attached to the freehold as he has to the brick and mortar themselves, which make up the walls of the freehold. But that is not the case with respect to a tenant who has a limited interest—it does not signify what that limited interest is—in the soil and the buildings, and who has besides an absolute interest, a complete and *unqualified property* (unqualified except as to this, that he must remove it before the end of that term), *in the fixtures as distinct from the interest in the land*. This interest is a thing which he can part with, a thing which his creditors can seize, and a thing which is liable to execution as against him just as much as the chairs and tables in his house." Where a yearly tenant of a house had at his own expense hung bells, but quitted the premises without removing them, it was held that, by remaining fixed to the freehold *after the expiration* of the term, they become the property of the landlord, and that the tenant could not maintain trover for them after the landlord had severed them from the freehold (b8). In the absence of special contract, tenant's fixtures cannot be removed after the termination of the lease, and this rules applies whether the lease determines by *effluxion of time* or by *re-entry on forfeiture* (b9). The result of the authorities may be stated (c) first, that fixtures go, at the expiration of the term, to the landlord, unless the tenant has, *during the term*, exercised his right to remove them; secondly, that the tenant may remove the fixtures, notwithstanding the term has expired, if he retains *possession of the premises* (c); thirdly, that his right to remove fixtures after his term has expired is subject to this further qualification—viz., that the tenant continues to hold the premises under a right still *to consider himself as tenant*."

The right of a tenant to sever and remove "movable fixtures" is frequently governed by express covenants (c3). When this is the case, the rights of the parties will of course depend upon the legal construction of such covenants. A general covenant to repair extends not only to buildings but to fixtures, and a tenant is precluded by such a covenant from removing fixtures (b) (f). A tenant may also deprive himself of his right to remove fixtures by undertaking to repair, and *yield up* in good repair, improvements and fixtures. A tenant covenanted "to repair the devised messuage, and premises, and all erections, buildings, and *improvements* which might be erected thereon during the term, and *to yield up* the same in good repair, &c." It was held that a *verandah*, erected during the term by the tenant, fell within the terms of such a covenant (c4), and could not be removed. A *greenhouse*, although erected with a view to removal, has been held to be an improvement within the meaning of such a covenant (c5). A *plate-glass shop-front*, in lieu of an old window fixed to the freehold by wedges only, has been held to be included in the word "improvements" (c6). But where general words follow the enumeration of specific articles, the general words are construed as relating to the same class of articles as those specifically enumerated. Thus, in a covenant by a tenant to yield up, at the expiration of his term, the premises demised, together with all "locks, keys, bars, bolts, marble and other chimney-pieces, foot paces, slabs, *and other fixtures and articles in the nature of fixtures* put up during the term, it was held that neither tenant's fixtures nor trade fixtures were included in the covenant (c7) There is another important result of a general covenant to repair which must be noticed here. If a tenant on the determination of his tenancy, takes any fresh interest in the premises, he should take care to reserve expressly his right to remove those fixtures which he had, under the old tenancy, a right to sever and remove, otherwise the tenant may lose his property in them altogether; and it may be generally stated that the right of a tenant to remove fixtures may be divested by *any* new agreement for the use and employment of the land in which there is no mention of the fixtures. Suppose a tenant from year to year, or without any express covenant to repair, erects structures or improvements, and subsequently takes a lease of the same premises, with a general covenant to repair, the lessee would be restrained from removing those fixtures at the determination of the tenancy so created, although he might have removed them previous to the commencement of his lease (c8). Where the outgoing tenant stipulates with the incoming tenant for a purchase of the fixtures at a valuation, the landlord should, in all cases, be made a party to such an agreement; otherwise, if the fixtures are allowed to remain until the incoming tenant has taken possession, the landlord may dispute the right of purchase and sale, and claim the fixtures on the ground that the outgoing tenant has divested himself of the right to remove the fixtures by neglecting to exercise his right during the term.

Authorities Cited.

[For other cases quoted see similar lists to first and second parts of paper, pp. 639, 674.]

(b6) Poole's Case, 1 Salk 368.
(b7) Ex-parte Daglish, 21 W. R; 893, 29 L. J. 168.
(b8) Lyde v. Russell, 1 B. and Ad. 394.
(b9) Pugh v. Arton, 8 L. R. Ex. 626.
(c1) Heap v. Barton, 12 C. B. 274.
(c2) Penton v. Robart, 2 East. 88.
(a2) Avery v. Cheslyn, 3 A. and E. 78.
(a3) Rex v. Otley, 1 B. and Ad. 161.
(a4) Buckland v. Butterfield, p. 14.; Jenkins v. Gething, 2 J. and H. 520.
(a5) Martin v. Roe, 2 Joh. and H. 526.
(a6) Grymes v. Boweren, 6 Bing 440.
(a7) Hellawell v. Eastwood, 6 Ex. 312.
(a8) Wyndham v. Way, 4 Taunt, 316.
(a9) Empson v. Soden, 4 B. and Ad. 655
(b1) Co. Litt. 53a.
(b2) Beck v. Rebow, 1 P. W. 94.
(b3) Bishop v. Elliott, 11 Ex. 113. Parsons v. Hind, 14 W. R. 860.
(b4) Leach v. Thomas, 7 C. and P. 328.
(b5) Chidley (app.) v. Churchwardens of West Ham (resp.) 32 L. T. N. S. 488.
(c3) Naylor v. Collinge, 1 Taunt 19.
(c4) Penry v. Brown, 2 Stark N. P. C. 403.
(c5) West v. Blakeway, 2 Man and G. 729.
(c6) Hazlett v. Burt, 18 C. B. 893.
(c7) Eliott v. Bishop, 11 Ex. 113.
(c8) Thresher v. East London Water Works Company, 2 B. and C. 608.

At the Institution of Surveyors, 12, Great George-street, Westminster, on Monday evening, the 8th inst., the adjourned discussion took place upon the above paper.

Mr. Ryde, V.P., occupied the chair, and, in opening the subject, expressed his regret that the author had dismissed the subject of the rateability of fixtures in a single sentence, for it was a point of great practical importance to the profession.

Mr. E. Vigers expressed the indebtedness the members felt to Mr. Smalman Smith for bringing so delicate a subject into the narrow limits of a paper. His own definition of a fixture would be: What was appropriated to a freehold, not what was simply affixed to it.

Mr. H. Shield thought that the author had so arranged his subject as to convey a clear and harmonious view of the intricate law of fixtures as at present laid down in the courts. A question not touched on, but of great importance, was whether a property was enhanced in rateable value by having a fixture annexed to it. The recent case of Lang v. The Overseers of Bishops Wearmouth, which had occasioned much comment in the North of Exgland, had been supposed to settle this in the affirmative; but, on examination of the case in detail, it appeared that the appellant failed in his application to the Court of Queen's Bench,—in which he, a ship-builder, sought relief from rating for certain machines, alleged to be fixtures, employed in his business—by reason of a clause in the statement of the case that the machines were intended for permanent use in the business, declared since to have been made in error, but one which at once put the appellant out of court. He considered that the question of rating turned on what a landlord would provide for a tenant; what he did not usually supply ought to be omitted from consideration in the rating of hereditaments.

Mr. Lofts considered that in household fixtures the safest guide in the decision of questions between landlord and tenant was the surrender clause in the lease. He should classify fixtures as movable and immovable; the latter being the landlord's, the former the tenant's fixture. It was very desirable that inventories of fixtures taken over should be preserved for future guidance as to the party to whom they belonged.

Mr. Castle, speaking as a lawyer, would remark that for every single case reported in the law books there would be thousands in the memories of surveyors. For guidance in a matter, a solicitor or barrister would do best to learn from the surveyor concerned what was the actual practice in his profession in such a case, as the decisions in the courts were largely governed by "custom." The paper had given them a reduced plan of the law of fixtures, and, as usual in such delineations, some points had been dwarfed—as, for example, rateability—and others made unduly prominent. An important point was that an assignee of a tenant had greater powers of removal of fixtures than the tenant himself, for even when the lease had been surrendered by the tenant it had been held that the assignee could step in and remove such fixtures as belonged to the tenant, while after surrender the tenant himself was precluded from taking away his fixtures from the incoming tenant.

Mr. Robert Mann observed that the paper gave a legal, but not a practical, view of the question. He thought the chief difficulties between landlords and tenants as to freehold fixtures arose when the respective parties called in their solicitors—an assertion which provoked laughter and cheers. He could see no advantage in changing the designation of fixtures from landlord's and tenant's to movable and immovable, as proposed by Mr. Smith, for the old name told at once to whom the property belonged. The alteration, if any were necessary, should be to freehold and leasehold fixtures. The practical and best mode of diminishing disputes as to these matters, was to make out a schedule of fixtures when tenancy was commenced. Twenty-five or 30 years ago it was customary for tenants to provide meters, gas and water pipes, bells, stoves, and all other fittings; nowadays the competition between speculative builders induced them to provide these in houses, ready built-in—but they were none the less tenants' fixtures, although it was the custom to leave them in as not worth the trouble and cost of removal. If a tenant changed a landlord's fixture for a better article, such as a mantelpiece, his safest course was to make a special agreement with the landlord about it beforehand, undertaking to reinstate the former one, or the landlord could claim the better one without paying compensation.

Mr. W. G. Harrison, Q.C., said if this paper gave the law, as Mr. Shields had pronounced it did, as an harmonious whole, he could only add "God help us," for it seemed to him a hopeless muddle. If he met with any variance of opinion as to fixtures the first suggestion a lawyer would make would be to refer it in place of going to law, for the decisions were so various and based upon such a variety of circumstances that no one looking at a recorded decision could say how the next case, precisely similar in conditions though it might be, would go. As for the paper, very many of the "authorities" quoted were not authorities at all. Look at the dogma in the first sentence, "*quicquid fixatur solo, solo cedit.*" What! If a man were to nail an old hat to a tree at the bottom of his garden for his boys to take pot shots at with a pistol, the hat became the landlord's, and a fixture that the tenant could not remove till it rotted from the tree! On that principle a carpet was a fixture, although one might wish to take it up and dust it, a clock, and so were many other mere fittings. Mr. Justice Giffard had, the author mentioned, decided in *ex parte* Ashbury that duplicate rolls passed with a rolling machine. Now, he would suppose that a barrister chose to have similar locks on his chambers and private residence, so as to make one key available for both; if he, as tenant, chose to have several duplicate keys fitting both, whose fixtures would they become if he gave up the house or the rooms? They had only to apply this to the rolls and imagine the manufacturer had a second machine at other works to which the same rolls were fitted to see the *argumentum ad absurdum.* True, Mr. Smith gave as a better reading afterwards, *quicquid plantatur solo*, &c., but that was scarcely enough. To be an irremovable fixture a chattel must be incorporated with the soil, not merely affixed to it. He heartily agreed with the suggestions made by previous speakers that all fixtures ought to be made the bases of agreements. But the whole question was first one of facts, and then secondly one of agreements, and each case, they might depend upon it, would he decided, not so much by the precedents that had been quoted, but by its own surroundings.

Mr. Tuckett said there was some truth in what the last speaker had said; but if a surveyor was called in to value the articles in a house, however sound his commonsense might be, he soon became a nuisance to everybody, unless he knew the present state of the law as to fixtures, and such a summary of the legal aspect of the question as Mr. Smith's had, therefore, practical value. It called attention to the important distinctions between what were regarded as movable, and what as immovable fixtures in the several relations of landlord and tenant, of mortgagor and mortgagee, and of a failed firm and the assignees of a bankrupt's estate. He wished a list had been given of the most reliable textbooks, which such a paper by no means superseded; he had found "Brady on Fixtures" the best (Mr. Harrison suggested Amos's work). He thought the author had not thoroughly carried the principle of "intention to annex" through the latter part of his paper, many of the decisions seeming to contradict what had been enunciated as highly important. It must not be forgotten that the customs as to fixtures were established by independent valuers and surveyors, coming to conclusions very often from their own notions of justice between the parties without reference to recorded cases, and that there was a growing tendency on the part of the courts to interpret more liberally than before, and they gradually leaned towards these valuers' arrangements. He had not seen any recorded case as to bank-counters and counting-house fittings, matters which raised difficult questions where banks had failed.

Mr. Neve, Mr. Edwin Smith, and Mr. Watney having spoken on the case of Chigley v. the Overseers of West Ham, which appeared to run counter to previous decisions as to the rating of fixtures, Mr. Smalman Smith replied upon the discussion. He had been reminded that fixtures were a question of fact and not of law, but of what use was it determining isolated facts unless you had a theory to guide you, or unless you could make use of them in future practice? His object had been to reduce these complicated facts to a system, and in this he claimed he had not been altogether unsuccessful. In passing, he must mention the name of one judge who had done more than any other person to determine the law on this subject, viz., Mr. Justice Blackburn. In his paper he had tried to show that three questions governed the movability or otherwise of fixtures: first, and most important, the position in which the parties stand to each other; next, the mode and extent of annexation; and lastly, the value and purpose of the property. In reply to Mr. Harrison, he must point out that he only quoted the rule *quicquid fixatur solo, solo cedit* as a feudal maxim that had become nearly obsolete, having been varied to *quicquid plantatur*, &c. If fixtures were made the subject of schedules, all would agree that disputes would be greatly diminished, and he would suggest to the Institution that the Council should endeavour to formulate some comprehensive schedule of fixtures that should have the happy result of reducing matters of variance.

The Chairman, in closing the discussion, remarked that when a solicitor asserted that the question was a "hopeless muddle," and a surveyor regarded it as a "delicate case," it was evident that the consideration of fixtures was complicated. He should have divided it, had he not been in the chair, into three parts:—1st, What was a fixture? 2nd, In whom is the property of a fixture vested? and 3rd, What part does the fixture play as a portion of a rateable hereditament? Common-sense would exclude from the list of fixtures anything which was neither fixed nor annexed, and would say that those things which were irremovable belonged to the landlord. Mr. Mann had carried the tenants' right so far as to say that bells and stoves, &c., built into a house, were the tenant's, because they were formerly supplied by the tenant; but he was sure that, if such a rule was attempted to be enforced, much unpleasantness would arise, and the courts would not sustain the claim. The whole discussion had shown the desirability of making definite schedules of all fixtures.

At the next meeting of the Institution, on the 5th January, Mr. E. R. Robson will read a paper on "The Purchases of the London School Board."

NOTES FROM EDINBURGH.

THE building operations of the year about to close have been considerable, and there is promise of at least nothing worse for its successor. A fair average of progress has been made in carrying on extensions, which the stagnation of trade might have been expected to discourage and defer till better times. But everywhere large additions have been making, both to the street and villa accommodation of the city and suburbs. The long street on the Warrender ground, facing the meadows, has been completed, and has made some progress in its return south. These houses are on the flat system, and the plan of making direct communication in all such tenements between w.c. and the air outside the room itself seems to have been abandoned in despair. Externally this street is ornate, rather more so than most houses in the Scotch Baronial; and the only objection to their arrangement here is that they are (at least for all the lengths) just one story too high for that high top-story style. In the northern limit, at Inverleek-road, similar tenements of plain but commodious character have been erected. In Mancheston Park large houses of a higher grade have been begun. The style is far too cumbrous and bulky, and not at all consistent with the villa architecture or the old castle beside it. Two churches have been opened, and three are approaching completion. The U.P. congregation at Morningside have begun the building of a large and imposing erection in the Norman style, and have taken a step in the right direction of reducing the joinery and plaster work to a minimum. A new church is shortly to be begun in Daly, and another in the Ferry-road, for the Free Congregation of Granton and Wardeen.

Alterations on existing properties have bulked very largely. The cheap price of labour has contributed to swell this important and expensive item. Masons have been getting 6d. and joiners 5½d. per hour. It is often little less than marvellous to see the rapidity with which a large gap is made and then re-filled. Such re-constructed fronts, however, are mostly confined to the western thoroughfares, and are interesting as marking the development of business in the city and the manner in which architecture meets the demand made on its resources. The plate-glass shop-window-front is so stereotyped in its design that most of this work is probably left to the builder, and, generally speaking, much elegance and taste are displayed in the variety—if it were nothing else—of the design. When, however, a whole tenement is removed and a new front appears, as has now been for many years a common incident in the history of such thoroughfares as Princes-street and its continuation, the architectural effect is thrust upon the notice, and one can easily observe that the reconstruction is always in the direction of a much more ornate style than what would have been thought of 30 or 40 years before. Oriel projections, bulky trusses, freely-indulged carving, figure-heads, and other methods of decorating the wall surface have, to a great degree, superseded the classical simplicity of the older style, and there is hardly a bit of the wall left for what Mr. Ruskin calls the "sleep of the sunshine." One remarkable feature in these reconstructions is the all but universal failure of the design where it has to treat the doorway under the novel conditions imposed upon it by the supremacy of the plate-glass shop-fronts. With exception of the large and lofty tenements designed for Chambers-street, and in which the doorway is wisely subordinate, the design adopted in almost every case is the reverse. In such buildings as the Albert Hall, the Alexandra Hotel opposite, the Osborne Hotel, and others, the doorway, having got its old-fashioned treatment, looks always as if it had no constructive relation to the structure on either side and on the same level as itself. This disjunction is always painfully incongruous, and there is no remedy left but a graceful retirement of the doorway from competition with the more slender proportions of the shop architecture at its side.

Doorways certainly do not appear to any advantage in some very recent reconstructions, such as that of the Caledonian Insurance Offices and a tenement opposite them, in George-street. In both the doorway goes far to mar the whole design, and indeed it looks as if there were something in the nature of things to create a tendency to stumble at the threshold. The Caledonian Insurance was a very good sample of a Classic design by the late Mr. Bryce, and its range of Corinthian pillars has been extending over the adjoining tenement with very good effect; all it wants is a balcony on the uppermost story, which looks unfinished as it is. The doorway, however, has been made far too prominent a feature, and its needlessly florid decoration makes it still more obtrusive, and quite inconsistent with the classical simplicity of the order overhead. The projection which seems to have been necessary for a staircase is not commensurate with the columnar superstructure. This defect, however, is happily lost in the perspective of either side.

In the building opposite, the whole design has provoked, and justly, much hostile criticism, and certainly there is no frontage of the same extent within the city which exhibits so many eccentricities in the way of violation of the ordinary proportions in the design and disposition of its parts. The internal arrangements have, no doubt, been the principal thing in the eyes of the proprietor, who has probably been his own architect in everything but the details of decoration or construction. The design, stripped of its superficial detail. is suspiciously like some of the designs supplied for the instruction of the youthful architect in the nursery, with exception of its doorway, which is placed where no doorway should ever be, partly below wall and partly below window. The ground-story is very much lower than those of the tenements at its side, and lacks the necessary height proportionate to the number of stories overhead. The tripartite division of the fenestration, it is easy to see, has been one great source of error, and another is the inevitable oriel projection. These have occasioned abnormal width in the windows, which even the mullion cannot conceal, and these disagreeable proportions are repeated till the pyramidal pile reaches the preposterous height of six stories, and the ceiling rises to the level of the chimney cams. All these are duly decorated with the usual members—cornices, pediments, niches, crosses, and garland, against the chimney stacks; but this example is instructive, as teaching forcibly the lesson that no amount of even well-selected decoration can compensate for the appearance of structural improprieties, or any great departure from the simple proportions which ordinary Classical examples generally fix once and for all upon the mind.

The law of decorative design, and the readiness with which it can be supplied without much labour or design, is a great temptation apparently to forget that architecture, as distinct from mere building, joinery, or plastering, is the art of proportioning the forms of the details, and that of each in its relation to the whole, and without this much at least, there is no architecture at all. Even in street architecture, this is all the more imperative, because any important frontage ought to harmonise with the most characteristic architecture beside it. Violent contrasts are rarely pleasing, even when the individual example is in itself a complete and harmonious whole.

The Edinburgh Theatre has been reconstructed internally, to be the headquarters of the U. Presbyterian Church. The gaunt vacuity of its monster windows has been partly relieved by mullioned tracery and transoms, but the structure will for ever remain an oddity, another example of perilous experiment in defiance of the ordinary rules for proportion in the magnitude and disposition of its parts.

The Hospital for Incurables is completing and is a very instructive contrast to these notable examples, in faithful adherence to what may be called a pure study of the beauty of proportion in details.

The year will be most remarkable as that which witnessed the completion and opening of the New Infirmary and Cathedral Church by the late Sir G. G. Scott. The former has been erected in the light of a wider experience and has a more complete arrangement than any other institution of the kind. The cost, which is about £35,000, is nearly all subscribed and paid; but £30,000 is still required to make it free of debt.

The opening ceremonial of the cathedral was worthy of the greatest undertaking in the way of church building that has been thought of in Scotland for centuries. About 2,500 clergy and laity attended, and as many more would have sought, if they had had any chance to gain, admission.

Another instalment of restoration of the rival edifice, the Cathedral of St. Giles, has been made this year, and the opening up of the south transept or aisle has given more accommodation, which has been readily taken up. On more than one occasion the dignitaries of St. Mary's and the Presbyterian Bishop of St. Giles eloquently buried the hatchet. Something like an apology was made even for Jenny Geddes, which might very safely and gracefully be done when the populace of Edinburgh now flock in numbers to listen to the "mass book" which she could not sit to hear. The grounds of the cathedral are being laid out. Eighteen trees, planted by as many bishops or representatives, adorn the straight walk between Melville-street and Palmerstone-place. The railing is of wrought iron, with very elegant piers at intervals, and small low gateways. It would take a number of the Building News to give anything like a description of this great work, and all the principal details have been already at different times, as indicated recently, placed before its readers. It may, however, be stated generally, with perhaps more of detail at another time, that the interior, at least, far surpasses the expectations that had been formed of the imposing grandeur of the whole design. From the light but massive piers of the arcade to the lace-like edging of the Norman ornaments in the clerestory there is a unity of design not to be found in any of the ancient buildings, and there is something very striking in the contrast also between the lavish decoration of the marble and stonework which make up the whole, and the joinery and plaster of the most capacious of Presbyterian churches.

The School Board have in course of erection two new schools—one for the Cowgate and the other for Lothian-road district. Economy has been made matter of discussion, as the original schools were considered, but not fairly, as prices and circumstances were peculiar, very extravagant. The architecture, judging from the Lothian-street sample, is not improving. Several of the original schools were not at all improved by introduction of Gothic detail in window-heads, &c., which only looked ridiculous in contrast with the real thing in the schools by Mr. Anderson; but the building now erecting in Lothian-street goes far beyond these pseudo-Gothic experiments in its treatment of such details as doors and windows. The site is a splendid one, and the tower-like portion has been placed next a high tenement, where it has little effect. The windows are the most perplexing study; and if any urchin leaves his marbles to speculate on the reasons why there are so many various specimens of the architecture of the lintel, it is to be hoped that he may not wait for information till an elementary knowledge of architecture becomes a branch of education in the school. We have the true Gothic arch in the doorway, and nowhere else till the topmost story is reached. The plain lintel is also here, and the mullioned window. The segmental-headed window appears also. Then there is the low-centred, arched lintel, obtained by nearly cutting out all the stone where depth of stone is needed most. There is also a very curious and unexampled specimen of the corbelled lintel. This is very ingeniously designed to represent the weatherworn window of similar kind in the old castellated mansion, or the donjon keep, and must strike even the juvenile mind as being extremely ugly and shapeless. Altogether, it is a very instructive example of the sense and nonsense of design in the matter of window-heads; but if the light admitted is sufficient, the School Board may forgive the nonsense, even if not economical.

SKETCHING FROM NATURE.

THURSDAY week's evening lecture at the London Institution was delivered to a crowded audience in the theatre by Mr. Walter Severn, on "Sketching from Nature," and was practically illustrated. The art of painting in water-colours in direct imitation of nature, he remarked, was, in its origin and present perfection, emphatically English. As Mr. Ruskin had said, it was only by rapid and frequent sketching that it could be acquired. The sketcher should study comfort in his arrangements, that there might be nothing to distract his attention from his work. The lesson should not exceed about two hours and a half. Having chosen his subject, he was himself in the habit of erecting his umbrella tent, such as they saw pitched on the platform, and to seat himself on his canvas-covered tripod, with all needful appliances of his art well in hand. The lecturer gave instructions as to the arrangement and mixing of colours, with useful cautions against mistakes to which learners were liable. He made remarks on the painting of shadows—such as that in the afternoon and at sunrise they should be painted cool, but warm in broad daylight. Thence he passed to show the various ways of rendering the lights, with observations on stippling, hatching, rubbing, and taking out, recommending the student to provide himself with plenty of clean rags. The lights and shadows should be graded. Glazing was explained as the putting of one colour underneath another, instead of mixing the two; to this practice was due the permanence of the works of the old masters, owing to their having escaped the chemical changes caused by mixing the colours. The effects of glazing Mr. Severn illustrated by a sketch of his own—a cliff scene in the Island of Sark. A few words on tone followed. To catch the idea of tone, the learner should look at nature with the eye of an engraver who has to reproduce a scene without the help of colour. The lecturer then approached what he termed the somewhat alarming subject of perspective, abstaining from the geometrical treatment of the problem, and showing how much might be done with the help of a carpenter's rule. The student should try to make his picture tell a story, if only the incidence of a sunbeam. He should learn from failures as well as from successes. If self reliant and animated with the true spirit of art, his "flukes" would be systematised and ripen into real mastery of the principles of success. The rules of art were few and easily learnt, and good painting generalised the facts in a short and simple way. Real art was nature distilled in man's alembic. No two artists saw nature in exactly the same light, yet all copied her conscientiously. Let them take as examples De Wint, Cox, Turner, and Müller. In conclusion, he urged all students present to lose no opportunity of observing nature, and to take plenty of notes. They would thus be never less alone than when alone.

A SUBTERRANEAN PALACE.

A CORRESPONDENT of the *Sheffield Telegraph* gives the following description of Welbeck, the Nottinghamshire seat of the Duke of Portland:—The grounds seem to be literally undermined. Extending in all directions from the abbey are burrows or passages; not mere borings or excavations, but lofty, spacious passages, brilliantly lighted by costly apparatus for letting in sunlight, and, where sunlight cannot be admitted, by lights from gas. By an underground passage we come to the celebrated riding-school, the like of which is not to be found in Europe or in the world. It is entered by a trap-door, opened by means of a curiously-designed crank in the passage. In the days of the Duke of Newcastle it was used as a riding-school; now it is a magnificent museum of art over 180ft. in length. Hundreds of pictures are arranged—not hung—round the gallery, and piled in stacks on the floor are thousands of volumes of books, some modern, and many old, rare, and valuable. The floor of this gallery is of oak, and the ceiling is made to represent a brilliant midsummer sky. Mirrors in profusion are placed about, and light is shed from four chandeliers suspended from the roof, and each weighing a ton. This apartment is lighted up by over 2,000 gaslights, and, when all are illuminated, the effect must be extremely brilliant. There are some miles of passages under the grounds. One extends from the abbey half the way to Worksop. Another was used only by the Duke of Portland. The passages are all broad enough for three people to walk abreast in them, and pleasant to walk in. The library, like the picture-gallery, is underground, and is the work of many years. It is divided into five large rooms, and so arranged as to form, when desirable, one very large room. The library is 236ft. long. Another immense and superbly-constructed room has been erected underground. At one end it is approached by a spiral staircase, and at the other by subterranean passages. Church or ballroom? It would do admirably for both. It was begun five years ago, and is left in an incomplete state. There are many of these rooms at Welbeck; they are free from draughts, admirably lighted, magnificently decorated, and all very costly. Comparatively few outbuildings are to be seen. The most remarkable is the new riding-school, a building of gigantic proportions and of extraordinary beauty. The walls are solid stone, and the roof of wood, iron, and glass. It is nearly 400ft. in length and 100ft. wide, and divided into a great centre and two aisles. The central department is decorated with a frieze of painted brasswork representing birds, beasts, and foliage, and of perfect workmanship and elegant design. It is 50ft. high and lighted by 8,000 gas jets. Here the Duke took pleasure in seeing his horses exercised. The "works" are marvels. He employed constantly upon them over 2,000 workmen. In fact, Welbeck was like an industrial village.

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A SIMPLE TAP FILTER.

THE filter illustrated in the annexed engraving is, according to the *English Mechanic and World of Science*, of the class especially adapted for attachment to an ordinary supply tap in such a manner that either filtered or unfiltered water may be drawn as desired. It has been patented in this country by Mr. Jott Grant, of Boston, Mass., and the feature of novelty is the inclosing of a hollow globe in a spherical casing through which the water passes. The globe has a tube through its centre, thus leaving a free passage for the water when the globe is turned in the proper direction. The space within the globe around the tube is filled with a filtering mixture, to which the water has access through strainers placed in orifices made in the sides of the globe. The invention also consists in the method of attaching the handle to the filtering globe. Fig. 1 is a section of the filter, showing the hollow tube through which water has a free passage when it is not desirable to filter it; Fig. 2 is a section, showing the globe so turned that the water must pass through the filtering mixture.

FIG. 1

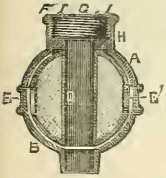
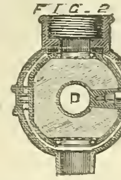


FIG. 2



A and B represent two hemispherical cases, which when secured together form a hollow chamber for the reception of the metallic globe. The globe has a tube, D, passing through its centre, which allows a free passage of water when the globe is turned to the position shown in Fig. 1. The space within the globe and around the tube D is filled with charcoal or some other suitable filtering mixture. E and E' are two strainers, which serve to allow the passage of water, and also to prevent the charcoal from coming out. When the globe is turned to the position shown in Fig. 2 it becomes a filter, the water having to pass through the filtering mixture before it can escape. The neck H of the filter may be made with a screw as shown, or any other coupling device may be used. K is a handle which passes through the shell B into the globe, and serves to operate the same.

BOOKS RECEIVED.

The third part of *A Grammar of Japanese Ornament and Design*, by T. W. Cutler (London: B. T. Batsford), though hardly coming up to the general standard of the two preceding parts, is still very interesting, and the examples well chosen.——*Money*, by James Platt (London: Simpkin, Marshall & Co.), is another collection of concentrated commercial wisdom, by the author of "Business," and "Morality." The two last named are generally held useful, simply as means to get the indispensable requisite which gives the title to Mr. Platt's new book, but his counsels have wider and better aims, are always well meant and mostly well expressed, and will help many a young business man not merely to make money, but to keep his morality intact while he increases his business.——*The City Diary for* 1880 (London: W. H. & L. Collingridge) makes its seventeenth annual appearance in its usual useful form.——*The Financial Reform Almanack for* 1880 (London: Longmans, Green & Co.) is truly a suggestive reminder. Most people will rather shrink from the contemplation of the burdens ready for the new year enumerated in the pages of this annual, knowing but too well there is—for the present at any rate—no chance of their diminution.——*Elementary Lectures on Christian Architecture* and *Eastern Cities and Italian Towns*, by R. P. Pullan (London: Edward Stanford), are collections of articles contributed by the author to some of our contemporaries. Published in book form, they will probably obtain, as they deserve, a wide circulation. Mr. Pullan never writes beyond his knowledge of his subject, is seldom uninteresting, and his chapters are pervaded throughout by the evidences of artistic culture, and a deep fund of information.——On page 691, when noticing Messrs. Longmans' edition of *Lalla Rookh*, illustrated by Tenniel, we stated the book was published at a guinea. Messrs. Longmans, Green and Co. have written us that this was an error, the price being half-a-guinea. All we can say is, our mistake was a very excusable one.——*Bevis's Improved System of Bookkeeping, specially adapted to Builders and Contractors* (London: Bevis and Co.), has reached a third edition, and will probably see many more.

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COMPETITIONS.

Newcastle-on-Tyne.—The committee of the Larkin Memorial met at the *Chronicle* Offices on the 4th inst.—Mr. Cowen, M.P., in the chair. Mr. Kirton laid before the committee several designs, which were considered. Upon the motion of Mr. George Rule, who attended on behalf of Mr. Crawshay, the design of Messrs. Oliver and Lesson, architects, was adopted, and Mr. Kirton was requested to take the matter in hand and carry it into execution.

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ACHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Leeds Architectural Association. — The annual conversazione of this association took place last week. In the absence of the President, Mr. George Corson, one of the Vice-Presidents presented the Association prizes for the past year, as follows:—The Association silver medal, awarded to Mr. George Beaumont, for measured drawings. Prize of Sir Gilbert Scott's "Lectures on Architecture," given by Mr. J. Tweedale, for design for a mechanics' institute, awarded to Mr. W. Riley. Prize of Gwilt's "Encyclopædia of Architecture," given by Mr. H. Walker, vice-president, awarded to Mr. W. Riley, for sketches of class meetings. Prize of "Landscape Painting in Water-Colours," by Barnard, and Stuart and Rivett's "Antiquities of Athens," given by Mr. A. Crawford, president, awarded to Mr. W. Riley, for figure drawing from the cast. Viollet le Duc's "Habitations of Man in all Ages," given by Mr. W. H. Thorp, awarded to Mr. W. Riley, for drawing of an old oak cabinet. Prize of a guinea and a half, given by Mr. J. Tweedale, awarded to Mr. J. Jackson, for drawing of a mechanics' institute (forwarded by the secretary). Prize of one guinea, awarded to Mr. H. Brown, for sketches at class meetings, given by Mr. A. Crawford.

Royal Asiatic Society.—At Monday's meeting of the Royal Asiatic Society, held at its rooms, 22, Albemarle-street, the President, Sir H. C. Rawlinson, K.C.B., in the chair, a paper was read, contributed by Babu Lajendralala Mitra, "On the Age of the Temple Caves at Ajanta," in which it was maintained that this question could be set at rest by the evidence of the inscriptions to be found in many of them, which showed, as he adduced, grounds for believing an antiquity as early as the 1st century of the Christian era. On the other hand, Mr. James Fergusson, who was present, and whose work on the cave architecture of India is regarded as the great authority on the subject, contended, in reply, that the architectural details clearly proved that the most important of them were formed as late as the middle of the 7th century.

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SCHOOLS OF ART.

Barnstaple.—The second annual distribution of prizes and certificates to the Local Schools of Science and Art took place on Monday week. The report for the past year was on the whole satisfactory, but stated that the school was still about £20 in debt; the work of the teacher, Mr. Joseph Kennerley, was referred to in commendatory terms. The awards included third grade prize for modelling and one for outline foliage from nature, and six second grade prizes, besides numerous certificates. In architectural designs Mr. Parks was placed by the Local Committee first, and F. W. Petter second; in artisans' drawings of historic styles W. Cowie stood first, and F. W. Petter again second.

Hull.—The annual prize distribution was made by the Mayor on Wednesday week. The committee report stated that the school had done good work during the year, and that it was anticipated that by another year the school would be in easy circumstances, and the building free from all incumbrances, and the property of the Literary Society, when it is expected that the institutions will be amalgamated. In referring to the large number of works now exhibited the committee alluded to two points as showing improvement—the large number of works of a truly artistic character, and the greater number of studies from nature and the model over former years. Two new classes in solid geometry and painting on china have been formed during the year. The report of the head master, Mr. J. Menzies, showed an advance in the number of second grade prizes obtained, and that two Queen's prizes and nine third grade prizes were obtained in the national competition, while at the May examinations one national scholarship, one local scholarship, 17 second grade prizes, and 40 passes were obtained.

Salisbury.—The prizes gained by the students in the School of Science and Art were distributed on Wednesday week by the Countess of Pembroke. The 14th annual report of the committee spoke of a course of satisfactory work which, if unmarked by brilliant success, was yet full of hope for the future, and free from present drawbacks. The attendance of students had continued to increase, especially in the mornings, and there were now 155 receiving instruction. The unprecedentedly large number of 1,893 drawings were sent to South Kensington in April, from which 22 were selected for national competition. To these 17 awards were made in the third or highest grade to nine students, two of the nine obtained national medals—one silver for a study from life, and one bronze for wall decoration design. In the May examinations 44 students passed, several in more than one subject, and 13 prizes were obtained—the same number as last year. This year the local prizes have been adjudicated upon by an entire stranger, the master of a London school of art. The science classes had also been successful.

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A third memorial stained-glass window has just been placed in the chancel of the parish church of Burnham, Essex, in memory of the late Mr. and Mrs. Clay. The window is of two lights, of which one is occupied by a representation of the Saviour, and the other by St. John the Divine, while in the tracery above are the monograms IHS and AΩ, with the Agnus Dei in the centre. The window was executed by Messrs. Cox and Sons, of Southampton-street, Strand. The other five chancel-windows have been restored at the cost of Sir H. Mildmay by Mr. Chas. Read, of Burnham, and are filled with delicately-tinted cathedral-glass.

The second portion of the Alexandra Estate, Wood Green, was sold last week at a total sum of £7,416 for the 84 plots, by Mr. E. E. Croucher.

Mr. George Ford has been elected city surveyor, at St. Alban's.

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ILLUSTRATIONS.

MOSAIC PAVEMENT OF CHANCEL IN CORK CATHEDRAL.—CHURCH OF ST. MARY, WOOLWICH.—NORTH LONDON CONSUMPTIVE HOSPITAL.—THE GEO. A. CLARK HALLS, PAISLEY.—CHALAIS, WEST FRONT.—LE CHATEAU DE PIERREFONDS AND DETAILS FROM ST. DENIS, BY THE LATE VIOLLET-LE-DUC.—THE MARKET HALL, MECHLIN.—INTERIOR OF GREAT HALL, GLASGOW UNIVERSITY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

MOSAIC WORK IN CHANCEL, CORK CATHEDRAL.

We regret that we have been unable to give an illustration of the pavement itself of the chancel at Cork Cathedral before the mosaics illustrated this week. The weather, and other causes beyond our control, have prevented the completion of the other drawing, which will, with the permission of Mr. Burges, be given shortly. The artist of the designs now given was Mr. H. W. Lonsdale; and the mosaics were executed by Messrs. W. H. Burke and Co., of Newman-street, Oxford-street, for the architect of the cathedral, Mr. W. Burges.

CHURCH OF ST. MARY, WOOLWICH.

The church which we illustrate to-day is about to be erected on the site of the present inconvenient and ugly building which does duty as the important Parish Church of St. Mary, Woolwich. Our readers are already aware that a recent limited competition resulted in the selection of Mr. James Brooks's design, and we have much pleasure in giving three double-page plates in illustrating so remarkable a work, which to our minds is equal to any of the notable designs which have been built by Mr. Brooks, and from time to time illustrated by him in our pages. It is to be hoped that every effort will be made to carry out the plan in its complete character, an event which would result in securing to Woolwich certainly one of the finest modern parish churches which we have recently seen. Our pages include a general interior, looking east, a ground-plan with views from the west and south-east. Our illustrations are reproduced from the competition drawings. The instructions received by Mr. Brooks stated that the drawings are to be "drawn to an eligible scale," and a 3-16th scale was adopted, it being the scale Mr. Brooks usually uses in making his contract drawings. The present church being of a most substantial character, the walls and foundations below the gound-line will be used in the new church, and the old materials will be built in the filling-in of the nave and other walls. By using the foundations and old materials a considerable saving will be effected. The accommodation provided consists of 1,005 adults and 68 children, making a total of 1,073. Two towers and spires are shown at the west end: one as a parish tower and one as a memorial to those who perished in the *Princess Alice* accident.

NORTH LONDON CONSUMPTIVE HOSPITAL, MOUNT VERNON, HAMPSTEAD.

The design which we illustrate by giving the entrance-front, the garden-front, and two key-plans, was selected in open competition some time ago; but the committee have only very recently felt justified in entering into a contract for the erection of a section (rather more than one-third) of the whole. The building is calculated for 100 patients, male and female. It will have three principal stories, in addition to an attic on the roof and a basement. The basement is appropriated to the out-patients' department, and to stores, and for administrative purposes. On the ground-floor are placed the board-room, the rooms for medical and household offices, patients' day-rooms, visiting-rooms, &c. The first-floor is appropriated to female patients, and the second floor to male patients. They are alike in their arrangements, and each contains a dining-room and a series of wards of moderate dimensions, calculated to receive from two to eight patients with all the requisite conveniences. In the attic floors are placed the kitchens, &c., and the apartments of the domestic servants and attendants. A lift will give access to all the floors, in addition to which a spacious central staircase and a service staircase are provided. A special feature of the design consists in the arcaded balconies, of which there are eight on the south or sunny side of the building. In these, patients will be able to enjoy the fresh air and views and sunshine, without fatigue. The style, as the illustrations show, is Early French Renaissance. The materials being employed are red brick, with stone dressings and tiled roofs. The contractors for the portion now in hand are Messrs. Higgs and Hill, of Lambeth, and the architect is Mr. T. Roger Smith, F.R.I.B.A.

THE GEO. A. CLARK HALLS, PAISLEY.

We give this week a view of the minor hall and river front of the above building. The memorial stone of the building was laid on the 22nd of October last by Mrs. Clark, of Gateside, the mother of the originator of the undertaking, and of the Messrs. Clark, of the Anchor Mills, Paisley, who are contributing largely towards the carrying out of their brother's intentions. The sum of £20,000 having been bequeathed by the late Mr. Geo. A. Clark for the erection of a public hall, reading-room, &c., for the benefit of his native town, steps were taken accordingly, and designs for the building were obtained through the medium of competition. The requirements set forth in the instructions to architects being found to be considerably beyond what could be provided for the above sum, the Messrs. Clark, rather than curtail the extent of the building which they thought were necessary, have generously supplemented the amount bequeathed by their brother. The cost of the site was £10,000, and the expenditure on the building itself will reach to about £50,000. In addition to this Mrs. Clark has signified her intention of presenting an organ for the large central hall, and a capital sum with which to endow it. Mr. W. H. Lynn, R.H.A., of Belfast, is the architect. In a previous number we gave a view of the two principal fronts, and a general description of the building. The work has now been carried as high as the level of the first string-course.

CHALAIS—WEST FRONT.

Our illustration is taken from a drawing prepared by Mr. R. Phené Spiers for Mr. Sharpe's lectures on the churches of Charente, in 1876. This west front was the only interesting portion of the church, and derived additional interest in Mr. Sharpe's eyes from the fact that in the tympanum of the arch, on the left of the central doorway, was what he considered to be the tomb of the founder of the church. Traces of similar memorials were found afterwards at the churches of Aubeterre and Chateauneuf. The members of the excursion were somewhat disappointed with the church, especially as some of the principal capitals of the doorway appeared to be clumsy masks without any decoration. Mr. Sharpe's attention being drawn to these, it occurred to him that these capitals were not in stone but cement, and hammering on one of them he discovered, to his delight, the beautiful detail of the original carving underneath, which had probably been coated over in cement during the Revolution to preserve it. Hammers and chisels were sought for, and three at least of the excursion party set to work to knock off the cement and reveal the original carving. Fancy the indignation of the inhabitants of an English village, fancy the horror of the Preservation Society at the idea of a similar party of 27 French students coming over to England and setting to work to destroy past history by chiselling off the cement of the Revolutionists! There was no indignation or horror here at Chalais. On the contrary, Monsieur le Curé seemed to be much obliged to Mr. Sharpe for having brought to light other beauties in his church than those to which he was accustomed. We have much pleasure in noticing the facts that the plates for the memorial work to the late Mr. Edmund Sharpe, M.A., are now already on the stone, and that Mr. Penrose is occupied with the preparation of the letterpress. The book has been taken up with some spirit by the members of the Architectural Association, and it should secure a place on the bookshelves of every member of that society, both as a valuable volume of reference, and as a fitting memorial of Mr. Sharpe, who did so much for the Association.

PIERREFONDS AND ST. DENIS.

For description of these drawings by the late M. Viollet-le-Duc, see p. 779.

THE MARKET HALL, MECHLIN.

Mr. C. H. Rew has failed to send us any particulars of the subject of his drawing, which was this year exhibited at the Exhibition of the Royal Academy, and which we publish to-day, illustrating the quaint old Market Hall and surrounding buildings in the great Square of Mechlin, or, as it is more generally called, Malines.

THE GREAT HALL, GLASGOW UNIVERSITY BUILDINGS.

One of our double-page plates illustrates the interior of the Great Hall of the Glasgow University, of which the late Sir Geo. Gilbert Scott, R.A., was the architect. The view shows the original idea of seating, but in execution this has been modified, and so has the groining on the right-hand side of the picture, a light arcade with detached shafts being introduced in a line with the front of the gallery. The windows remain as here shown. We have received no further particulars, but as we shall illustrate the exterior of this building in a week or two, with a plan of the entire University, we hope then to be able to give some account of the structure, and of those who have built it.

CHIPS.

Messrs. Scrivener and Co. are erecting the largest laundry in the world, for the London and Provincial Steam Laundry Company. The buildings are situated in the Battersea-park-road, and are being carried out from the designs and under the superintendence of Mr. Ernest Turner, of Regent-street, architect. It is intended to fit the buildings with the most perfect machinery, with all the latest improvements, and to light them by means of the electric light.

Messrs. Pierpoint and Son, of Warrington, have been appointed architects for the new schools about to be erected by the Warrington School Board.

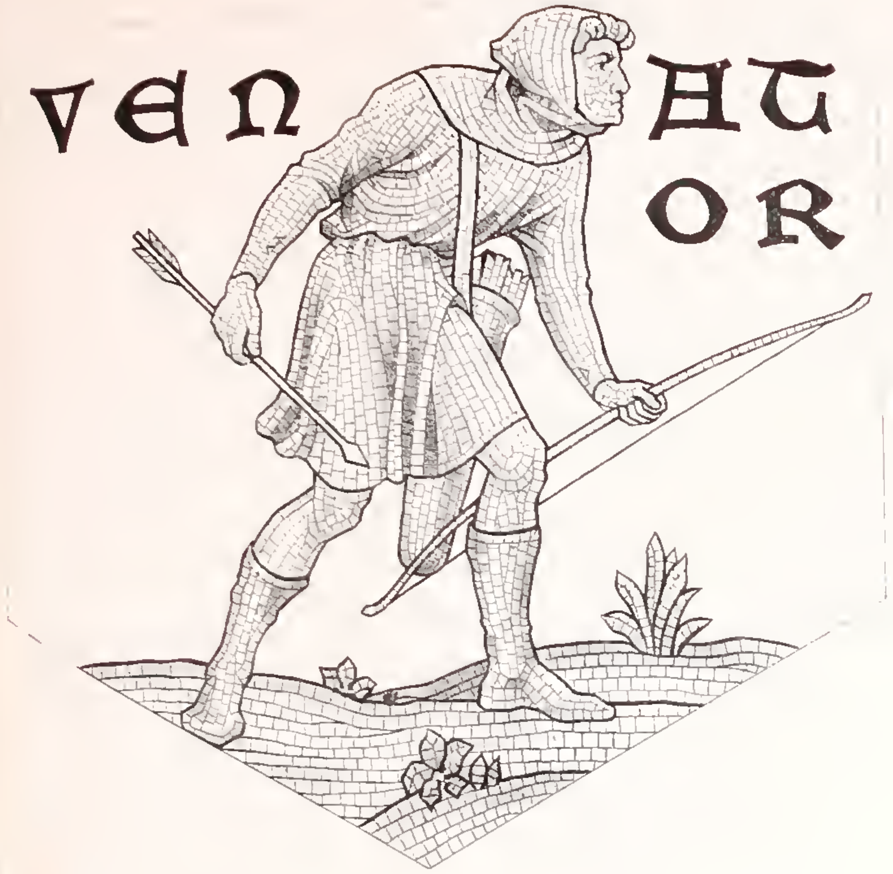
A handsome carved oak reredos, with hand-painted tiles, has just been presented to the parish church, Brecon. It was executed by Messrs. Jones and Willis, of Birmingham and London.

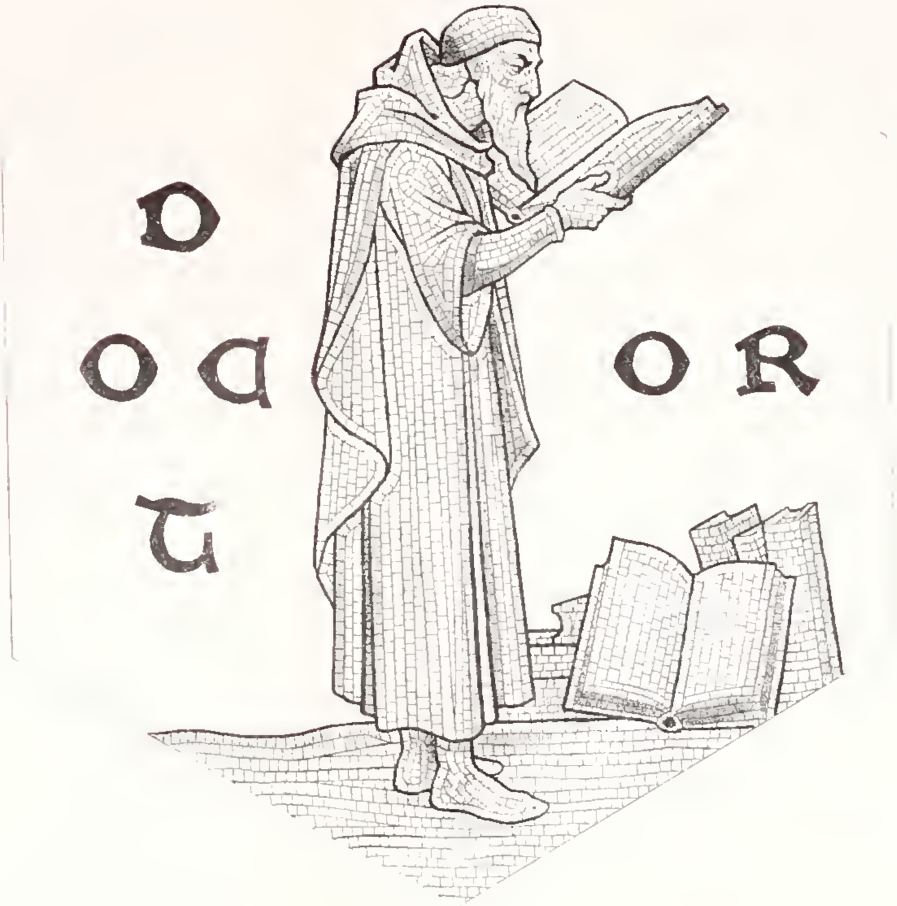
The parish church of Shapwick, near Blandford, was reopened on Sunday week after partial restoration, effected at a cost of £1,500.

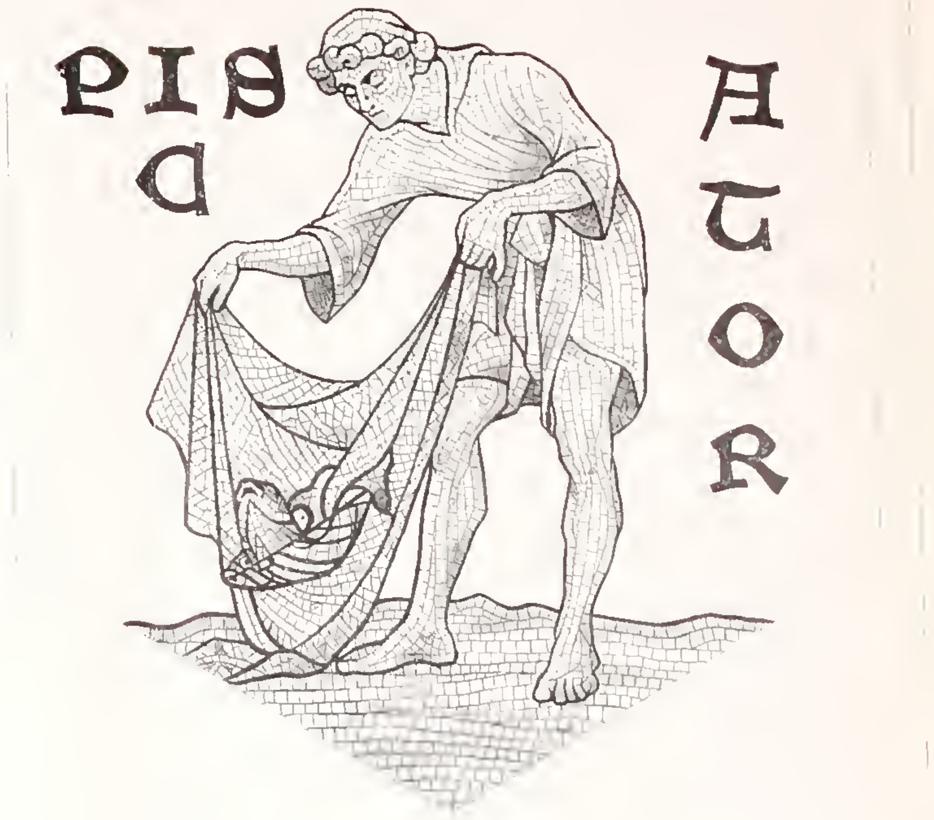
The London, Tilbury, and Southend Railway Company are promoting a scheme for the erection of a marine palace on a freehold site near the sea, 17 acres in extent, at Southend. The capital of the new company is £70,000, in £5 shares. The works are to be commenced at once, and a part of the premises are expected to be opened on Whit-Monday next.

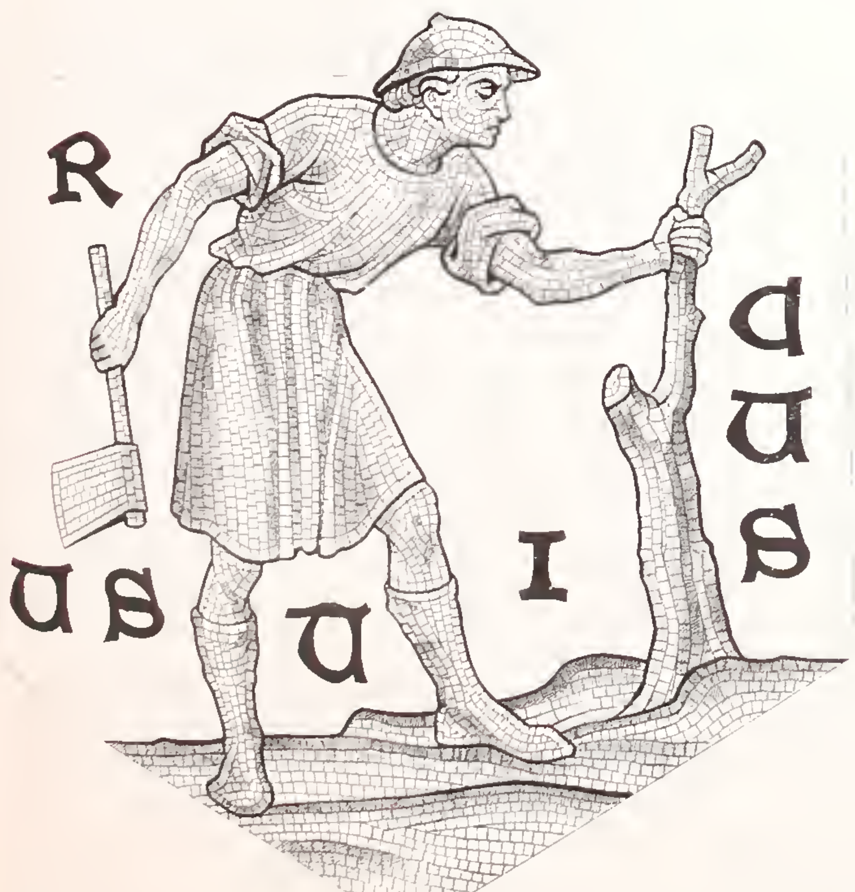
The foundation-stone of a new district church was recently laid in Alumhurst-road, Bournemouth. The scheme provides for the erection of a cruciform church, seating 600 persons. At present only the chancel is being built, at a cost of about £900. The materials are bricks with stone dressings, and the style is Early Pointed; 150 sittings will be provided. The architects are Messrs. Adams and Horner, and the contractor is Mr. Richard Pike.

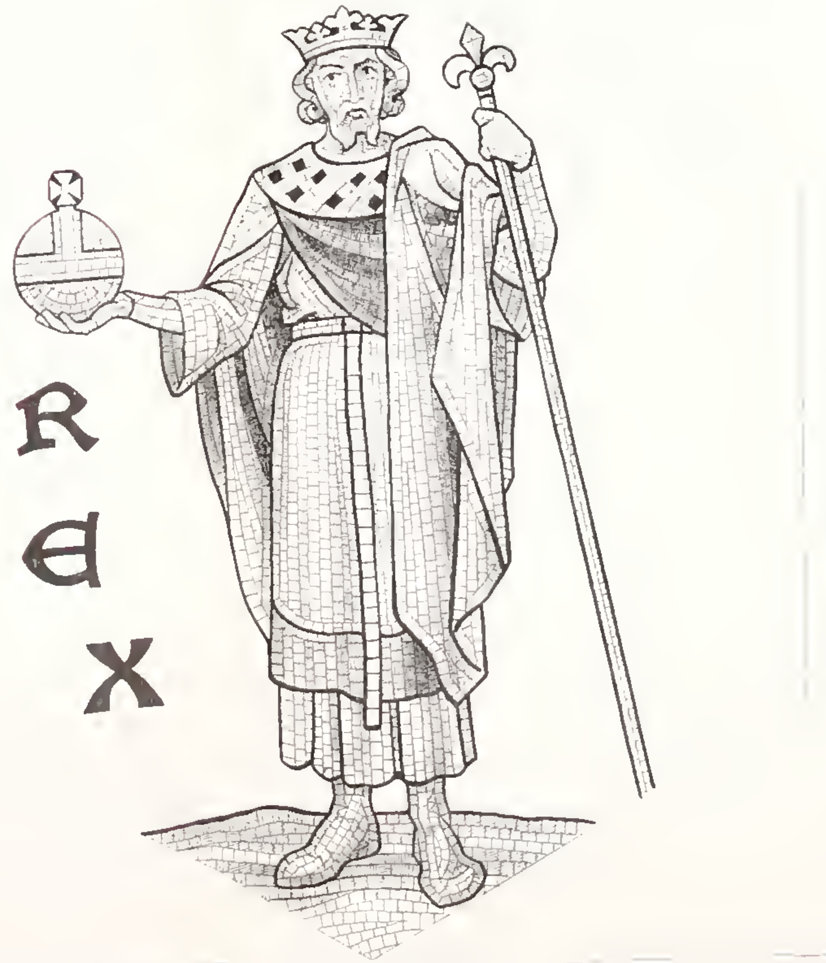
Mr. James Osborne, of Carlisle, has been appointed inspector of nuisances by the Scarborough town council, at a salary of £110 a year.











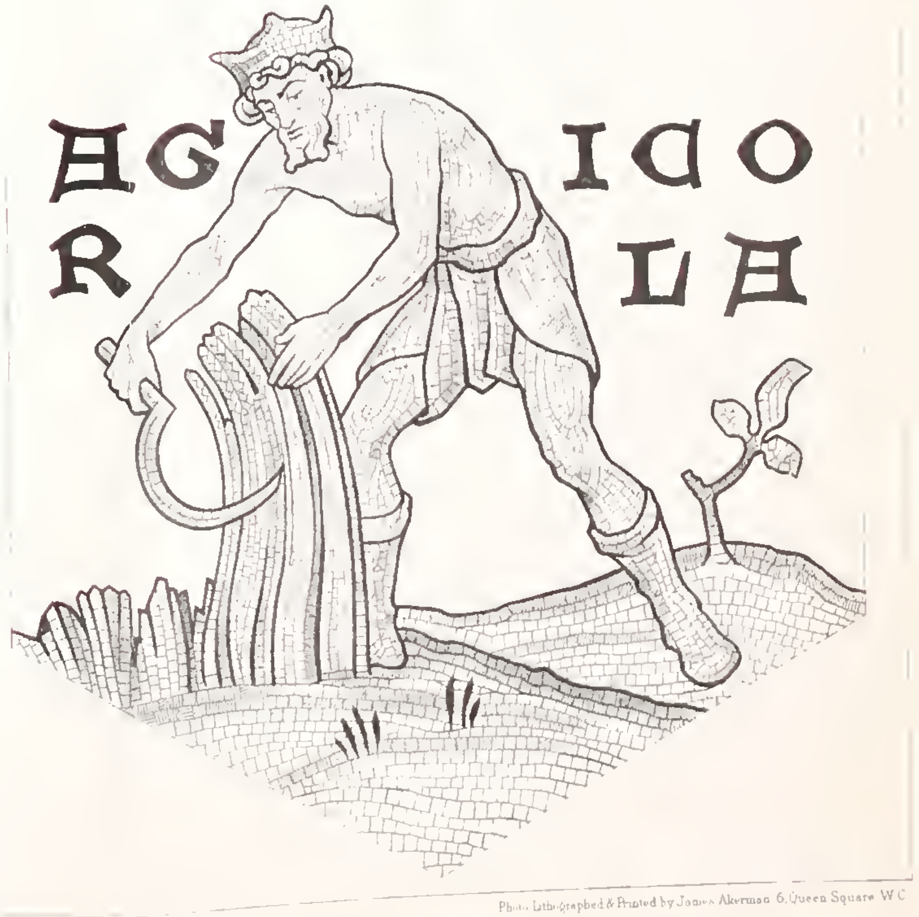


Photo-Lithographed & Printed by James Akerman 6, Queen Square W.C.

Maurice B. Adams Del. From the working cartoons

Mosaic Pavement of Chancel Cork Cathedral.
The six principal figure subjects.
W. Burges Architect.

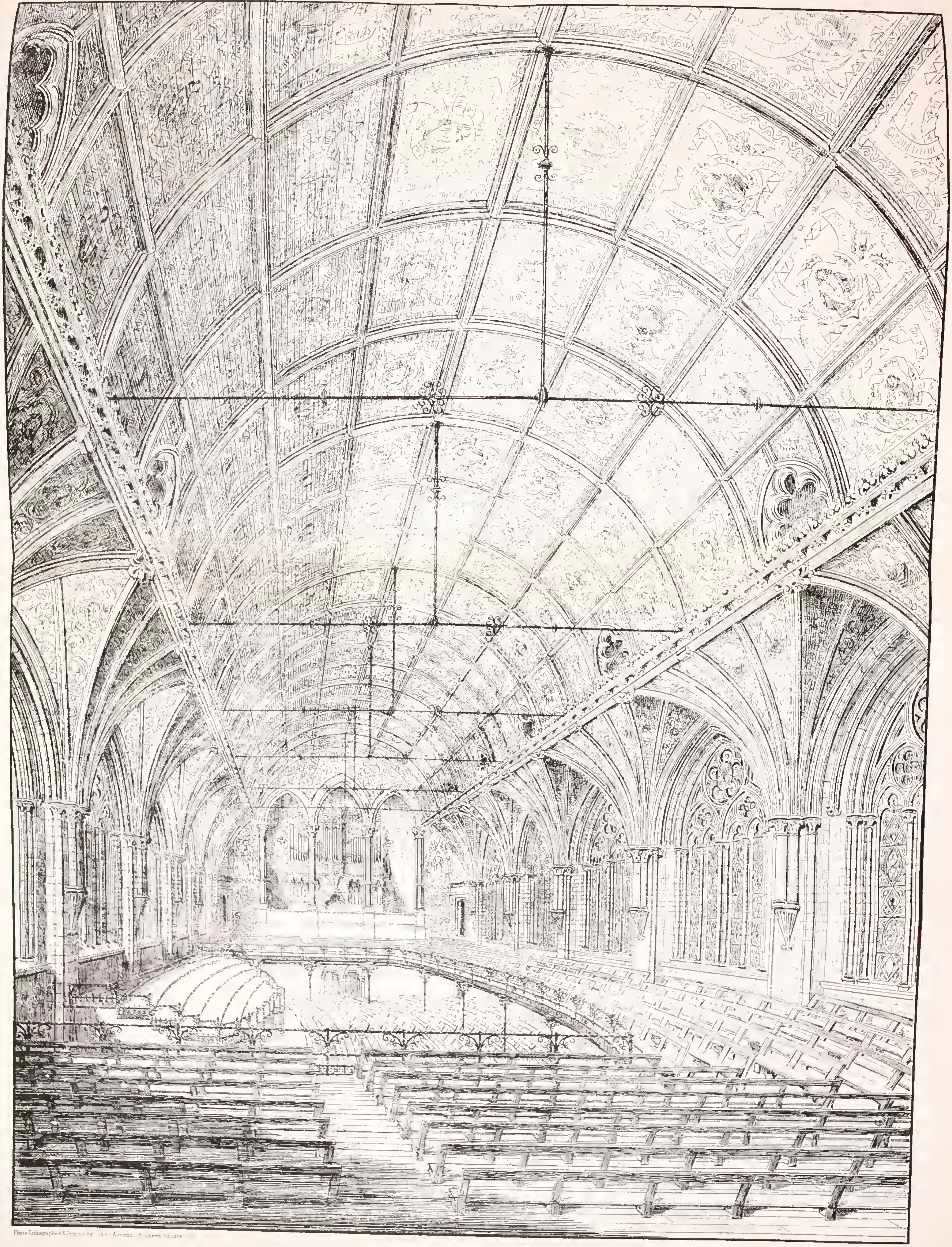
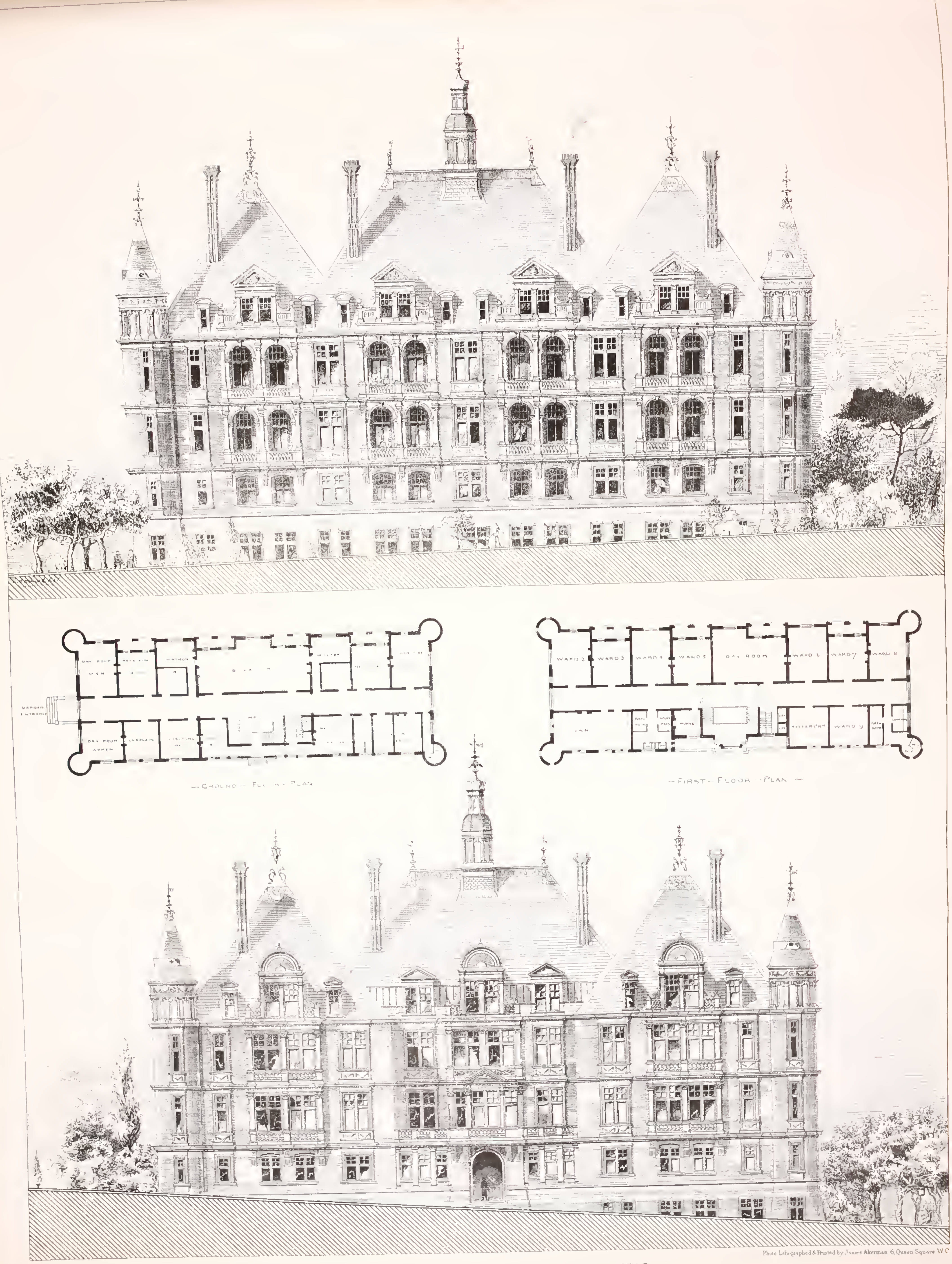


Photo-Lithographed & Printed by James Akerman, 6, Queen Square

GLASGOW UNIVERSITY BUILDINGS
INTERIOR VIEW OF GREAT HALL.

Sir Gilbert Scott R.A.
Architect
31 Spring Gardens
London



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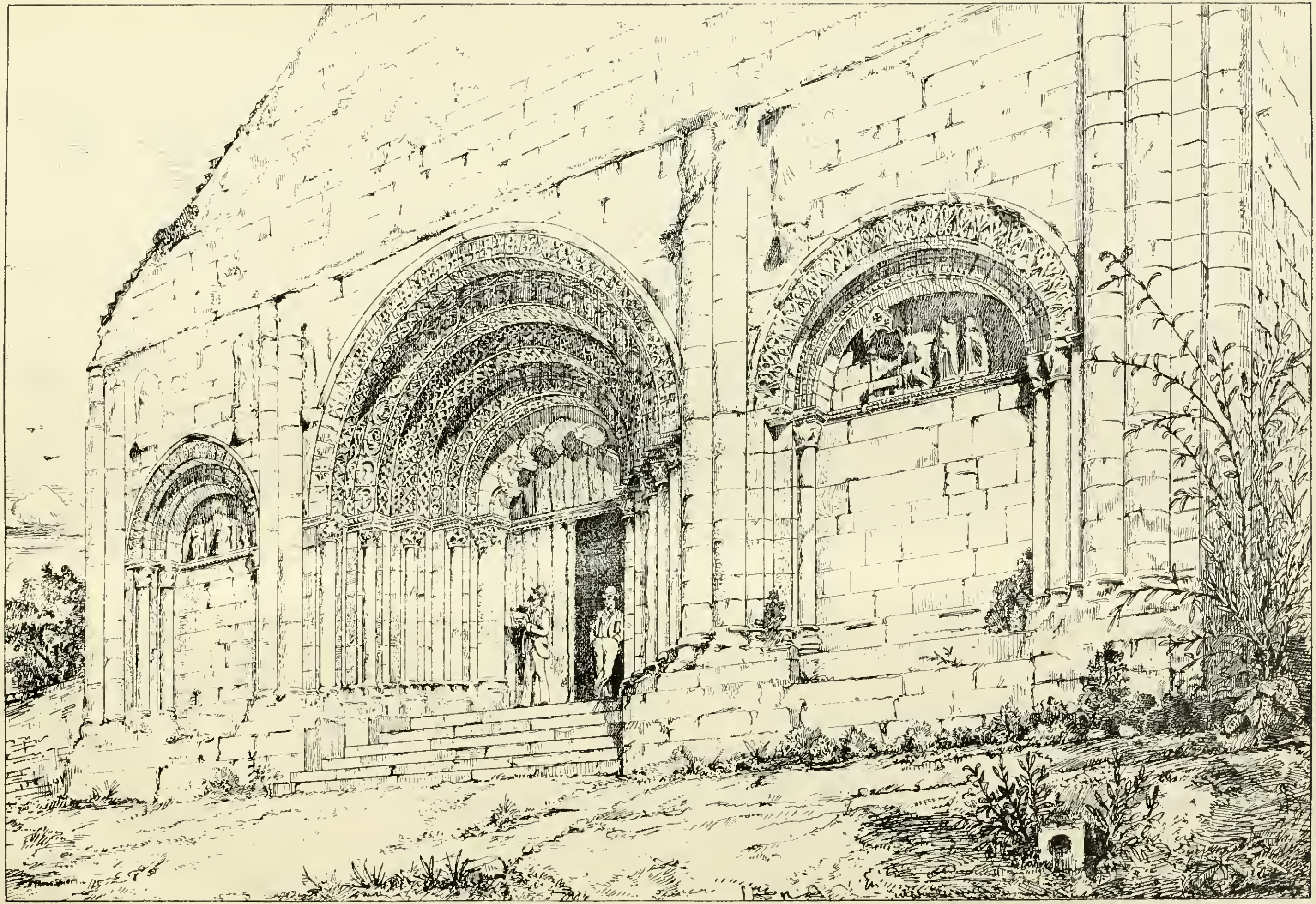
NORTH LONDON CONSUMPTIVE HOSPITAL HAMPSTEAD

Mr T. Roger Smith Architect



Drawn by R. Phene Spiers F.R.I.B.A.

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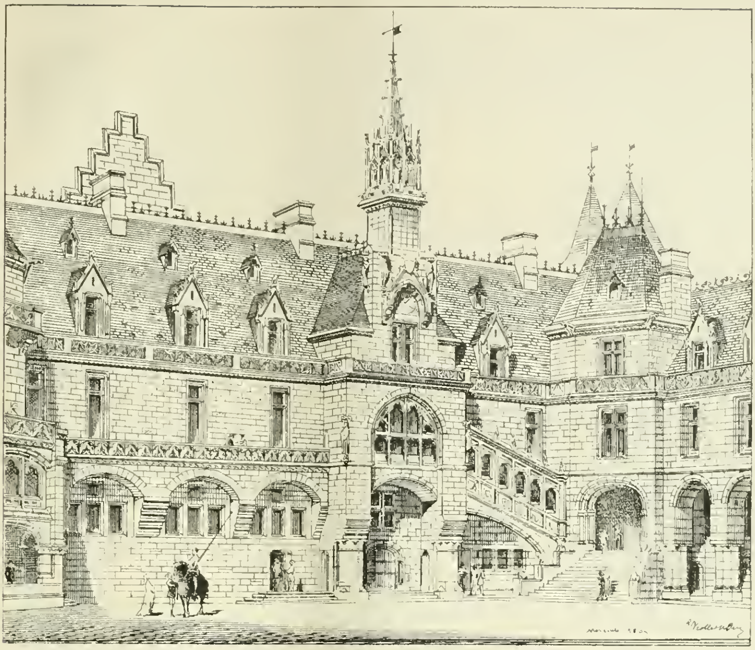
CHALAIS. WEST FRONT.



LE CHATEAU
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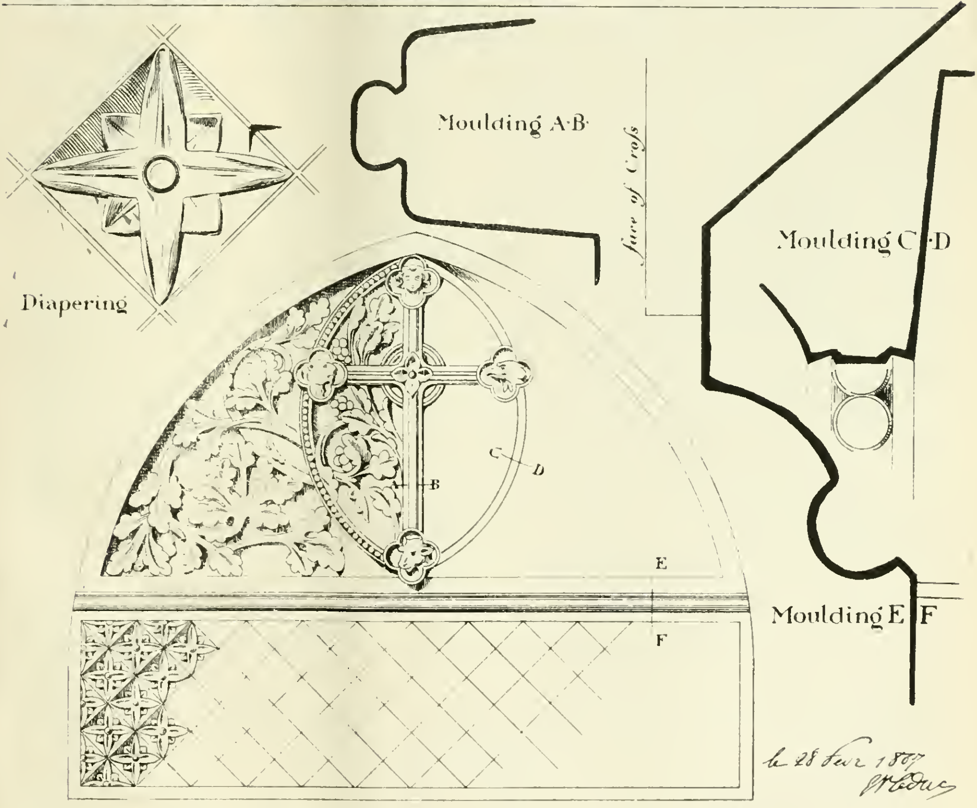

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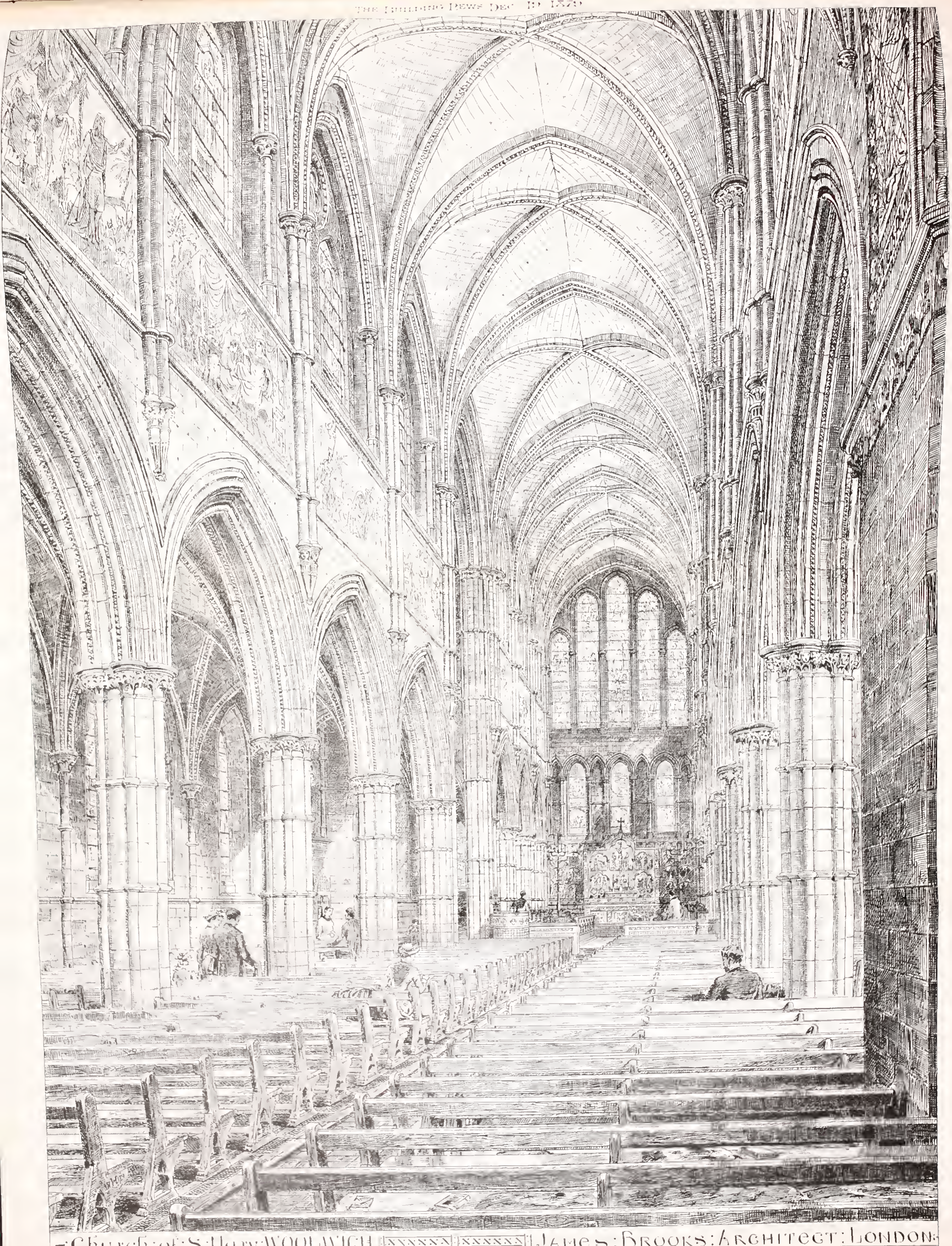
MAURICE B. ADAMS DEL.
Photo-lithographed & Printed by James Akerman, 6 Queen Square, W.



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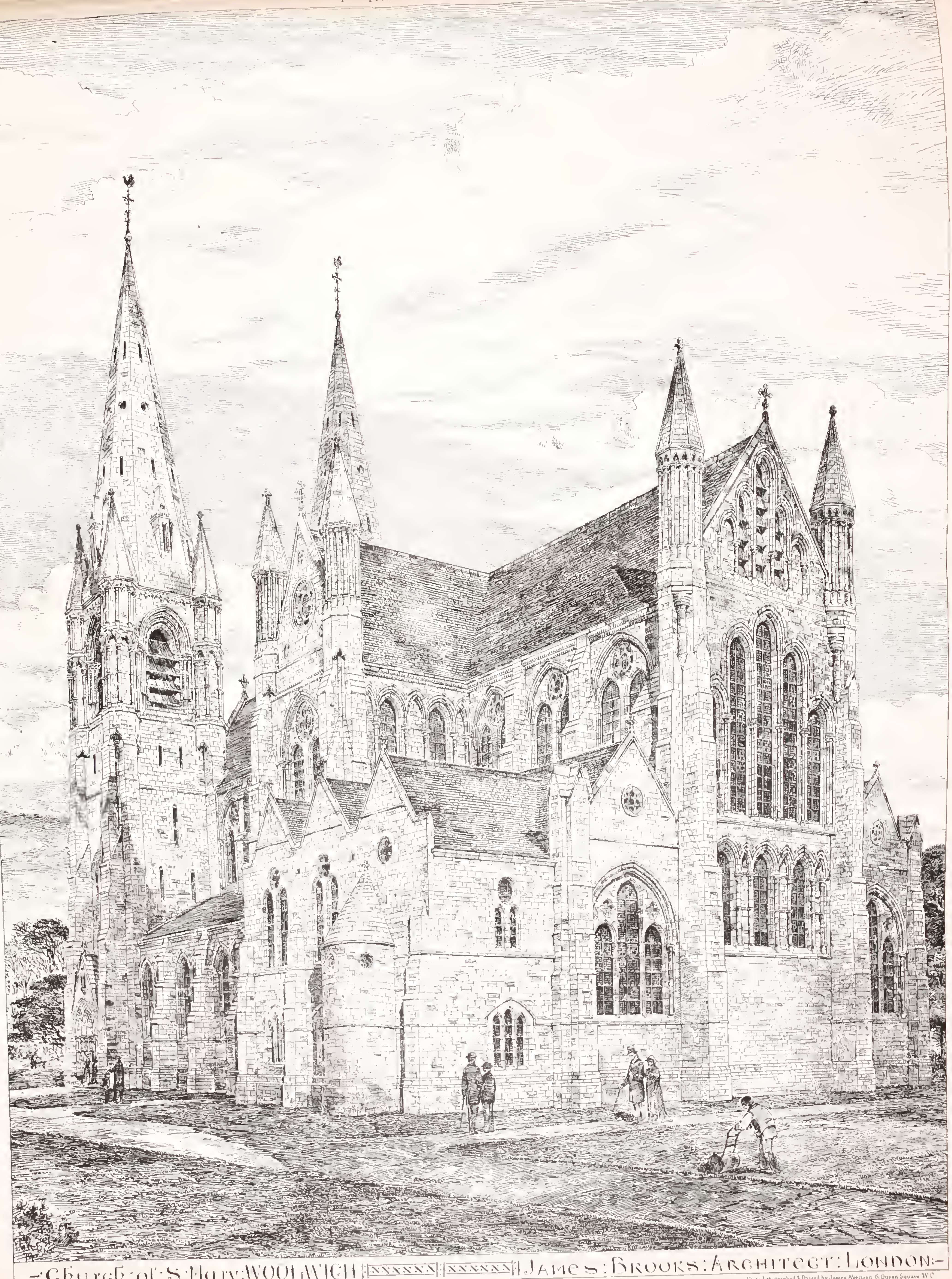

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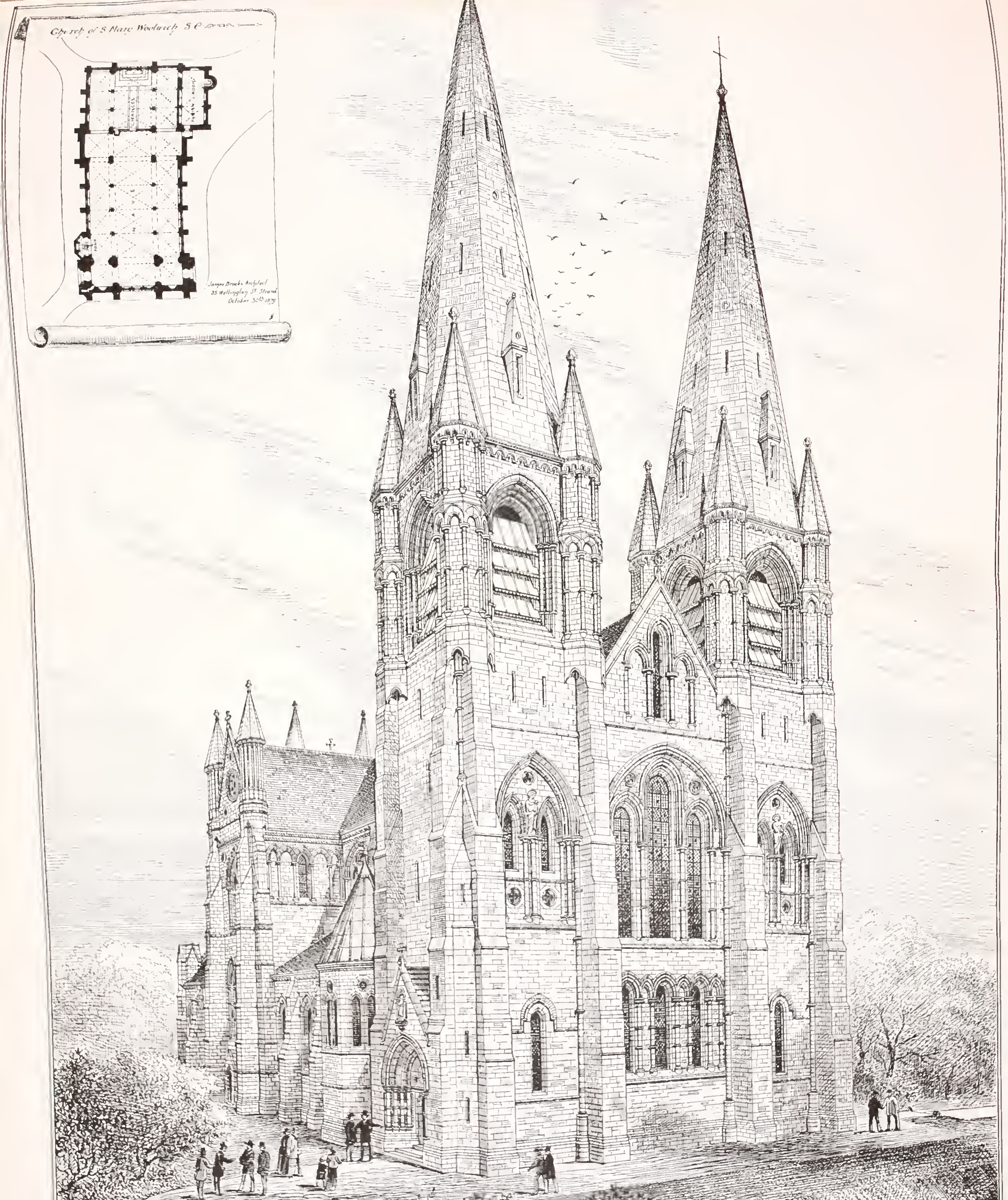

Church · of · S · Mary · Woolwich · View · of · the · West · Front · ✠ · James Brooks · Archt. · LONDON ·

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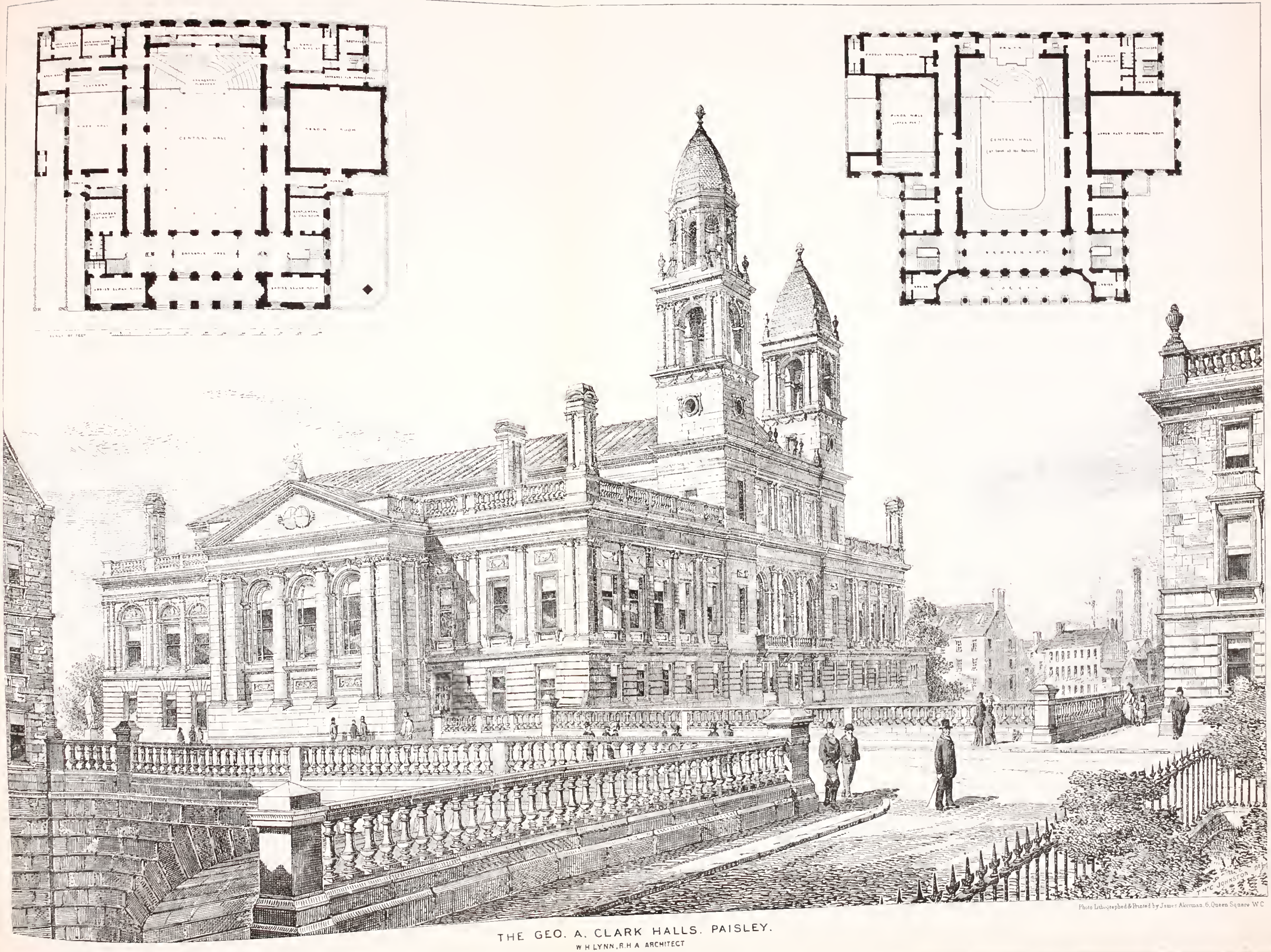

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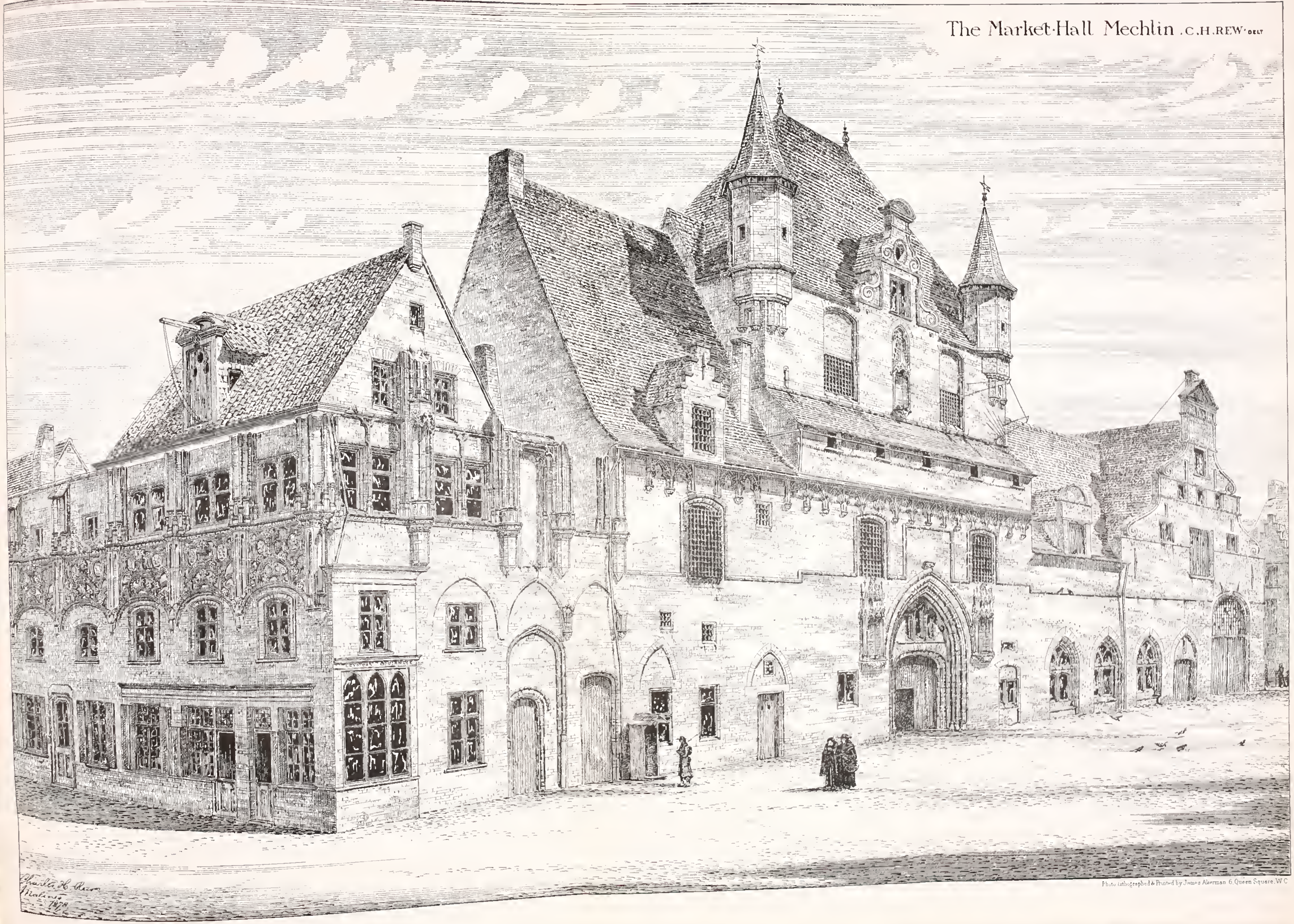
THE GEO. A. CLARK HALLS. PAISLEY.

W. H. LYNN, R.H.A. ARCHITECT

The Market-Hall Mechlin. C. H. REW. DELT



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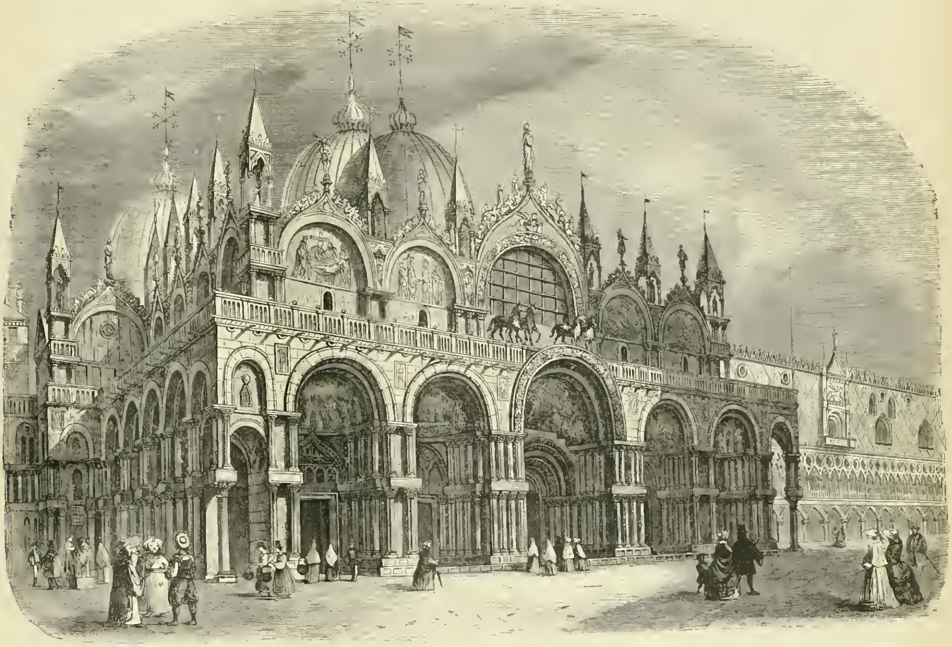
ST. MARK'S, VENICE.

In his "Stones of Venice" Mr. Ruskin devotes a long and glowing chapter to an analysis of the charms of this well-known church, which has suddenly become the aim and butt of all the Anti-Restorationists, the subject of protest and invective, of deprecation, entreaty, apology, and indignation. Into the controversy as to the intended restoration of the gold mosaics we do not propose here to enter—it is now admitted that the west front of the building is in some danger from the sinking of the foundations into a subsoil at all times treacherous, and a commission is inquiring for the Italian Government into the proposed repairs—but simply to note the salient features of a building rich in historical associations, and invested at the present moment with unusual interest.



WEST FAÇADE OF ST. MARK'S, VENICE.

And first as to the church itself—the cathedral, as it has been entitled for the last three generations. Earlier basilicas had stood on the site, but the existing church dates in foundation from 977, when it was commenced from the designs of a Greek artist immediately after the destruction of the previous building by fire during a riot. It was completed in all essentials within a century of that time; but, owing to the non-perfecting of the internal decorations, consecration was not performed till 1085, or, according to other authorities, 1094. The plan* is of the Eastern basilican type, and consists of five domes arranged as a Latin cross (Gwilt erroneously speaks of it as a Greek cross). The arms are vaulted hemi-cylindrically, forming the lesser domes, and terminate in four semicircular arches, set as the sides of a square. Pendentives gather over to support a central drum, from which the principal dome springs as a hemisphere, and wherein are window openings lighting the interior of the building. The central dome and that over the western limb of cross are 42ft. in internal diameter, the other three measure 33ft. across. An aisle or portico surrounds the three external sides of the nave, and appears to be a continuation of the original building. Under the eastern part of the church is a crypt, 86ft. by 74ft., and less than 9ft. in height. Externally the church measures 260ft. from east to west, and 215ft. across transepts, the internal dimensions being 205ft. by 164ft., and the church is surpassed in size by two others in Venice—San Paolo and Sta. Maria dei Frari.

The western façade, looking out on the great square of St. Mark, as will be seen from our illustration, reproduced by permission of Messrs. Chapman and Hall from Mr. Fergusson's "History of Architecture," Vol. II., consists of two stories; the lower one is divided by coupled columns of two orders into five large porches, covered in by semi-circular arches. Above these runs a balustrade, forming the front of a gallery, and continued along the return faces of nave. On either side of the chief entrance are grouped in pairs the celebrated bronze horses—Byron's "steeds of brass"—originally taken from the arch of Nero, at Rome—at once a trophy of the conquest of Byzantium and a memento of the capture of Venice by Napoleon. Set back from this front is a second story, similarly interspaced into five arched recesses. On either side of the central opening are two blank arches, the tympana of which are filled with mosaics, of which more presently. At a comparatively late date the circular heads of these arches have been capped with ogee canopies with exuberant flowing foliated crocketings. These, and the gigantic statues, the pinnacled turrets, and the swelling outlines of the many domes behind, assist in breaking up a composition which, after all, depends chiefly for its effect upon the delicate plays of colour on the inlaid marbles, on the valuable stones, and on the gold mosaics with which every flat surface on the front is relieved.

The subjects of the mosaics filling the five great tympana, just now the subject of so much controversy, are as follows:—Beginning on the left or S.W. angle is the most ancient, representing the Church of St. Mark as it is known to have appeared after 1205; from its archaic appearance it is believed to have been executed soon after that date. The next shows the Venetian Magistrates venerating the body of St. Mark, and was designed by Sebastian Rizzi in 1728. The central one is so recent as 1836, and depicts the Last Judgment; it was executed from the designs of Querena by Liborio Salandri. The fourth and fifth show the removal of St. Mark's body from the tomb at Alexandria, and were designed by P. Vecchio in 1650. In the spandrels above are four mosaics, dating from 1590, and executed from the designs of the son of Tintoretto. The subjects are: "The Taking Down from the Cross," "The Descent into Hades," "The Resurrection," and "The Ascension." Only one, therefore, of these mosaics is earlier than the Renaissance. At the rear and on the north the church abuts on and is built into by the Doge's Palace, while, quite detached, in the square opposite the north end of the west front, is the symmetrical fluted square shaft of the Campanile, rising 320ft. above the Piazza paving to the Angel weathervane.

As Mr. Fergusson remarks, St. Mark's is by no means a large church, nor is the arrangement of plan or the disposition of parts equal to those of Northern architects, if looked at from a purely architectural view; the screens of pillars which divide nave from aisles are unmeaning, the projection of transepts is too great for the length, and the whole wants unity. For all that, he finds it impossible to find fault with plain surfaces when covered with such exquisite gold mosaics, or with the want of accentuation in the roof when every part is more richly adorned in this manner than any other church of the Western World; indeed, even after this severe criticism of details, he pronounces the richly-furnished choir to be "perhaps the most impressive interior in Western Europe." Mr. Ruskin, with his accustomed vigour and quickness of perception, indicates in his "Stones of Venice" that the first broad peculiarity of the building, and the root, indeed, of every other important peculiarity, is its confessed incrustation, and declares St. Mark to be "the purest example in Italy of the great school of architecture in which the ruling principle is the incrustation of brick with more precious materials." Here, and in the chapter treating upon Truth in the "Seven Lamps," the great art critic defends veneering as an admitted duplicity which can deceive none but the ignorant, and declares it to be no more insincere than is the wearing of a coat of steel mail by a knight, whom all civilised people recognise as a man and not a steel figure. Upon the laws and customs of this architectural chivalry of St. Mark he dwells lovingly, urging that they formed the necessary outcome of the importation of all the nobler building materials into a shallow lagoon in vessels of very small capacity. As for the mosaic pictures within and without the building, they originally formed the vaulted leaves of a stone manuscript, which the writers knew every one would be glad to decipher, and in the possession of which they would rejoice. He describes these mosaics in detail, and shows that in the portico on either side of the nave, which are reserved for unbaptised persons and new converts, are shown the great facts of Old Testament history, from the Fall of Man to the Fall of Manna. On entering the church there is seen, on looking back, a mosaic of Christ enthroned, holding a book, with the Virgin on one side and St. Mark on the other in attitudes of adoration. The mosaic of the first or western dome represents the Effusion of the Holy Spirit as the first consequence and seal of entrance into the Church of God. On the vaulting beyond are inlaid the Crucifixion and Resurrection of Christ, with the usual intermediate scenes; and the second, the great central cupola itself is entirely occupied by the subject of the Ascension. The eastern cupola, that over the altar, represents the Witness of the Old Testament to Christ; and in the lateral chapels and cupolas are the whole series of New Testament history, the events of the life of Christ, the Apostolic miracles, and the Revelation, in which latter, says Ruskin, "the old mosaics have perished, and have been replaced by miserable work of the 17th century." In a few graphic touches of the pencil, Mr. Ruskin summarises the features which give to the interior of St. Mark's its peculiar effect: "Darkness and mystery; confused recesses of building; artificial light employed in small quantity, but maintained with a constancy which seems to give it a kind of sacredness; preciousness of material, easily comprehended by the vulgar eye; close air loaded with a sweet and peculiar odour, associated only with religious services; solemn music, and tangible idols or images having popular legends attached to them—these, the stage properties of superstition . . . . are assembled in St. Mark's to a degree, so far as I know, unexampled in any other European church." E. W. P.

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* A woodcut of the plan appeared in the Building News for April 4, 1873, as one of the illustrations of Sir Gilbert Scott's Academy lectures on "Domes."

THE CATHEDRALS OF MAYENCE, WORMS, AND SPIRES.*

ASCENDING the Rhine from Cologne, one finds a counter-current of architecture which widens as the river banks narrow, until the accumulated power of the style expands and culminates in the three great Rhenish cathedrals of Mayence, Worms, and Spires. On leaving Cologne the flat banks of the Rhine are without interest until the towers of the Cathedral of Bonn are seen. This is a fine old building of the 11th and 13th centuries. At the junction of the Gothic nave with the fine polygonal-ended Romanesque transepts rises an octagonal tower, surmounted by an immense wooden steeple. The choir is exceptionally deep, and its circular apse is flanked by large square towers. The interior has nothing of special interest except that here again the fine effect of raising the altar high in the apse is noticeable.

From this point the banks of the river begin to justify their romantic reputation. Ivied walls and terraced gardens recall the Lake of Como; but it is curious to mark the influence of the English, who for many years have frequented this part of the Rhine, in the cottages and villas, many of which have an unmistakable English trimness. Then comes Coblentz, upon whose costly stone forts the modern engineer may look with a smile across to the distant heights whose simple and formidable earthworks may replace them. From here the river winds between the hills, vine-clad or wooded, and crowned with ruined towers. We have no time for these romantic donjons and turrets, for we should push on and give all the time we can to Mayence, an important objective-point for the architect.

Mayence, with a population of 36,000, lies on the left side of the Rhine, here crossed by a long carriage bridge, upon iron pontoons; these, by the bye, have rudders, and can be serviceable boats in time of inundation or war. Modern streets have somewhat cut up the town, but it still retains the comfortable quaintness of its olden time, which is a fitting frame for the magnificent cathedral. This huge pile at first sight seems of brick, so bright a red is its tint; but it has a rosy softness which belongs only to stone. On approaching it the stranger will probably be fairly puzzled. Coming up from the river he sees before him a semicircular apse terminating the nave at its junction with transepts, buttressed by slender round towers. Over the crossing rises a fine octagonal lantern, with lofty, steep-pitched roof. This has just been rebuilt,—I do not say restored, because it replaces a high Gothic lantern, with domical roof, which it may be supposed was going to ruin; this only would justify so great a change, although the new octagon is fine and well in keeping with the simple Romanesque apse. This being the apse or rear of the building, the visitor pushes on to see its front, and threading his way through the buildings which encumber the sides of the church, emerges, to his surprise, under a much larger transept, and sees a magnificent choir, with triple apses and towers, and over the crossing a great lantern tower. For a moment he may believe he has come upon another church; but a glimpse of the nave and the first lantern explains the disposition of this huge "double-ender." This disposition of a lantern and choir at each end is a characteristic of the great Rhenish churches, and though theoretically it would seem to divide the interest and injure the unity of the design, where, as in this case, the choir and lantern greatly predominate in mass and richness, no confusion can exist, and the composition groups finely about the great lantern tower. Thus did the Germans develop the Roman basilica from the Ravenna type into a great Christian and commemorative monument, for the smaller choir was intended as a tomb chapel, with a crypt below; and could anything be grander that a tomb thus placed, looking down the long nave to the greater choir beyond! The principal choir dates from the beginning of the thirteenth century, and shows something of the angular Gothic influence; for the bold semicircular apses of the earlier style are substituted ones of three sides of an octagon, the only important example in Germany of a triapsidal polygonal arrangement. These apses have on each face under the corbel-table an arcade of three double bays, and beneath this a range of engaged *colonettes.* Below, in striking opposition, is a single round-arched window in the thick wall, which is further strengthened at the angles by solid buttresses. The apses, with their slender flanking towers, form one of the most beautiful compositions I have ever seen. The transepts are simpler, but elegant, with a rich series of orders and archivolts filling the jambs of the windows, and it certainly forms a very happy transition between the more florid choir and the stern simplicity of the nave. The transitions from the earliest end, whose varied silhouette of lantern, apse, and flanking towers forms an imposing façade, without ornament, to the almost unbroken wall of the severe nave, then to the more elegant transept, and at last to the sumptuous choir, with its rich, arcaded apses, are striking, and the crescendo is superb. Successive generations, each in its own style, unconsciously worked to a most perfect artistic conclusion, and teach us, in our own more homogeneous designs, to adjust our means, be they ever so simple, so that an imposing front, a solemn nave, and richer transepts will give to any ornamentation concentrated upon the choir an extraordinary value. The great central tower which binds the whole composition together does so by its imposing mass, for its architecture is incongrous. Upon two Romanesque stories is placed a higher Gothic one, above this are two more stories in deep retreat, and the whole crowned by a florid Renaissance stone roof and finial. The small towers flanking the choir are capped with Renaissance domes, also, which give to these parts a certain rococo look. The chief defect in the design is the want of portals, which, as in many Rhenish churches, were never properly provided or emphasised. This lack of portals, or porches, is the more remarkable in that these features are one of the finest characteristics of the Romanesque in other countries. The actual entrance is in a corner of the transept, and much of the true effect of the interior is at first missed on entering; but such fine proportions cannot fail to be appreciated from any point of view. The nave is magnificent. A bold vault, with a touch of the Gothic influence, spans it, and includes between the round pilasters of each bay of vaulting two of the square piers and arches of the aisles. The lines of the aisle arches are carried up on the nave wall, and inclosed by a second shallow arch, and within these spaces are painted figure compositions. The richly-stained, ruddy stone walls are reduced to a soft, warm tint by the vigorous reds and yellows of the archivolts and string-courses; but these are only narrow lines of colour which lead the eye down to the transepts and choir, whose vaults, as well as the interior of the lantern, have lately been splendidly coloured. The surfaces generally have greenish tints in patterns. The great pendentives of the octagon have a stony blue ground; the constructive lines generally red, varied with yellow. The decoration, in scheme and detail, is very fine, perhaps the most successful effort recently made to decorate a great building. The name of Herr Laske was given me as that of the architect who has had charge of the works on the cathedral; but I could find out little about him. Whoever designed this decoration must be a man of first-class ability. Against the piers of the nave is a wonderfully complete series of tomb monuments to archbishops of Mayence. They date from the simple black marble slabs of the eleventh century down through the various styles which culminated in the most elaborate lace-like carving of the Gothic, while the chapels and transepts have an equally complete series of the Renaissance. The dimensions of the cathedral are variously given. The German authority, seeming to me the most probable, gives 174 yards long by 58 broad across the transepts. The aisles are simple and narrow compared with the nave, which is very spacious and lofty. Whatever may be the actual dimensions, the interior, from its proportions and simplicity, undoubtedly appears larger and more impressive than even its really great dimensions lead one to expect.

A short distance south of Mayence lies the ancient town of Worms, which was nearly destroyed in 1689; the great cathedral, however, escaped. Whereas Mayence Cathedral, begun in the 10th century, underwent modifications from the 12th to the 15th century, that of Worms, begun in 1110, was completed and remains in the original Romanesque style. It is smaller than the Mayence example, being 141 yards long, 29 wide, and measures 40 across the transepts. It is a basilica, with double apses and octagonal lanterns and transepts at one end; this, and the fact that at the same end the circular apse of the interior has a square outer wall, makes it difficult to recognise in the composition which is the principal choir. At either end are two handsome round towers, an octagon covers the transept crossing, and a smaller one rises between the two towers of the opposite end. Unfortunately the **larger** lantern is low, and no higher than the other, so the composition does not group well, as either end asserts itself with nearly equal importance; in this respect it is inferior to Mayence, though externally the nave is the finer of the two, with large windows in the clerestory and aisles. The details also are purer and better than those of Mayence. Its entrances are in the sides of the nave, a characteristic of the Rhenish architecture, even when double choirs do not occupy the two end façades.

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* By a Correspondent of *The American Architect and Building News.*

The third of the great Rhenish churches is at Spires. I have been rarely more impressed than I was by this noble building. As the train, after several hours of flat, monotonous scenery, stopped at the little station of Spires, I suddenly caught sight of the immense pile, above the trees, and I shall not soon forget that first glimpse of the arcaded apse, flanking square towers, great transepts, octagons, and immense nave, all surrounded with a beautiful arcade under the eaves. The effect of these vast walls, of a soft red tinge, towards sunset was overwhelming. The great church stands in a small park at the beginning of the single street of the little town, whose modest houses seem to be dwindling and shrinking away. The end towards the street has a magnificent porch or narthex the whole width of the nave and aisles. It was rebuilt by Hübsch in 1854-8, supplying amply the want of porches which exists in its two great rivals at Mayence and Worms. This vestibule, or Hall of the Emperors, as it is called, contains the statues of the eight emperors buried in the crypt, beginning with that of Conrad II., who founded the cathedral in 1030. The other dates of the building are undecided; but the building was finished before Gothic influence in any way weakened its majestic solidity, and Mr. Fergusson cites it as the finest example in Europe of a building conceived in a truly Doric spirit. The massive walls are perfectly plain throughout their width and height up to the dark shadows of the arcade beneath the roof. The great transepts are square, with huge buttresses at the angles. Solid square towers fill the angle between transepts and choir, and the great octagon is covered with a domical roof; these, with the circular apse, form a superb group. At the other end of the vast nave are similar square towers in the angles of the porch, which being the height nearly of the nave, and with the same projection as the aisles, appear from the sides like transepts. Over the central compartment of the vestibule is a second and smaller octagon. The façade of this end, as rebuilt by Hübsch, is of elegant design, but has been too much modelled upon the black and white architecture of the north of Italy, and is more pretty than this "Doric" style allows. The carving of capitals in this new porch is remarkably fine. So grand a vestibule is a severe trial for the nave, but the latter is equal to any test, and opens magnificently under its lofty round vaults. It looks as large as Mayence, although the same authority above quoted gives its length as 147 yards, width across the transepts 60, with a breadth of nave between the piers of 15. Its height is 105ft. It is probably the fine proportions of the nave, which is of extraordinary width and height, magnified by its bold simplicity, which gives such exceptional grandeur to this interior. The aisles are also admirably proportioned. In short, I know of no church whose simple proportions, without aid from optical tricks, are more grandly effective. The transepts project twice the width of the aisles, and are, as well as the short choir, raised 10 or 12ft. high above the nave. As the choir, with its apse, has little more depth than the transepts, they form together a splendid hall, reached by a flight of steps the whole width of the nave. Near the transepts, in the aisles, steps lead down to the crypt, whose size, extending beneath the transepts and choir, and colossal piers and vaults, render it the most imposing crypt I have ever seen. The interior was entirely decorated in 1845-54 by Schwarzmann, or under his direction, and Schrandolph painted the 32 principal figure compositions. To my mind it is an entire failure. The noble walls are enveloped in a cold gray tone, like a chilly mist, and the warm ruddy stone hidden beneath a coating of gray plaster. What a contrast with Mayence, where a few lines of strong colour upon the bare stone walls give the richest effect; whereas here the most elaborate decoration looks poor and cold. There is no system; and a complication of patterns, added to a want of strongly accentuating bands of colour, produces a weak, uncertain effect. The figure compositions are as timid in colour. The nave vaults are a pale blue, with brown ribs picked out with red, those of the aisles yellowish, with similar ribs; the prevailing tone of the walls is greenish gray, often with lilac and pinkish patterns. The dome of the large lantern, however, is fine; it has a solemn range of figures covering the lower half of the gilt vault, but its bold simplicity only brings out the weak elaboration of the other decorations. The sacristy has vaults of brick laid without cement, and the clean, dark joints produce a pretty effect. Although Heidelberg, but an hour or so from here by rail, is crowded by tourists, few ever think of coming to see this splendid building. Mayence, being a comfortable stopping-place on the Rhine, is better known, but few who visit this region ever visit or hear of Worms.

The Germans, incited by their glorious political achievements, now boldly lay claim to supremacy in all directions. The present fashion for mediævalism has tempted them to claim the invention of Gothic architecture—than which nothing can be more preposterous, in view of historical evidence and that of their buildings themselves, which betray a style applied by architects who, precisely because the initial development did not come from Germany, never fairly understood an architecture indigenous to France and England. The perverseness of this claim is the more striking in that they undervalue the noble architecture which, by their own native efforts, had already attained monumental qualities never yet surpassed, and which only needed time for the development of its great resources to give them a truly national style, perhaps unrivalled in any land. When we see how experiment after experiment was necessary for the perfect development of the Gothic, as for every mature style, the imagination is fired by the thought of what might have been attained with these Rhenish monuments as a *point de départ*—for these three great cathedrals were built, it should be remembered, about the same time, and after only a few experiments. The question for us is, whether a style of such solid grandeur, however capable of development in the Middle Ages, when time and labour were almost unchallenged factors in building, can find favour in a century of cheap and rapid construction. There is one consideration, however, which will certainly recommend it to our serious attention ere long. Our generation recognises the advantages of painted decoration over the more slow and costly work of sculptors, and it is on the broad wall-surfaces of this style that the painter will find his best opportunity. The experimental spirit now awakened in all countries will sooner or later certainly seize upon this style, and, as far as recent designs show, Germany may see her quick-witted rivals across the Rhine, convinced that the Golden Age of the Gothic is passed, return to and appropriate as their national style that very architecture from which they lured the Germans five centuries ago. Recent competitions seem to indicate this. In that for the construction of a Protestant cathedral in Berlin about twelve years ago, the designs, even domical and classic in plan, were chiefly Gothic, while the designs submitted in 1874 for the great church of Le Sacré Cœur, in Paris, were nearly invariably Romanesque. I am astonished to find, however, how little French architects have drawn material from the Rhenish Romanesque, since they have studied so thoroughly the kindred style in the south of France; but this may be accounted for by their general indifference to all art outside of their own country and Italy, and to the fact that in no works on architecture are the churches on the Rhine adequately represented. A more complete knowledge of the latter would certainly give a great impetus to their present efforts. The best books on this architecture are by Geier and Görz, Rosengarten, and Boisserée's "Nieder Rhein"; but the two former give small illustrations, and the latter is confined to Cologne and its neighbourhood. Hübsch, in his "Altchristliche Bauwerke" gives the Cathedral of Spires on a large, or rather coarse, scale, and in a German student publication there are outline drawings, on a large enough scale, of these churches; but it may be said that this Rhenish architecture has never yet been fairly illustrated. Magnificent as are Cologne and Strasburg, they are only variations of a cathedral type scattered all over Europe, and if pressed for time on the Rhine, I should urge the lover of architecture to sacrifice them rather than the true Rhenish architecture, which is unique.

PIERREFONDS AND ST. DENIS.

[SEE PHOTOLITHOGRAPHIC ILLUSTRATIONS.]

THE castle of Pierrefonds is the finest example we possess of a French fortress of the beginning of the 15th century, when artillery was just coming into use, and when the defence was vastly superior to the attack. It is particularly interesting to compare its arrangements with those of its older sister Coucy. In the latter, built in 1225, the arrangements are all intended for a powerful feudal lord who could count on a large permanent garrison of faithful vassals, and there is but little separation between the apartments of the Seigneur and those of his men. But when Louis of Orleans, brother of Charles VI., built Pierrefonds in 1390, the feudal system had already lost much of its vigour and a feudal lord could only reckon on the faithful service of his true liegemen and of those attached to his person, and while his ordinary vassals found substitutes to perform their military duties. Thus in time of peace the castle was held by a small garrison of faithful men, and in time of war by a large body of utterly untrustworthy mercenaries. Pierrefouds formed one of the most important links in the network of fortresses which Louis of Orleans established in his duchy of Valois as a base from which to overawe Paris and control the government during the madness of Charles VI. Built in 1390 it surrendered to the English in 1420, but in 1422 was again being held for the Dauphin. In 1591 it was held for the Ligue. In 1595, after having been taken by the king's troops, retaken by the Ligue by stratagem, and again besieged three times by Henry IV.'s army, it finally capitulated to his general. In 1616, its governor, having taken the side of the nobles, was besieged by Louis XIII.'s troops, who breached the walls with cannon. In the following year it was blown up by Richelieu's orders, in accordance with his plan of destroying the fortresses of the discontented nobles, and it remained a ruin till 1858, when Napoleon III. directed M. Viollet-le-Duc to begin its restoration. He wished it to be a specimen of the military art of the Middle Ages, and of the abode of a great feudal lord. About 5,000,000 francs were spent upon it and the greater part of the work was finished before the war; for M. Viollet-le-Duc, foreseeing the coming troubles, pressed the work forward as fast as possible and sacrificed many non-essential portions, like the turret over the clock in the sketch we publish, which has been carried out in a much simpler form. The restoration has, wherever possible, been based on what already existed, but in the part shown in the sketch, the N.E. angle of the courtyard, there was comparatively little to go by, so that we perhaps may look on it as being in some parts, at least, rather a complete example of a typical castle than as an exact restoration of what previously existed. The engraving is taken from an original study of M. Viollet-le-Duc's, in the possession of Mr. West. It shows the grand staircase of the castle which leads to the rooms of the permanent garrison on the first floor, and by the open corbelled gallery to the great Hall of the Castle, where the Seigneur dispensed justice or met his retainers. On the extreme right is an arcade and passage above it, leading to the chapel and to the Seigneur's apartments in the Keep. On the extreme left is seen one bay of the arcade, which runs along the whole front of the mercenaries' hall under the great hall, and in which they could take exercise, without being able to get into the castle yard through its bars. Above this is one window of the passage in entresol which looks the other way, *into* the mercenaries' hall, and which can only be entered from the rooms of the permanent garrison; so that they could always keep an eye on the untrustworthy mercenaries. On the ground floor in front are the kitchens and servants' offices. Above the roofs are seen the gabled ends of the latrine tower and the pointed roof of the angle tower Artres, so-called from the statue of the Preux which adorned it. In several points this sketch differs from the work actually carried out. Our other photolithograph shows the tympanum of the parish-church of St. Denis, some of the capitals in which we published a fortnight ago.

* * *

The town commissioners of Kingstown decided, on Monday, to proceed at once with the construction of a new road to Bray Head, in accordance with plans prepared by their engineer, Mr. Brett, C.E.

Building Intelligence.

Eastbourne.—A new apsidal-ended chancel just added to Christ Church, Eastbourne, was consecrated by the Bishop of Chichester on Saturday. The blank wall formerly ending the nave has been thrown down, and a chancel arch of Bath stone erected, opening into the chancel, which is raised two steps above the nave. The apse is groined, and is faced internally with white Piddington bricks, sedilia and bands of ornament being formed in deep red Dicker bricks. There are five windows, and the centre one will soon be filled with stained glass as a memorial to Princess Alice. The reredos is of alabaster, and was specially designed by the architects; the choir stalls are of oak, the floor is laid with Minton's encaustic tiles in patterns, and the steps to altar-pace are of plain white marble. A new pulpit is hexagonal in form, of Caen stone, with a capping of black Devonshire marble. A vestry has been appended to the east end of the aisle added last year on north side of nave. The architects were Messrs. Scott and Hide, of Brighton. The contractor was Mr. J. Peerless, of Eastbourne. The cost has been about £4,300.

Inchicore.—A new parochial hall is about to be built at Inchicore, a suburb of Dublin, and is intended to supply the want of a sufficiently large hall, suitable for lectures, public meetings, Sunday schools, &c. It is to be built of local limestone of dark colour, with dressings and steppings to castellations of granite. The architect is Mr. Alfred G. Jones, of 43, Stephen-green, East Dublin.

Leeds.—A new Presbyterian church at Leeds was opened on Sunday last. The body of the church is 62ft. by 46ft., and gives accommodation for 444 adults, allowing 20 inches to each, the pews all radiating from the rostrum. A gallery is provided at the lower end of the church next Cavendish-road, with accommodation for 156 persons. Under the church is a large schoolroom, and also book and store rooms. The style adopted is Italian, the principal front being divided into five stages. The façade is three stories in height, and has a rusticated basement of stone, with a superstructure executed in red pressed bricks, having some string-courses and dressings to arch-headed windows, the whole being finished at the top with a bold moulded cornice and blocking, and ornamented pedestals at the two corners over pilasters. The estimated cost of the building (inclusive of land) will be about £6,000. In the vestibule is a plaster cast, taken from a work by Flaxman in Bradford Parish Church. The entire works have been carried out from the designs, and under the immediate superintendence of, Mr. James B. Fraser, F.R.I.B.A., architect, Park-square, Leeds.

Metropolitan Board of Works.—At this board on Friday, an application was received from the Sunday School Union for permission to erect a statue to Robert Raikes on a site in the Embankment Gardens, a little to the east of Cleopatra's Needle. It was mentioned that the statue, of which Mr. Boehm is the sculptor, will be cast in bronze, and will be 9ft. in height; it is to be placed on a granite pedestal and base 11ft. high, and will, it is hoped, be ready for unveiling on July 3rd, 1880. The required permission was granted. It was decided to establish four additional movable fire-brigade stations similar to the one placed in Ludgate-circus, to be placed near St. Clement's Danes Church, the Royal Mint, Hyde Park-corner, and Vauxhall Cross, and also to telegraphically connect all the stations of the fire-brigade directly with the head-office in Southwark-bridge-road. The Works committee was ordered to bring up a report to the board on the steps taken by the board in reference to the Artisans' Dwellings Act, 1875 and 1879. A letter was received from the Royal Institute of British Architects, stating that the council have granted certificates of competency to perform the duties of district surveyor to Messrs. E. Marsland, G. G. Jarvis, W. Freeman, and W. H. Lees; and another from the promoters of proposed Woolwich and Plumstead Tramways, for consent to an application to the Board of Trade for a provisional order to authorise the construction of certain tramways in and between Woolwich and Plumstead.

Rothesay.—New public halls, built by ex-Provost Charles Duncan, were opened last week at Rothesay. The halls and front buildings cover upwards of 1,400 square yards. The front buildings are 5 stories high, rising to a height of 75ft. to the top of the centre Mansard, and having a frontage of 83ft. The style is Italian, from the designs of Messrs. James Hamilton and Son, Glasgow, and the whole work has been carried out under their supervision. The large hall is 84ft. long by 48ft. wide, with a height of 48ft. It will accommodate an audience of 1,367 persons seated. The roof is arched and plastered, and the lighting is entirely through it. The greater part of the basement under the main hall will be occupied as stores. The lesser hall will accommodate 300 persons, with adjuncts capable of accommodating 150.

Sheffield.—The "George Wostenholm Memorial Hall," Sheffield, was opened last week. The building is in the Italian style, and is of brick and stone. The leading feature is a tower at the north-west corner. The large hall is 72ft. long by 40ft. broad and 25ft. high. It will seat about a thousand persons. Mr. H. D. Lomas, of Norfolk-row, Sheffield, is the architect.

CHIPS.

The Darwen Town Council have appointed Mr. Wm. Stubbs, district surveyor, Pendleton, as engineer and surveyor to their borough, at a salary of £275 per annum.

A ladies' pavilion is about to be erected on the beach at Dawlish, for a limited company, from the designs and specification of Mr. G. S. Bridgman, and is to be opened on May 1st.

Men are now at work at Llandaff Cathedral in the erection of a chiming clock in the north-west tower, which will strike for the first time on Christmas-day. The clock is a memorial to the late Dean Blosse, and is supplied by Messrs. Gillett and Bland, of Croydon.

The Torquay local board have provisionally adopted plans for an infectious diseases hospital, proposed to be erected in Uptou Valley; the plans were prepared by Mr. Ernest Turner, and have been modified by Mr. Little, the board's surveyor, and are estimated to cost in execution about £2,000.

St. Martin's Church, Caerphilly, was consecrated by the Bishop of Llandaff on Wednesday. The new church has cost in erection £5,000.

A new Baptist chapel was opened in Carisbrooke-road, Kirkdale, near Liverpool, last week. It seats 400 persons, and cost about £5,000.

A Roman Catholic day-school is in course of erection at Penarth, by Cardiff. It will cost £700, and will accommodate 150 scholars.

The Waterworks Committee of the Town Council of Brighton have received a report from Mr. Edward Easton, C.E., announcing the completion of the new works of supply, at a cost of about £12,500. Mr. Easton adds, that experiments have shown that, with a slight exception, the whole of the town can be efficiently served by either of the two principal sources of supply.

The parish-church of St. George of Tombland, Norwich, is proposed to be restored in accordance with plans prepared by Mr. Ewan Christiau. The church will be refitted with oak benches, utilising the oak now in the pews, wood floors placed under the seats, the tower-arch will be opened out, and the west window shown; and the vestry and two porches restored; the blocked windows on south side of chancel opened out, the leaden roofs relaid, and the tower extensively repaired.

The new town-hall for Holborn, erected from the designs of Messrs. Isaacs and Florence, was opened by the Lord Mayor yesterday (Thursday).

On Saturday week an influential party, including the Mayor of Brighton, and the Chairman of the Commissioners for Hove, inspected a villa in the Third Avenue, West Brighton Estate, which has been built in accordance with the system of ventilation designed by Dr. Hayward, of Liverpool, who was present to explain the principles and mode of action.

A new market-house, erected at the cost of the lord of the manor, was opened at Alfretou, Derbyshire, on Friday week.

The ancient banqueting-hall of the Old Cock Inn, at Halifax, built in the later years of Elizabet's reign, was reopened on Wednesday week by a dinner, after restoration and decoration. The work has been executed by Messrs. Webster, under the superintendence, and from the plans of, Mr. Swiuden Barber, of Halifax. The stained glass was executed by Messrs. Powell, of Leeds.

More than Fifty Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period. The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation render its the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksel ers and news-vendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.C.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line of eight words (the first line counting as two). No advertisement inserted for less than half-a-crown. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

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N.B.—American and Belgian subscribers are requested to remit their subscriptions by International P.O.O., and to advise the publisher of the date and amount of their remittance. If the last-mentioned precaution is omitted some difficulty is very likely to arise in obtaining the amount. Back numbers can only be sent at the rate of 7d. each, the postage charged being 3d. per copy. All foreign subscriptions, unaccompanied by an additional remittance to cover the extra cost of forwarding back numbers, are commenced from the next number published after the receipt of the subscription.

Cases for binding the half-yearly volumes, 2s. each.

NOTICE!

The Christmas Holidays necessitate the publication of our next number on Wednesday, Dec. 24. All advertisements and other matter intended for that issue must therefore reach the office not later than 5 p.m. on Tuesday next.

Received.—G. H. Y.—P. E. M.—W. and H.—E. P.—O. and Son.

Knight 14th Century. (Our plates measure 11in. × 7in., and usually drawings for reproduction for that size should be 22in. × 14in. Whatman's hot-pressed white paper should be used.)—J. B. Wetenhall, Minneapolis. (Mr. H. L. Elmes designed St. George's Hall, Liverpool.)

Erratum.—In our account of the opening meeting of the Royal Institute of British Architects for the present session, in our issue of Dec. 5, we stated that "certificates of proficiency in the voluntary architectural examination were presented to Hugh Jaques and Mr. Lachlan." This was an error: the names should have been William Jacques and Hugh McLachlan.

Correspondence.

ON EASTBOURNE TOWN-HALL COMPETITION—AND ON LIMITED COMPETITIONS GENERALLY.

To the Editor of the Building News.

Sir,—It appears needful for some junior member of the profession to make himself heard on the subject of competitions.

The object of the members of the Institute and Association is now so thoroughly undisguised, and so determinedly and persistently worked for, that either the "unknown" must now speak out, or quietly resign the whole of the important works in the country to the monopoly of these two architectural clubs.

We all know the great and undeniable evil of the present system of conducting architectural competitions. But the members of local boards, &c., do not furnish the only, or even the principal examples of dishonest conduct in these matters. No competition-knavery can take place without some member or members of our profession reaping, or hoping to reap the benefit of it.

With deep and lasting shame must we own that the whole heart and soul of every such action rests in our own profession.

These local boards only gather what our people lose by dishonest self-seeking, petty spite, and jealousy.

See even the example set by our reputed heads and leaders. What is it you members of the Institute and Association do under cover of seeking to destroy these evils?—coolly propose to do away with open competition altogether, and to divide (in order that no preference be shown for any particular party) all public works between the members of the Institute and Association, and so great is your disinterestedness that you do this for the benefit of the profession!

To think that men like you can expect even personal advantage of permanent character from these tactics! Why even I, a mere young man, can tell you that success means ruin this case.

Why will you not take the real leadership? It is yours to take it by the mere exhibition of the commonest honesty of purpose.

Do not think "we have climbed the heights, let us stop the paths," but use your position for the common good, and try to frame some simple rules for our guidance. Say thus, and thus, and thus, must these local authorities do if they wish honest men to work for them. Simple and honest rules of broad and manly principles, unchoked with petty details.

Do this, don't sham it, and every honest man amongst us will support you.

But above all let there be no more such letters as that of Mr. Porter to the Eastbourne Local Authorities.

Are there two spirits, or one, in the following two examples?—

1st. Institute and Association to Local Authority.—Why be at all this trouble and expense? I assure you it can be done much more cheaply and conveniently. Throw over all these nobodies who have been working for you these last few weeks and give us the job. As many of us eminent ones as you like will give you the best fruits of our ability for £10 apiece.

2nd. Knavish Practitioner to Local Authority.—We've always managed to pull together so far, haven't we, old fellow (I can recommend this fizz)—now if you managed to drop me in for this job, it stands to reason that, with all my local experience, &c.—I am, &c.,

J. Bindon Carter.

Nottingham, Dec. 15.

Sir,—How very kind and considerate of Mr. Thomas Porter to suggest to the members of the Local Board that no one should be allowed to compete for the above, but the great F.R.I.B.A.'s and A.R.I.B.A.'s! Of course he thinks that ordinary architects, either old or young, have no right whatever to attempt to design "Town-halls, &c." For my part I consider there are quite as good architects in the profession, although they may not have the so-called honour of having F.R.I.B.A. attached to their name.

I should have thought that such great men would not condescend to trouble themselves about small competitions. The profession is a hard struggling one, and if Mr. Porter's suggestions are adopted, what is to become of the rising generation "who may wish to enter into a public competition which they have a perfect right to do"? I am not one of the competitors, but I have a great interest in the profession. Trusting that you will find room for these few lines in your next,—I am, &c.,

A Subscriber since 1863.

Sir,—I think Mr. Porter's circular calls for some notice. His suggestion to limit the evils of competition, by limiting it to the members of the Institute or the Association, is rather a cool one, to say the least of it. The outsiders who form nine-tenths (or more) of the profession, have equal right to share the evils, or participate in the profits of these chances. Considering, too, that all business centres have now professional associations of their own, to wit a few, Liverpool, Manchester, Leeds, Birmingham, Newcastle, Carlisle, Bath, Bristol, Exeter, and many a score of others, to say nothing of Ireland and Scotland, why should the architects of Eastbourne, and the Coast and neighbourhood of the South generally, be debarred from competing in their own locality; for how many of them, I should like to know, belong to either "the" Institute or "the" Association (to adopt the cant prefix of the metropolitan architects)?

There is a large and important competition shortly to come off in the Northern Counties. How would our friends like it to be announced that members of the Institute or Association would be excluded; it is quite possible to arrange it so.—I am, &c.,

B.

Dec. 15.

Sir,—In your last issue you publish a letter from Mr. Thomas Porter to the Eastbourne Local Board, in which he suggests that a small number be selected, and that all others be not allowed to compete; this may, or may not be wise. I will not attempt to discuss the question, but I do object to the proposal that the competitors be selected from the R.I.B.A. and the London Architectural Association.

Very few indeed would object to a proposal that the competition be limited to the R.I.B.A., but why bring in the London Architectural Association? it is in no sense a representative society, but simply a local association, doing, no doubt, good work amongst its members, but having no claim upon public notice.

If a selection is to be made, it must be upon a wider basis than the one proposed, for it does not acknowledge the existence of Liverpool, Manchester, Leeds, and other towns in the Northern and Midland Counties.

Perhaps Mr. Porter will tell us how the architects in these towns are to live if the scheme is adopted? Waiting for this information—I am, &c.,

Pro Rege et Lege.

Sir,—I read in to-day's issue of your paper Mr. Thomas Porter's letter to the Eastbourne Board of Health, relative to the recently advertised "Town-hall" competition.

The suggestions therein made are in some respects undoubtedly good, and will certainly assist to clear away the abominable practice of advertising mere "prize" competitions.

Now, while believing that Mr. Porter is thoroughly sincere in his endeavour to benefit and raise the standard of the profession generally, I think his proposition as it now stands is rather one-sided—calculated to benefit men of standing and experience, but the struggling "Junior," whatever ability he may possess, not having yet attained "a name," is to be excluded from competition work altogether.

I am not aware whether Mr. Porter has attained his professional standing through competitions, but I would call his attention to the fact that the majority of the very best men in the profession have been raised from obscurity by this means. Then, I ask, why should the coming generation be denied these privileges which our fathers have enjoyed? Mr. Porter's circular addressed to the "Fellows" of the Institute of British Architects, I think, contains a much more sensible way of dealing with the matter, viz.: "That 'Fellows' should abstain from competing in every case where they were not paid for their services." Mr. Porter remarks that competitions are "flooded with designs from juniors and inexperienced men." If these are to be excluded, as Mr. Porter suggests, I ask how are we, as juniors, to gain our experience, and to work ourselves into the foremost ranks?

Mr. Porter's method of limiting competitions would materially benefit the privileged few, but I query very much if it would not hinder the progress of the profession in the long run.

The question of dealing with competitions I know is a difficult one, and we are indebted to Mr. Porter for taking the matter up, but this way of limiting them won't do. Better, I should say, if every competition were limited to architects residing in the county in which the erection is to take place; in the majority of cases competitors then could be remunerated for their trouble.

As Mr. Porter is taking this question up so earnestly, and as he says "for the interest of the public and the profession generally," it would be a good opportunity if some of our professional authorities would offer a few suggestions as to a mode of rectifying some of the abuses, and almost insults, which are offered to architects, in a manner in which "juniors," instead of being excluded, may co-operate, and try to excel their more experienced brethren; for, according to Mr. Porter, they should be entirely excluded. They tell me that "practice makes perfect," also to "try again," and I don't feel inclined to be quashed for the fault of being a

Dec. 3. Junior.

A PLEA FOR IRELAND.

Sir,—It is with regret I read in Mr. Thomas Porter's letter, in your last number, that he suggests that the Eastbourne Town-hall competition should be confined to a few members of the R.I.B.A. and the Architectural Association; for while I agree with him that limited competitions are much to be desired, I would have been glad to see a more liberal spirit displayed by an English architect, by including the Royal Institute of the Architects of Ireland, which embraces in its ranks many men of high professional standing, some of whom have competed, to their own advantage, with their English brethren.

I am aware that a number of architects in this country have applied for instructions, and had Mr. Porter's letter been somewhat earlier, and adopted, these would have been excluded, and most unfairly so.

In any case, I think the R.I.A.I. should take precedence of your association, for it is a body of professional gentlemen, similarly constituted, although not so numerous, as the R.I.B.A.

In Ireland we very seldom have a competition of one kind or the other, but when any one of importance does, perchance, appear, it is a limited one, and includes some brethren from "across the water," for instance, the South City Markets, Dublin.

The R.I.A.I. are at present taking measures with regard to some new and important public buildings, to be opened to competition, and I, as one of that body, will be glad to see the result of our labours ending in a limited competition, which will include some good men from the other side.

Mr. Porter's idea of "selection" is like O'Connell's Act of Parliament through which a coach-and-four could be driven.—I am, &c.,

Belfast. M. R. I. A. I.

THE FUTURE OF PORTLAND CEMENT.

Sir,—Your correspondent "A. C. P." seems to doubt the fact of the cement efflorescing. In the cases within my experience the lime mortar has not acted in that manner, but the portions done in cement could be distinctly traced by that action. Burnell mentions this failing in his "Treatise on Limes and Cements, &c."—I am, &c.,

B.

MR. NORMAN SHAW'S WATER-CLOSETS.

Sir,—In reply to your correspondent "W." in your last issue, regarding Mr. Norman Shaw's water-closets, I beg to say that I adopted the system last summer, and have used it ever since with perfect success, there not being the faintest odour perceptible either in the closet or at the open grating on the top of the hopper into which the soil-pipe discharges. The soil-pipes, I may add, are fixed in the usual way on the outside wall and communicate with the rain-water conductor from the roof, which is, from the point of junction downwards, $4\frac{1}{2}$in. diameter; and although we have had recently a very severe frost, lasting over a fortnight, I have not found the slightest inconvenience. I was told when I adopted the system that I would have no end of trouble with it, and was advised to revert to the old plan; but so far as my experience goes, I am happy to say that the fears of those who then advised me have proved illusionary.

Mr. Shaw's system may not be adapted to all situations, but where it can be so adapted it is undoubtedly a great improvement over the old system, always, of course, keeping in view that a good substantial earthenware trap requires to be inserted between the open grating and the main drain.—I am, &c.,

Robt. Little.

Sir,—As I have lived in a house built from the designs of Mr. Norman Shaw for more than a year, and have had two winters' experience with what has been called Mr. Shaw's water-closet apparatus, referred to by your correspondent "W." in last week's Building News, it may be of interest to say that in my case the only inconvenience experienced is that the supply pipe is liable to burst, and this is very difficult to avoid in consequence of the immediate connection between the open air and the w.c. apparatus. It is a rather serious objection, and in my case resulted, both this year and last, in the bursting of the supply pipe immediately above its connection with the valve, a condition resulting from the constant admission of cold air through the outlet pipe, which stands over the open hopper or stackpipe-head outside.

In other respects the arrangement is in every way admirable, provided the hopper be not placed near the front entrance doorway or in any conspicuous spot, else the considerable noise which occurs when the plug is pulled up is excessively disagreeable, for the bubble and rush of water at once proclaims the public character of what is generally considered a private matter. Your correspondent "W." says he found the soil-pipe became blocked up with ice. I should say that such a result must have originated from a stoppage of the pipe from some other and more usual cause; the water and soil then being unable to pass freely away, became frozen, and so completed the difficulty which he describes. I should prefer to keep the soil-pipe quite outside the wall, as Mr. Shaw does, and allow both ends to be open, in which case no serious damage could result even if it were to become blocked with ice, as "W." says his did; for, after all, a pail of hot water would soon remove the obstruction. The only way to be secure against bursting of pipes, I think, is to keep water out of them, and this can be managed by plugging up the outlets in the cistern with long plugs, at the same time keeping all cocks turned on throughout the house. For this purpose of plugging I have used shaped pieces of wood; but I found by constant use that the part of the plug fitting into the pipe outlets became worn away, and so allowed a sufficient quantity of water to accumulate over the w.c. above referred to to cause a burst, so that now I am having some screw-sockets fitted to the outlet-holes, into which complementary screw-plugs are to fit, and thus prevent any leakage. With a view of being able to introduce salt into the pipes in the extreme event of a freeze in the pipes, the entire length of the plug in each case is made of pipe, and each plug is of sufficient length to allow of its use when the cistern is full of water, and thus a constant supply of water can be obtained throughout a long frost.—I am, &c.,

Maurice B. Adams.

DRAWING INSTRUMENTS.

Sir,—"M." has another letter in this week's Building News, in which he repeats that "framed set squares" of the description given by "Extiber," are not much used. I have not had as long an experience as "M.," and I have only been in provincial offices, but there they are almost universally used. You noticed in the Building News, about eighteen months ago, a simple but very useful little instrument, called a "scale set square," which is exactly what "M." wants, viz., a vulcanite set square with the centre part removed. After your notice, I obtained one, and find it very useful, as it combines the scale and set square in one instrument, and drawing the line and sighting the dimension is done by one movement. I advise "M." to try one of them.

I think an improvement on this instrument would be to make them in framed wood, with the scales on ivory slips let in, similar to the parallel rules so much admired by "M."—I am, &c.,

Junius.

Sir,—Whilst several of your correspondents are giving their views on the subject of drawing instruments, may I be allowed space for a few remarks?

First, I would point out to "M." that he seems to ignore or be unaware of the fact that draughtsmanship is necessary in other professions beyond those of architect and mechanical engineer. Surveyors and mining engineers are doomed to use not only all the instruments employed by the above, but also more complicated pieces of mechanism, such as the pentagraph, and more modern eidograph and vernier protractor.

I have found that the French curves which "M." denounces as "*useless*" are certain to be just the reverse if kept long enough, since farmers and builders in the good old days did not think it necessary to plant hedges and build walls in conic sections. Nor do I consider the cutting out of the centre "a *stupid thing*," as "M." would find out if he had a plan 9ft. by 6ft., and light only on one side.

As regards "rolling parallels," I should say that, judging from an experience of both kinds of work, they are invaluable to surveyors; but that the old T-square is the best adapted for architectural work. The T-square has another recommendation, namely, economy; as, with all due deference to the makers of rolling parallels, they might be made to pay at something nearer half the present prices.

Whatever may be the difference of opinion as regards the instruments referred to in "M.'s" letters, I think practical men will agree that there is room for vast improvement in two-foot rules. Why do not rule manufacturers make rules for architects and surveyors? A timber merchant has a rule not only containing the "slide," but provided with useful tables giving value of a load of timber at per foot. Even ironmongers have rules with tables giving weight per foot of bar iron, of given section or dimensions, and value per cwt. at per pound. Why, then, should not architects and surveyors have suitable pocket rules? Several improvements immediately suggest themselves for an architect's two-foot, namely, to put the bevelled edges *outside* instead of *inside*, then they would not become rubbed and illegible as the outside does at present; this would give a clean inside surface for recording useful memoranda, as number of bricks per rod, sizes of slates, number of slates per square, &c., &c. Let one of the four bevelled edges (say the ¾in.) be cut with the universal scale of 10ft. to a mile (44ft. to an inch). As one bevelled edge is graduated to show 1in. to a foot, let one long flat edge on *each side* be in 8ths, so that we find 8ths at once, instead of the 12ths and 10ths, which seem purposely designed to annoy.

I would willingly add a "wail" on the subject of the objectional wavy edges of drawing-paper, but fear a further trespass on your space.—I am, &c.,

C. R.

Cardiff, 15th December.

Sir,—As the subject referred to by "Soap and Water," and, by "Extiber" and "M." reminds one that dirty drawings are not unfrequent occurrences in architectural practice, it is probable that the profession will desire the rediscovery of causes, if any, not so generally recollected as they should be, the more especially so as it must be very annoying to have, say, contract drawings utterly dirtied into the very grain of the paper just as they should be ready to sign, and to have no time to make others in their place.

Soap and water, like many other good things, is very useful when it is wanted; but too much of it with draughtsmen will be as bad as too little, because damp hands will inevitably damp the instruments and drawings they touch, and render it doubly likely to take the dust, black-lead, and dirt generally; and not only so, wet sets black-lead, and also takes the size out of the paper, and also swells and raises its previously hard and well-laid surface, and makes it sure to be much roughed up by subsequent indiarubber, when of course it will be still more susceptible to dirt and black-lead. There are, however, some persons whose hands are always damp or moist, and therefore likely, washed or unwashed, to take the dirt and distribute it over the paper; such persons can hardly wash their hands too often, and should take extra precautions to prevent their hands coming into contact with the paper where avoidable.

Some persons needlessly dirty their hands when cutting their pencils. They should be cut with the knuckles of the hand which holds the knife pointed down to the floor, when the lead dust will not fall on the hands, but on the floor.

Some persons hold the opinion that a drawing should never be touched with indiarubber until it is finished, but it may be discovered that in extreme cases it is best to clean the drawings here and there where dirtiest before the dirt gets down into the grain of the paper, and by judgmatically so doing, almost any drawing can be preserved so that it can be thoroughly cleaned without injury either to the paper or to the drawing, while by neglecting to do so many drawings get irretrievably dirty.

In cleaning-up drawings, and more especially coloured ones, it should always be borne in mind that the white paper should be cleaned, and that the dirt on the drawing itself will not much show, and may be cleaned very lightly accordingly.

In pencil-drawing much depends as to how the lead adheres to the paper, and the lead which will enable a careful draughtsman to make the neatest and cleanest drawing will cause a careless draughtsman much trouble, because it will not easily be erased from the paper, while the lead which is so easily erased from the paper will easily be rubbed from the lines on to the surface of the paper.

Much depends on the choice of the best kinds of prepared indiarubber, and pencils, and ink-erasers, and paper cleaners, and the best are generally expensive (Faber's are good); and pretty much the same with pencils (Cohen's are, in my opinion, as good as any I have used for architectural drawing). The drawing-board should be of pine, perfectly free from inequalities of surface, otherwise any ridge will cause friction on the sheet above it, and show a black mark not easy to erase. T-squares should be hollow lengthwise, and hollow also on the under side about ¼in. when the arris only will touch the paper, and not even that except when the blade is pressed down with the left hand on the stock or blade as the case may be, according to whether the set-square is being used or not.

A pear-tree set-square wetted and held before the fire to draw it hollow on one side, will be the least likely to drag the lead on the paper, as its arrises only will touch; the next best is the open mahogany set-square.

The vulcanite set-squares I have found liable to get adhesive for dirt, and very difficult to keep clean, and if clean even then tolerably sure to drag the lead over the paper. Indiarubber should, in some cases, be washed frequently and well dried. Drawings which are about and in use for several months must get dirty without any fault of the draughtsman, because if a shelf or table be left for a week in a room where no one is it will be found covered with dust which we could write our name in, and we are supposed to eat a peck of dirt during lifetime, and therefore, a sheet of paper exposed for nine months to dust and indiarubber, and black-lead, would be more likely to dirty one's hands than one's hands to dirty it, and in practical working drawings, where the building, when erected, is the primary object, the keeping a sheet of paper over the drawing cannot always be conveniently adopted, and neither is it usually adopted excepting in special cases, while on the other hand it is a rare case when a really competent draughtsman cannot keep his drawings cleanable until finished, as such only requires ordinary care and sound judgment.

Many persons seriously injure their drawings by alterations, which should be made without any injury whatever, and be undiscernible when done, or nearly so, at least.—I am, &c.

Henry Ambrose.

CHIPS.

A cottage hospital was opened at Evesham, by the mayor, on Thursday in last week. It provides six beds, and costs £1,200. Mr. George Hunt was the architect, and Mr. Garrard was the builder.

Messrs. Jones and Ramsden, 27, Park-square, Leeds, surveyors, valuers, and architects, have, it is announced in Tuesday's *Gazette*, dissolved partnership.

The City Commissioners of Sewers decided, on Tuesday, to purchase houses on the east side of Monument-yard, at a cost of between £7,000 and £8,000, so as to make a new roadway into Pudding-lane.

There have been no fewer than 118 applications for the post of borough surveyor of Derby, although the new appointment is to be made at a lower salary.

The annual distribution of prizes to the students in the Gloucester School of Art will be made on Monday next by Mr. T. Gambier Parry. The drawings are now on view.

A new church has been recently erected at Water Orton, and fitted with a handsomely carved oak pulpit, reading desk and lectern. The lighting has been effectually carried out by the use of Messrs. Jones' and Willis's Hesperus lamp, the same firm having supplied the above-mentioned articles. Messrs. Bateman and Corser, of Birmingham, were the architects.

The Parsonstown town commissioners decided on Monday to carry out a main sewer through the southern portion of the town, in accordance with plans prepared by Mr. Kennedy, C.E.

At the first meeting of the joint infectious diseases hospital committee for Milton urban and rural districts, and Sittingbourne, held last week, it was decided to take steps for securing plans for the erection of an infectious hospital, with accommodation for 24 beds.

The borough engineers and deputations from the town councils of Blackburn, Darwen, and several neighbouring towns, visited Dewsbury on Saturday, in order to see some steam trams at work in the premises of the Steam Tramways Company. The trials were considered successful.

The Nenagh town commissioners decided on Monday week to take steps for the erection of a town hall; and as a preliminary have entered into negotiations with the owner of livery stables opposite the Provincial Bank for the purchase thereof as the site.

Intercommunication.

QUESTIONS.

[5980.]—**Rusty Instruments.**—My instruments have got very rusty, although kept in a dry place. What is the best thing to remove the rust without injuring the steel?—H. B.

[5981.]—**Overhead Stables.**—I shall be glad if some of your correspondents replying to queries on stable flooring (or other experienced readers) will kindly inform the writer of the best mode to adopt in constructing flooring, &c., for first-floor stables. The space with which I have to deal at ground level will be fully occupied by vans, &c., thence it is that I shall be compelled to form my stabling overhead.—A Subscriber.

[5982.]—**Extras.**—Can you or any brother-reader inform me what course to pursue in a case where the architect has had the accounts rendered of extras every two months, and is now delaying settlement of same without giving any reasons for so doing. The amount is six hundred pounds. Are you acquainted with a similar case having been tried, and the judge's decision of same? Can interest be claimed?—X. L.

[5983.]—**Colouring Bricks.**—I shall be glad of any information as to the means by which bricks are coloured blue-black. I have been told that any brick-clay that will stand sufficient fire can be burnt black or blue by the addition of some iron compound. What is the substance, and how applied?—V.

[5984.]—**Orientation.**—Would some of your valued correspondents kindly give me some information on the following?—I find on viewing the parish church of Old Eastbourne, in Sussex, built in the latter part of the twelfth century, of Transitional character, that the central lines or axes of nave and chancel form a slight angle to each other, the chancel inclining a little to the south. I should like to know if there is any particular reason for churches being built in this form. I see nothing to have prevented the nave from being built with its axis in a line with chancel if the latter is truly oriented. The church is dedicated to St. Mary.—P. Shaw.

[5985.]—**Mathematical Instruments.**—Which is the most correct way to draw parallel lines? Having just purchased a rolling parallel (best quality) from an eminent London maker, I felt rather disappointed on reading "Extiber's" statement—viz., "no draughtsman desiring accuracy would use a parallel rule for ordinary drawing." An answer to the above query will oblige—J. G.

[5986.]—**Sanitary Institute of Great Britain.**—Will anyone kindly give me information that would be a help in reading up for local surveyor and inspector of nuisance examination to the above institute?—Architectural Assistant.

[5987.]—**Ecclesiastical Publications.**—Will any subscriber kindly inform me whether there is any publication of drawings and descriptions of our English ecclesiastical buildings, such as Pugin and Le Keux's "Architecture of Normandy"?—Tomby.

[5988.]—**Box and Plate Girders.**—I wish to know how to calculate the strength of a box girder, such as are used for railway bridges, also the strength of a plate girder. Can any reader show me a simple method of working out same?—Learner.

[5989.]—**Colouring Portland Cement.**—What colours will combine with Portland cement so that when laid down in greenhouses, church porches, &c., will keep its proper colour. We have experimented very much with several colours and black, but either we have to put so much colouring matter in that it destroys the cement, or else the grey of the cement shows when dry. We find black the worst colour to deal with. We have just finished a series of experiments with different blacks, and have immersed them in silicate afterwards, when they either are too soft and melt away, or else the grey is superabundant.—Concrete.

REPLIES.

[5959.]—**Brown Ink.**—Will "N. P." kindly explain what is meant by "lining up"? Any remarks which might occur to him on the finishing of geometrical elevations would be gratefully received by one who has not had the benefit of a master.—J. G.

[5977.]—**Clay-Grinding and Brick-Making Machinery.**—I beg to inform "Newport" I have in use at my works a first-class brick machine, which makes the bricks from stiff blue clay, taken direct from the face at the rate of 12 to 14 thousand per day. Shall be pleased to show "Newport" the machine at work any day if he will give me three days' notice, or if he will send clay shall be pleased to make same into bricks, free of expense.—W. Gradwell, Brickworks, Barrow-in-Furness.

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STAINED GLASS.

Catholic Church, Barton-upon-Irwell.—Two aisle windows have been erected, one to the memory of Mr. Charles Cecil de Trafford, and the other to that of Mrs. Green. They contain figures of St. Charles the Good, St. Cecilius, St. Elizabeth, and St. John the Baptist, with small groups below containing incidents from the lives of the Saints represented above. These windows are by Messrs. John Hardman and Co., London and Birmingham.

St. Neot's Church, Hunts.—Messrs. John Hardman and Co., of Birmingham, have just completed the erection of another of the fine scheme of aisle windows in this church, given by Mr. Charles Percival Rowley, of Priory Hill, St. Neot's. The window represents the Raising of the Widow's Son.

Warwick.—A very handsome stained-glass window has just been placed in the east end of St. Mary's Church, Warwick. The subjects illustrated are: in the centre lights, The Supper at Emmaus and The Sermon on the Mount; and in the side lights, events from the life of Christ; in the tracery pieces are figures of apostles and prophets. The glass is executed in the 15th-century style of work in keeping with the architecture of the chancel. The window was designed and executed by Messrs. Heaton, Butler, and Bayne, of London.

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WATER SUPPLY AND SANITARY MATTERS.

Burslem.—On Tuesday afternoon the pumping station of the sewerage works at Burslem was formally opened. The mode of finally disposing of the sewage which has been adopted in Burslem is that of irrigation, for which purpose a farm containing 314 acres has been leased about two miles from the borough boundary. The works were designed by Mr. E. M. Richards, C.E., the borough surveyor, and have been constructed at a cost of about £25,000.

The Lower Thames Valley Main Sewerage Board.—On Wednesday afternoon a numerous deputation of persons, who consider that their property would be injured if the scheme of the Lower Thames Valley Main Sewerage Board were carried out, had an interview with the President of the Local Government Board, Mr. Sclater-Booth said he understood that the reason so large a quantity of ground was required for the sewage was that a nuisance, such as sewage, which would be imperceptible on a thousand acres, would be tolerable on a hundred acres. The deputation had placed before him in writing some very elaborate statements, which he would take into consideration and give them his answer in writing. He would only say that some means of getting rid of the sewage must be resorted to besides the river, and he thought that the whole scheme should be examined with forbearance and liberality.

West Kent Main Drainage Scheme.—On Tuesday Mr. J. Thornhill Harrison, C.E., one of the inspectors of the Local Government Board, held an inquiry at Bromley, Kent, into the application of the West Kent Main Sewerage Board, for sanction to borrow £37,320 for the purposes of sewerage. The board has already completed a line of sewer, under the superintendence of Sir Joseph Bazalgette, C.E., and Mr. Williams, C.E., from Bromley to the outfall into the Thames at Long Reach, below Dartford, at a cost of £200,000, and the additional amount required was to carry on the sewer to Beckenham, where by a short junction it would be able to discharge into the river the whole of the sewage of South Norwood and adjacent populous districts. The financial arrangements of the scheme were explained by the surveyor to the board, and Mr. Alfred Williams, C.E., described the nature of the proposed works. No opposition was raised to the scheme.

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LEGAL INTELLIGENCE.

Architects' Certificates.—At the Alfreton County Court, on Wednesday week, George Richards sued Richard and Valentine Hill, of Nottingham, for £16 3s. 8d., being balance of £728, under a contract for the building of eight houses at Tibshelf, in 1878. The chief point for the plaintiff was that no certificate as to the character of the work had been given by the architect, who was the second of the two defendants. The judge (Mr. Ffookes Woodforde) remarked that the greater part of the money had been paid under the contract, and therefore the plaintiff must have given substantial satisfaction. He was of the opinion that the defending architect ought to have given his certificate for the balance, and should therefore give a verdict for the amount claimed.

In re F. G. Helmore.—The debtor, who has presented a petition for liquidation, is an architect, surveyor, and builder, carrying on business at 23, Leadenhall-street, and also in Marylands-road, Paddington, and elsewhere. He is engaged in extensive building operations, and has 100 men in his employ. His debts are estimated at £23,000, of which £3,300 are unsecured, with assets comprising building materials and plant of the value of £1,500, and equities of redemption in mortgaged property. Mr. Willis, junior, on behalf of the debtor, and with the concurrence of creditors for £11,000, applied on Monday for the appointment of Mr. E. P. Everitt, accountant, as receiver and manager of the estate, and for an injunction to restrain actions. Mr. Registrar Murray, granted the application.

Pavement Lights.—Hayward *v.* Hamilton and Another.—In this case, Mr. Aston, Q.C., for the defendants, moved on Thursday week in the Exchequer Division, to attach the plaintiff for a contempt of Court, or to restrain him from publishing a certain circular calculated to damage the defendants. The circular is question is a verbatim copy of the *Times* report of the case, when tried before Mr. Justice Hawkins, at *Nisi Prius*, on Nov. 18, which appeared in our issue of Nov. 21. Mr. Aston complained of the inaccuracy of the statements in the circular. One of the questions left by the learned Judge to the jury, as to the novelty of the invention, was answered in favour of the defendants, the action being for an infringement of a patent for improvements in the construction of pavement lights—viz., "Whether, having regard to the state of knowledge at the date of the patent, it was a new thing to form and arrange a prism so that the light would be thrown forward in one direction by making one of the sides of the prism upright, or nearly so, and the other side inclined to it at such an angle that the light passing through the upper surface may strike the inclined side and be reflected completely, or nearly so, within the prism, and issue from the upright, or nearly upright, side in the direction required. Is that a new thing, having regard to the state of knowledge in 1871, the date of the patent?" Answer—"No." That was most material to the defendants' case. The verdict was a nominal one, but that was not stated in the report or circular, and the whole case would have to be determined before the Divisional Court. Now, the discussion of these points, *pendente lite*, was a contempt; and the circular had been forwarded to a Mr. Church, a customer of the defendants, who made an affidavit, and to other customers, and was calculated to damage the defendants' trade. The learned counsel said the shorthand notes ran as follows:—"Mr. Aston: A nominal verdict to be entered for the plaintiff on all issues?—Mr. Justice Hawkins: Yes.—Mr. Aston.—And all the questions to be open to me upon that?—Mr. Justice Hawkins: All questions which have been raised at the trial?—Mr. Aston: Of course, my Lord; I say that the verdict of the jury is found for me on the question of novelty.—Mr. Justice Hawkins: Nominal damages, I suppose?"—Mr. Justice Stephen said he thought the question whether the *Times* was accurate was immaterial.—Mr. Aston said the plaintiff's invention would have to be defined hereafter, and the patent was put in abeyance by the course adopted by the Judge at the trial.—After considerable discussion, Mr. Justice Stephen said: If people discuss the merits of a popular case before it comes on for trial, they are apt to create a state of public opinion very inimical to calm discussion. If this circular does an injury to the defendant's trade I should think it was a libel, and there is a corresponding remedy. These powers are conferred on the Court for the purpose of restraining a different class of publications from these. You may send out another circular to the people enumerated in Kelly's "London Directory," stating your view of the facts. Injunction is a serious thing, to be used when there has been attempted interference with public justice, or to redress some kinds of private wrongs. We make no order, and no order as to costs. We do not see any ground for granting the severe remedy we are asked to grant; but we do not approve the circular, or say that it is a correct statement of the facts. We do not see our way to granting an injunction, or to exercising our power of committal.—Application refused.

The Fall of Houses in the Tottenham-court-road.—The adjourned investigation as to the deaths of John George Martin and William Viles, who were killed by the fall of houses in Tottenham-court-road, was resumed last week before Dr. Hardwicke, at the University College Hospital. Michael Doody, one of the men injured by the fall of the houses, was first examined. He said: I reside at 18, Pancras-street, and am a labourer. I was employed at these houses one month, and remember both Viles and Martin. I was on the first-floor of No. 171 when the houses fell. Martin was also there, cutting away the chimney-breasts. I was knocked down and injured, and brought to this hospital. I cannot account for the accident, but I had heard it remarked that the place was not very safe. By Mr. Grain.—The breastsummer was a little rotten at the corner, and it was covered over with cement or something. It rested on two piers, the "scaly" part resting on the part now standing. I suppose it was covered to hide it from the surveyor. There was some roughness, and Mr. Shields, the foreman, gave instructions for it to be covered over.—Benjamin Hussey, a marine store-dealer, residing in Pancras-street close by, deposed to seeing bricks being removed on the morning of the occurrence from the breastsummer which he thought very wrong. He was induced to look, and thought the works carried on very carelessly. Moreover, he had heard two of the workmen remarking under his window that they thought the district surveyor ought not to allow the work to go on.—Robert Reynard, of 15, Luton-street, Edgware-road, said he was a carman, and was removing timber for firewood from the premises at the time of the accident, and saw Martin cutting away brickwork between Nos. 171 and 172. He was in the building when it fell, and his head was cut open.—The Coroner said he now proposed to call the gentleman who, at the desire of the jury, he had requested to make an examination of the premises with a view to an independent opinion as to the cause of the occurence.—Mr. Spencer Chadwick was then examined. He said: I reside in Parliament-street, and am architect to the London and country estates of the Marquis of Salisbury. I have examined the fallen premises in Tottenham-court-road, and have formed an opinion as to the cause of the accident. I think that the lowering of the floor displaced the brickwork in front and caused the front wall to fall. I do not think the district surveyor is in any way responsible. The district surveyor has no power to stop the progress of the works; he has only to see that the Building Act is carried out. A magistrate's order is the only authority for stopping the works. Before a district surveyor can take any action the matter must go before a magistrate, who has power to inflict a fine if the structure is proved to be dangerous—a point frequently not decided until after several remands. Mr. Grain: And in the meantime an accident may happen?—Witness: Just so; there is too much delay. The duty of the foreman when he received instructions about the breastsummer was to have seen that it was shored up.—Mr. Alfred Shields, the contractor for the works, recalled: I received instructions from the leaseholder, Mr. Lewis, to alter the first plans. I did not refer the matter to the architect. We had finished the floor on the Saturday, and on the Monday I received instructions from Mr. Lewis to lower the floor in the letter produced:—"23, Ampthill-square, Saturday night, November 15, 1879.—Mr. Shields,—Dear Sir,—I find there is an awful mistake in the rooms of the first floor, looking over the drawings this evening; a copy having been given to the superior landlord, it must be immediately rectified. I very much regret this mistake, but I consider you can lower the floors without interfering with the front girders by putting joists to take the floors, and lowering them down again bodily. I shall meet you at 9 on Monday morning. Yours faithfully, Lewis Lewis." By Mr. Grain.—I proceeded to act upon that authority. I did not consider there was any danger in making the alterations. I did not consult the architect as I did not know the architect's address. I was not aware that a pillar had come away the week previous to the accident. I was on the works at the time when the slip in the brickwork occurred. Mr. Shields, senior, recalled.—As foreman of the works for my son, I was aware that there was a disposition of the pier carrying the girder to yield, and I gave instructions for the men to put it right during their dinner-hour. It was pinned up with slate and cement. I did not tell my son, as I thought so little about it. It came away from the party wall. My son saw what had been done. I did not inform either the architect or district surveyor. There was a portion of the wooden breastsummer, the end portion, a little "scaly;" it was covered over by my directions. It is standing now.—By Mr. Grain.—Mr. Wallen, the district surveyor, told me to put in rocking shores, but I did not do so because I saw no necessity. The work was complete when he told me, back and front. No storey-posts were specified by the architect. I put a temporary story-post against the pier. It was put up by my directions by the man who was killed.—By the Jury.—I discharged the men because we had too many on the job. I never heard Maloney say the place was unsafe.—Julius Joyce, of 30, Kirby-street East, said he was in the employment of Mr. Shields, and gave notice to the district surveyor of the work before it was commenced, and left the plans at Mr. Wallen's office. He did not know what alterations the plans showed.—Mr. George James Thomas, examined.—I am chief clerk in the Dangerous Structure Department of the Metropolitan Board of Works, and notices of all dangerous structures received by the Board pass through my hands. I received no notice that these premises in Tottenham-court-road were dangerous. I have considerable experience in these matters. The notice generally comes from the builders or contractors, and undoubtedly they are responsible. The district surveyor merely surveys and gives instructions of what shall be done, but has no power to stop works. He becomes, in fact the surveyor of the Metropolitan Board of Works, by whom he is appointed. The witness here put in a variety of forms of notices which it is necessary to give for various purposes in carrying out alterations of buildings, and they showed that the Building Acts as they exist are so defective that there may be a delay of as long as 21 days before an order obtained under them can be enforced, and in the meantime premises may tumble down and serious accidents occur.—In answer to the jury, the witness stated that the falling of these houses was receiving the earnest attention of the Metropolitan Board of Works, as well as the anomalies in the Building Acts to which he had referred.—The coroner proceeded to sum up the evidence, and after showing the importance of searching inquiries into such occurrences, observed that one of the questions for the jury to consider was whether this occurrence was attributable to any criminal negligence on the part of any one. If so, they would have no alternative but to find a verdict of manslaughter. On the other hand, if they believed that it occurred from circumstances over which no one had any control, it would be their duty to say it had arisen from accidental causes.—The jury, after nearly an hour's deliberation, returned into court and handed to the coroner the following as their verdict:—"That the falling of the houses Nos. 171 and 172, Tottenham-court-road, was caused by the culpable negligence of the builder, Alfred Shields, and his foreman, James Shields, in carrying out the work intrusted to their charge, and by neglecting to carry out the instructions given by the district surveyor. The jurors regret the inefficiency of the law in relation to buildings in not giving power to district surveyors to stop works being carried on in a reckless manner. The jury further recommend that serious cases under the Building Act should be tried in a more summary manner before a magistrate assisted by a practical assessor, and that builders convicted of recklessness in building structures should be liable to a heavy penalty." The Coroner pointed out to the jury that a verdict attributing "culpable negligence" was tantamount to a verdict of manslaughter, and he desired to know if he was to understand it in that sense. After some further consultation the Foreman said the jury did not mean criminally culpable, but their verdict was intended to convey a strong censure on the negligence which had been exhibited in carrying out the works.

The Skirlaugh Church Libel Case.—Botterill and Another *v.* Whytehead.—In this case, recently tried in the Exchequer Division, before the Lord Chief Baron and Mr. Justice Stephen, which we reported last week, judgment was delivered on Saturday. The Lord Chief Baron said,—The plaintiff is an architect, and had been employed by a committee to effect the restoration of a church at Skirlaugh, near Hull. On the 8th of April, 1878, the defendant wrote to Mr. Bethell, a member of the committee, the following letter:—"Nunkeeling Vicarage, Bewholme, Hull, April 8, 1878. Sir,—I see in the *Hull News* of Saturday that the restoration of Skirlaugh Church has fallen into the hands of an architect who is a Wesleyan and can show no experience in Church work. Can you not do something to avert the irreparable loss which must be caused if any of the masonry of this ancient gem be ignorantly tampered with? Your great influence would surely have much weight in the matter." The first question arising in this case is whether this letter is *primâ facie* a libel and the subject of an action maintainable by Mr. Botterill against the defendant. And I am clearly of opinion that to impute to an architect employed in the restoration of an ancient church that he has no experience in the work in which he has been employed is in itself a libel upon the architect in the way of his profession or calling. I think also that the describing him as a Wesleyan adds to the injurious character of the letter, and further that to write of an architect that by his acting in the work in question the masonry of an ancient gem of art will be ignorantly tampered with is in itself also libellous, and will render an action maintainable. The defendant in this case seeks to defend himself upon several grounds. The first, that the imputation on the plaintiff of ignorance and incompetence in his profession is true in fact. He alleges in his statement of defence that "the statements of facts contained in the letter are true," and "the opinions expressed in it, whether right or wrong, were honestly held and expressed by the defendant." When, however, the defendant is called upon for particulars of these alleged defences, he says that "the plaintiff cannot show experience in church work—that is, of the kind which, in the opinion of the defendant, was requisite." This is no justification at all, for the imputation is that the plaintiff cannot show experience in church work, which obviously means the work in which he has been employed by the committee; whereas the justification is that the church work alluded to is of the kind which, in the opinion of the defendant, was requisite. Upon which it may be observed (1st) that it does not appear what kind of work was, in the opinion of the defendant, requisite, and which work may be totally different ffom the work in which the plaintiff has been employed. But further, the defendant's opinion may be wrong, and therefore the effect of the whole sentence falls short of a statement that the plaintiff cannot show experience in the church work in which he has been actually employed. If any doubt could be entertained as to the libellous character of this letter, the wanton and irrelevant statement that the plaintiff is a Wesleyan, and still more the injurious statement that if the committee persevere in permitting the plaintiff to effect the restoration in question, the ancient gem of art (as the defendant describes the church) will be ignorantly tampered with, clearly imputes to the plaintiff that which is injurious to him in his profession, and which is calculated to prevent the public in general from employing him in such profession. But upon the report of Lord Justice Bramwell it seems that he was of opinion at the trial that this publication was privileged. I do not feel it necessary to deal with this question; but I am at a loss to see, under the circumstances of this case, what privilege the defendant possessed—he being neither the patron nor the minister of this church, nor a member of the committee appointed to effect its restoration, nor even a parishioner—to interfere between the committee and the plaintiff in respect of the contract between them for employing the plaintiff in the way of his profession. But, however this may be, the question then arose whether there was evidence of express malice. Now, there is no subject in the law involving greater difficulties than this question of express malice. It was argued at the bar that if a man be informed of something to the prejudice of another, and which is injurious to his character if true, and if he *bonâ fide* believes in that information, that such his belief negatives express malice. I am clearly of opinion that if a man should receive information which is injurious, if true, to the character of another, he is not justified in publishing that information to the prejudice of him to whom it relates merely because he believes it to be true. He may believe it to be true, and will be guilty of malice if he publish it to the world; and he may believe it to be untrue, and yet may be perfectly justified in publishing it to persons with whom he is in communication, and with whom it may be his duty to communicate freely on the subject of the information he has received. These cases of libel contended to be privileged, and where the question of express malice arises, must each be decided upon its own particular circumstances. In the case of "Clark *v.* Molyneux," where the defendant had learned that the plaintiff, a clergyman, was about to preach a sermon for another clergyman, a friend of the defendant's and with whom he immediately communicated, it became his duty to state to him the information he received before the plaintiff was permitted to preach the sermon—not for the purpose of imputing criminality to the plaintiff, but in order that inquiries might be made, and that the plaintiff might justify himself to the clergyman for whom he was about to preach. The case before the Court is entirely different in its circumstances, and the learned Judge who tried the cause held, and I think most correctly held, that there was evidence of express malice, and that evidence was fairly and fully left to the jury, and the jury found, and I think properly found, that there was express malice; for in this case the defendant had no manner of interest in the question of the employment of the plaintiff to execute the work in question, which all mankind, or at least every admirer of ancient art throughout England, did not possess equally with himself. Then, lastly, it is contended that the damages (£50) are excessive. But who can say that the effect of this letter may not actually have been to prevent great numbers of persons from employing the plaintiff in the way of his profession? On the whole, therefore, I am of opinion that the letter is libellous, and that the verdict of the jury ought not to be disturbed, and therefore that the rule or conditional order must be discharged.—Mr. Justice Stephen was of the same opinion, and pointed out that there were two ways of looking at the letter in question; but it must be taken that the jury had found that it was written in a libellous sense, with the imputation that the plaintiff was unfit and would ignorantly tamper with the work. As to the defendant's justification, that amounted to what under the old pleading would be called an "argumentative plea." It was not so easy to see under what head of privilege this imputation came. The nearest seemed to be that of fair discussion of a matter of public interest; and if the defendant had criticised the plaintiff's plans or his character as an architect as expressed in work done or proposed to be done, this might be so; but it was going a long step further when he commented on work not yet done and alleged professional incompetence. He could not assent to the view that the learned Lord Justice ought to have nonsuited, and the ruling seemed to him almost identical with that of the same learned judge in "Clark *v.* Molyneux" in the Court of Appeal. There was some evidence of an indirect motive, of an ecclesiastical feeling which had led the defendant to say an uncharitable thing of Mr. Botterill. The circumstances of the case were not such as to call on the learned Judge to press strongly on the jury the fact that the plaintiff was bound to prove express malice in the defendant. The point of excessive damages was faintly put at the bar; and he did not say that perhaps a verdict with the payment of costs might not have been sufficient to vindicate the plaintiff's character, neither did he say what verdict he himself should have given, but he did not see that the Court were called on to set aside the verdict of the jury. The Lord Chief Baron: I ought to add that there is no doubt the defendant is a clergyman of high character, and I should be sorry to suggest that he had a deliberate intention to inflict a grave injury. But he has been betrayed, by haste perhaps, into some unfortunate expressions.—Rule discharged.

Our Office Table.

The decision of the Court of Exchequer in the case of Botterill v. Whytehead, reported above, should teach a useful lesson to people who are disposed to let invective do duty for argument. We do not mean for a moment to say that the proposed restoration of Skirlaugh Church by the plaintiff was not a legitimate subject for discussion, and it is fortunate for himself that the motives of the defendant have been unactuated by anything like malice. The fact doubtless was that, in his eagerness to protect what he deemed the interests of art, he forgot, for a moment, the rule of conduct which should guide a gentleman, and he has had to pay the penalty of his indiscretion. He is not the only offender among us—others better able to teach us art lessons have similarly sinned against good taste, and it really seems almost time to consider seriously whether a lamentable disregard for a ruined church or a crumbling façade, may not exist with a thorough intention of keeping the Ten Commandments. People in earnest about anything must, of course, speak strongly sometimes, but it is really unnecessary to have recourse to the vocabulary of Billingsgate. To impute to a man an inability to do work intrusted to him, and wind up by calling him a Wesleyan, is about as sound argument as hinting that a man is a thief because he has red whiskers, and we cannot but feel that if a wholesome regard is paid to the decision in question the claims of Art will not lose notice, and we shall have less noise made by people who really can do very little else.

The new session of the Civil and Mechanical Engineers' Society was opened last (Thursday) evening by an address from the President, Mr. William C. Street. The programme of the meetings, which are held on Thursdays, at 7 p.m. in the rooms of the Iron and Steel Institute, 7, Westminster Chambers, Victoria-street, is as follows:—January 8 and 22, papers by A. T. Walmesley, A.I.C.E., on "The Bridges of the Thames, at London." Feb. 5, "Corn Mills," H. Ellis Hill, A.I.C.E. Feb. 19, "The Fracture of Cast Iron," James Love, F.R.A.S. March 4, "The Beneficial Action of Mind on Matter," R. Harkness Twigg, M.I.C.E. March 18, "A Railway to India," B. Haughton. April 8, "Teredo and other insects destructive to Wood in Marine Works," Thomas Cole, A.I.C.E. April 22, "Roof Construction in the Middle Ages," Charles H. Rew. May 6, "A Small Colliery in North Wales," W. F. Butler, A.I.C.E. May 20, "Cement Manufacture," C. H. Driver, F.R.I.B.A. June 3, Annual Meeting.

The Knightsbridge new barracks are expected to be ready for the occupation of the troops early in the new year. Rapid progress is being made with the internal fittings, and we understand that Mr. James Hill, of Upper Thames-street, has just executed an extensive order for 526 of his improved locks, together with 200 latches and furniture complete, all of which have been specially selected by the War Department. It is a noticeable feature of these locks that the keys all differ throughout, and that every key has its own number, and a corresponding number has been stamped on the bolts of each lock.

Mr. Thomas Elsley, of Great Portland-street, is well known to architects and builders as the patentee of several articles of every-day use. One of the most important is the Balance Sash Lever, which is certainly a very ingenious contrivance for opening high windows without the objectionable cord and pulley hitherto so much used. The Balance Sash Lever has lately been fitted up in several important buildings, amongst others may be mentioned the whole of the windows throughout the New Natural History Museum, Kensington; the New Temperance Hospital, the Royal Naval Schools, Greenwich, the new wing of the London Hospital, and for Board Schools, both in London and the country.

Within the past few weeks on expedition has been sent into New Mexico and adjacent territories for the purpose of making archæological and ethnological collections for the Smithsonian Institution. While exploring the ancient ruins in the vicinity of the Indian town of Zuni, the party visited the latter place for the purpose of studying the habits and customs of the interesting natives. In the years 1539-40 several old Spanish expeditions, headed by Coronado and others, passed through this pueblo, among many others, and found one of the remnants of a Mexican race living in stone structures, or, more properly, an immense communal house, which according to tradition had been occupied for centuries. The same people, or descendants of the same race, still inhabit the place and practise the same arts which were practised in the time of the conquest of Mexico. The Smithsonian party made extensive collections of stone implements, articles of dress, utensils, and pottery. carrying away upwards of 2,000 specimens of aboriginal vessels alone. The art of moulding in clay has undergone little, if any, change within the past 400 years, and has been entirely uninfluenced by surrounding civilisation. Many vessels are modelled in imitation of owls, ducks, and other birds, and the ware is durable and artistically ornamented in colours. It possesses a high lustre, approaching glaze.

The exhibition of old masters at the Royal Academy will, we hear, be smaller than usual, but good. One feature of especial interest is the portrait by Holbein of Christina, Duchess of Milan, described by the late Mr. Wornum in his biography of the painter as "one of the most precious pictures in the world." At the Grosvenor Gallery the winter exhibition will consist of the works of living artists, divided as before into two sections of water-colour paintings and studies in pencil or crayon. The collection of studies is likely to be of considerable interest to art students as well as to the public. There will be numerous examples contributed by nearly all the great living masters of imaginative design, including Sir Frederick Leighton, Mr. E. Burne Jones, Mr. Watts, Mr. Poynter, Mr. W. B. Richmond, Mr. Sandys, Mr. Millais, and several others. In the water-colour section a feature of novel attraction will be found in a series of upwards of fifty drawings contributed by members of the Society of Water-Colour Painters of the Hague. These works, many of them of high quality, are comparatively unknown in England, and the opportunity of comparing them with English colour paintings has not before been accorded.

The Coalbrookdale Company have introduced an ingenious and important improvement in connection with stoves, which will very materially facilitate the fixing of tiles in fireplaces. By means of their new "slip-out" tile frames, tiles can be inserted or removed from the front, inserted or removed separately, and changed at pleasure. They cannot fall out, and no plaster is required in fixing. Moreover, the tiles can be set at any angle by means of the "Adaptor Grate Splays," supplied by the same firm in conjunction with the "slip-out" frames, the same grate being adaptable as a straight front, a recessed front, or a projecting front. The use of tiles in fireplaces has served very materially to remodel the English fire-grate; and since these embellishments, which add so much to the effect of the fireplace, do not naturally lend themselves to curved lines, a certain severity of outline has become necessary in the metal work to receive them. Thus "splays" and "interiors" have come to be well-known terms; but there has always existed considerable difficulty in adapting these several parts so as to satisfactorily fill the openings, some persons, for instance, preferring the appearance of the ordinary recessed fire, others a straight or flat one, whilst others would project the fire actually beyond the line of front of grate; whilst each of these, again, would vary the angle or inclination of the splays or cheeks. The appliances now offered by the Coalbrookdale Company afford an easy and perfectly legitimate method of accomplishing either of the above objects, and will, we think, be appreciated.

Last Saturday the works in connection with the long-promised railway tunnel under the Mersey were commenced by sinking a shaft on the Birkenhead side of the river. Two shafts are to be sunk, and a heading will be driven from each at the level of the lowest part of the tunnel under the river. From these points, if nothing occurs to change the opinion of the engineers, the tunnel will be cut through solid rock to the streets of Liverpool and Birkenhead, a length of some 1,500ft. The first contract, amounting to half a million of money, relates to the distance from Grange-lane, Birkenhead, connecting the London and North-Western and Great Western systems and the dock railways on the Cheshire side, and carrying a double line of railway under the river Mersey, terminating in Liverpool.

The late Mr. Cockerell's drawings, exhibited at the Institute Meeting last Monday, are instructive examples of careful draughtsmanship, almost unknown to the younger school of artists. Do we ever see now such clear and transparent yet carefully delineated drawings in colour as the views of the hexastyle Doric temple—probably that at Corinth or Ægina? The colour of the warm stone, and the deep azure of the sky, produce a rich effect. One point in these drawings that strike us is the exceeding fineness of the lines; indeed, we hardly recognise any. The drawing of St. Paul's Cathedral, showing the west front, is finely executed, but a little sharp in its perspective; the proportions, nevertheless, are well preserved. The view of the basilica at Venice is extremely good, and so is the drawing of a triumphal arch. A few excellent drawings of Roman and Pompeian decoration and figures exhibit the thoroughly classical feeling which permeated all Mr. Cockerell's works. In the frame of photographs showing residences erected from his designs, we notice Crawley Court, near Winchester; and residences at Harlow, Essex, and Datchet, Windsor. The first-mentioned is Elizabethan in detail, and this style seems to have been a favourite one with Mr. Cockerell. The house at Datchet is in Queen Anne spirit, with panels of stucco introduced in the brickwork.

Over 100 of the members of the Society of Engineers assembled last night at the Guildhall Tavern, Gresham-street, on the occasion of their 25th annual dinner. Mr. R. P. Spice presided; Mr. J. Bernays (President-elect for 1880), Mr. C. Horsley, Mr. A. Williams, Mr. J. Church, Mr. T. Porter, Mr. B. Latham, Colonel Cowan, Professor Glaisher, F.R.S., Mr. Littler, Q.C., Mr. P. F. Nursey, and Mr. A. Elgan (secretary) being among those present. The society was established in 1854, for the advancement of engineering science, and now numbers 400 members and associates. Before the company separated a testimonial, consisting of an illuminated address, a piece of plate, and a purse of £150, was presented to Mr. P. F. Nursey, who has recently resigned the post of secretary to the society. Having acknowledged the compliments of the chairman, who described the presentation of the testimonial as one of the most pleasing duties which he had ever had to perform in connection with his office of President, Mr. Nursey congratulated the society on the increase in the number of its members during the past year, and on its satisfactory financial position.

On Wednesday night, at a meeting held at the Society of Arts, Captain Bedford Pim, M.P., read a paper on the proposed canal across the Isthmus of Panama. He reviewed the proposals as to the various routes, and gave his voice in favour of cutting the canal from Monkey Point, 40 miles north from Greytown, to Nicaragua, thence to Lake Navigation, Rio Panaloya, to Lake Managua, and so to Realijo—in all, 290 miles. The cost he estimated to be on the outside £6,000,000, and he considered that the British third of the 3 per cent. interest on this amount would be vastly beneficial to the nation by the consolidation of the friendly feeling between this country, the United States, and France, and would, moreover, be only equal to the sum annually wasted on any vote exceeding £1,000,000 on the Navy estimates.

The mill-owners of Minneapolis are greatly perplexed by the volume of sawdust they produce, and not a little alarmed at a threatened law forbidding the present disposition of such waste by pumping it into the river. It is calculated that the sawdust from the summer cut of logs converted into boards at that place amounts to something like 300,000 cords—enough to furnish constant work for 150 teams to cart away. The millers say they cannot afford so heavy a burden of expense, and the river communities can as ill afford to have the river spoiled by the rapidly-accumulating refuse. Even the steam mills are unable to burn all their waste, and the owners of them would no doubt gladly unite with their water-using neighbours in turning over the surplus sawdust gratis to whoever would agree to cart it away. Three hundred thousand cords a year of good fuel is certainly worth an effort to save, and this is the product of but one locality. Who, asks the *Scientific Amerian*, will invent an economical mode of making sawdust marketable? And who will devise new applications for such materials? Most likely there are hundreds of easy ways in which such materials, now a burden, could be turned to profit if our inventors would only take the trouble to think of them and work up their practical applications. Such simple devices for utilising waste products are often the sources of large profits.

An account sent by the *Times* correspondent at Geneva of a scraper made of jade, lately found in the bed of the Rhone, is, in Professor Max Müller's opinion, very important. Professor Max Müller, however, points out that the correspondent is hardly quite right in calling this scraper a solitary specimen. Scrapers or cutting instruments made of real jade are very rare in Switzerland and elsewhere, but he has himself seen several beautiful specimens--among the rest, one found by Dr. Uhlmann, of Münchenbuchsee, whose collection of lacustrine antiquities, all taken out by his own hand from one and the same small lake, the Moossee-dorfsee, is perhaps the most authentic and most instructive collection in the whole of Switzerland. The *Times* correspondent asks whether, as true jade is never found in Europe, the Aryan wanderers could have brought that scraper from the cradle of their race in Asia? Why not? asks Professor Max Müller. If the Aryan settlers could carry with them into Europe so ponderous a tool as their language, without chipping or clipping a single facet, there is nothing so very surprising in their having carried along, and carefully preserved from generation to generation, so handy and so valuable an instrument as a scraper or a knife, made of a substance which is *ære perennius*.

Considering how frequent gas explosions are in houses, the recent reported case of Parry v. Smith is one of considerable importance, especially as the precise point had never hitherto been decided. In this case the plaintiff's masters had employed a gas-fitter to make some alterations in their cellar, and in doing so he had left the gaspipes in the cellar with some temporary connections. The plaintiff opened the cellar-door, and he was severely injured by an explosion of gas. Mr. Justice Lopes, after hearing an elaborate argument, decided that the defendant was liable; for that there was a duty attaching to the use of or dealing with a thing naturally very dangerous—such as gas—to use the greatest possible care, and that, irrespective of any contract between the parties, this duty made the gas-fitter liable for any damages sustained by the plaintiff.

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CHIPS.

An inquiry was recently held at Leyton before Mr. Arnold Taylor, inspector to the Local Government Board, as to an application made by the Local Board for sanction to borrow £6,000 for works of sewerage, and £1,000 for works of surface drainage. At the close of the inquiry the Inspector suggested that the Local Board should provide a general scheme for the drainage and sewerage of the district.

Additions have just been completed at the Ditton-street Board schools, Ilminster; the contractors were Messrs. Langdon and Poole, of Ilminster.

An inquiry into the proposed water supply of the town of Kirkby Stephen was held in that town on the 11th inst., before Mr. J. F. Smith, C.E., Local Government Board Inspector. Mr. Storey explained the scheme, and showed that, owing to the difficulties of procuring water, the supply pipes would be 5,000 yards in length. Mr. Davies suggested an alternative scheme for taking water from a bore-pipe at Winton, 1½ miles from the town.

Mr. John Lovatt, for 20 years engineer at the Colchester waterworks, died on the 3rd inst. at the age of 62 years.

A free library was opened at Wrexham on Wednesday week. The premises are the portion of the town-hall till recently occupied by the county magistrates, and the requisite alterations have been made for the Corporation of Wrexham by Mr. B. Owen, contractor, from the plans and under the supervision of Mr. Howell Davies.

The west window of St. Mary's parish church, Devizes, has just been filled with stained glass by Messrs. Hardman, of Birmingham. The subjects are taken from the Life of Our Saviour, and the cost of the work has been £340.

The portrait of Canon Farrar, hung on the walls of the Academy last year, has now reached its final resting-place in the dining-hall of Marlborough College, at which institution a museum of classical art has just been formed.

The Ilminster highway board have elected Mr. Shire as surveyor in succession to Mr. Robert Baker.

The long-talked-of drainage of the Shannon district was commenced, on Wednesday week, at Meelick, near Parsonstown. There the existing weir is to be removed, a new channel, 200ft. wide, cut for the river, and a powerful sluice erected for regulating the discharge of the water. After this, the Killaloe weir will be removed, and similar works carried out there. Mr. Lynam, of Ballinasloe, is the resident engineer in charge, and the Meelick is under the charge of Mr. Robert Young, C.E. From 400 to 500 labourers will find employment on the works for at least two years.

An inquiry was held at Lancaster on Tuesday week, before Mr. S. J. Smith, C.E., of the Local Government Board, with reference to an application from the rural sanitary authority for sanction to borrow £159 to carry out sewerage works in Glasson, in the township of Thornham. The engineer of the scheme is Mr. Jowett.

The chairman of the gas and water committee of the City Court of Common Council reported to the latter body last week the successful completion of the scheme for laying down hydrants in the City. The corporation had laid down 790 hydrants, and in addition to these 28 had been laid by the Commissioners of Sewers.

The Victoria station of the Metropolitan District line was lighted by the electric light for the first time on Monday evening. The lights are ten in number, and are maintained by the 20 horse-power engine of Messrs. Ransome, Sons, and Head, situate near Charing-cross, by which the 60 lamps on the Victoria Embankment and Waterloo-bridge are also fed. The Jablochkoff candle is employed. The experiments at Victoria are only to be continued for a few days, and are instituted by the representatives of the Société Générale d'Electricité, of Paris, the managing director being M. Jules Gaudet, and the engineer M. J. A. Berly.

Mr. J. B. Wilson, architect, West George-street, Glasgow, has been appointed architect to the School Board for the parish of Carluke, an appointment formerly held by the late Mr. J. L. Stewart. Plans for the new school at Yieldshields were approved by the Board at last meeting, and the erection of a new school at Kilncadyow is also in contemplation.

The prizes and certificates awarded to students in the Weston-super-Mare school of art were distributed on Tuesday week. The list included seven certificates in freehand drawing, two in model drawing, and two in perspective.

An inquiry was held at Keswick, on Wednesday week, before Mr. S. J. Smith, C.E., one of the inspectors of the Local Government Board, respecting an application from the Keswick local board for powers to borrow £10,000 to purchase and extend the existing waterworks. Mr. G. Watson, engineer, of Penrith, explained the scheme, to which no opposition was raised. The inspector struck out a clause relating to the supply of Portinscale, as that village is in the rural district, and informed the Board that, as the supply of some of the works were without their district, three months' notice would have to be given before operations could be commenced, however anxious the Board might be to provide employment during the present winter months.

Alterations and improvements are being carried out at the "big chapel" at Denbigh under a contract with Messrs. Hughes and Son, of that town, from designs by Mr. R. Owen, of Liverpool. The works include addition of apse, removal of pulpit, rearrangement of seats so as to radiate to the centre, and addition of a porch. The new English Presbyterian Church in the same town has just been roofed in, and the window-frames are being inserted.

The Margate town council have decided to purchase the undertaking of the local water company for £80,000; the transfer will be formally made on the 1st January.

MARBLE MOSAIC PAVING.

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THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 26, 1879.

HISTORICAL ABBEYS.

OF this grand class of structures still extant in Europe, very many are in ruins, a still larger number are mouldering, and few have undergone any modern process of restoration. To the last category belong, indeed, among those of historical importance, only those of Jumièges—three times restored—of Marmontier, of Niedermeister; of St. Peter, at Vienna; and of St. Martin-des-Champs, in Paris, which, however, was simply saved from destruction in order that it might be converted into a public library. Among the rest—leaving our own venerable Westminster out of view—their remains are scattered over Europe, and especially over France, in a more or less mouldering condition. That of the Bernadins, on the Loire, is scarcely less a relic than that of Kirkstall, near Leeds; but a wonderful epoch, alike in religion, manners, and art, must have been illustrated when the singularly composite edifices flourished at their full, though a majority of them were far from realising the popular ideal of Bolton, or had any such chronicles to relate as those of Battle. They were solitary buildings, remote from cities, inhabited by an order of genuine recluses, and shut out from the sight—almost from the hearing—of the world. Others, indeed, whose abbots wore mitres, became centres of population, so that towns sprang up around them; but the division between the two was distinct. Thus, those of Saint-Germain and Saint Antoine gradually grew to be suburbs of Paris. Originally, an Abbey was literally more than, as it were, a hive of cells, roughly added one to another, and presided over by a superior monk; but they rapidly assumed special forms of their own, and the plans of that of Saint Gall, laid down about a thousand years ago, are marvellous in their elaborations and completeness. They constitute, it might, perhaps, be said, a perfect microcosm, or epitome of human wants, so far as the builder's ingenuity could carry him. The name of the consummate architect who drew them, however, is entirely unknown. Their lines are simple and grand; every square yard of ground is utilised, without any unnecessary compression of details; and the whole suggests, at once, the ideas of severity and comfort. At Saint Regnier, appertaining to an even earlier time, within the circuit of mediæval walls, and beneath the clusters of mediæval towers, clear traces of Roman study, and even actual Roman arrangements, are visible, as in the baths, infirmaries, and separate chapels, temple-shaped roofs—not dissimilar, in fact, to some representations on the walls of Pompeii. Thus, the abbey architecture of Europe was of gradual and successive growths. Passing by the shrine of Edwin, at Canterbury, that of St. Germain in the Fields, outside of Paris, possessed, externally, all the aspects of a fortification, with ramparts, ditches, outworks, bridges, fortified gates, and a central edifice which was, to all intents and purposes, a citadel. This fashion, however, did not endure for any long period. The arts made their homes in the abbeys, adorning them with paintings, sculpture, and mosaic, their abbots became the architects, and their monks the masons, —though they sometimes changed places—who chanted psalms while they laboured, hauling enormous monoliths from the quarry, carrying on their backs loads of sand and stone, mixing cement, hammering metal, and laying pavements, like so many ordinary artificers of the present day. Thus, in great part, arose the great piles of Bec, of Saint Vanne, and of Saint Francis d'Assisi, in the Roman State. The placing of the first block in its position was always an affair of ceremony, an inscription was buried beneath that of St. Denis, and a valuable gold coin deposited in a hollow excavated in that of Belleville, at Beaujolais. So with those of the Grand Carmelites, and the Celestins, at Paris. Frequently, these corner-stones were deeply engraven with the sign of the Cross; but a distinction was sometimes drawn between the ceremony of laying the "first," and that of laying the "corner" stone. When finished, however, the structure was, when on a large scale, expected to be one in which a considerable community could dwell, altogether independently of the outside world, with its fortifications, if necessary, churches, chapels, cloisters, summer and winter refectories and dormitories, libraries, vestries, schools, gardens, fish-ponds, and so forth; the official enumeration reaching to nearly sixty different details; but a great variety of plan existed, as between the East and West of Europe, and in France itself, the Abbey of Fontenelle being in strong contrast with that of Saint George of Bocherville, while that of Souillac, with its circular wall, resembled no other in the country, least of all that of Saint Regnier, built in the reign of Charlemagne, which was triangular, as symbolising the Holy Trinity. For others, again, polygonal outlines were adopted, and in rare instances, the Abbey was built on both sides of a river, its detached parts being connected by means of a covered flying bridge. An example of this was formerly to be seen at Soissons, as well as at Manbuisson. But it was in France that the fortified abbeys, as a rule, were most numerous, except in the East of Europe, where they were often liable to attack. In Italy, for the most part, they were simply walled in, without battlements. Those of Mount Athos, on the other hand, were not merely strong in the common sense of the term; they could mount artillery in their towers, each being placed under the protection of a particular Saint or Martyr. The Byzantine Monasteries, or Abbeys—as they may be really designated—occasionally had one gate of granite or marble advanced in front of another, so as to constitute a kind of outwork—an example followed at Megaspybon in the Morea, and at St. Agnes, St. Sabina, and St. Cecilia, at Rome—all fading remnants of the past—once brilliantly adorned. Thus when Roman architecture of the modern type, was at its height, the porch of an Abbey was regarded as scarcely less important than the gate of a city—as witness those of The Ladies, at Caen, and Cluny, at Paris, bold adaptations of antique art, decorated in arabesque, of which traces are still visible among the ruins of Vaux-de-Cernay, near Chevraux, and those of "the great house of St. Peter," at Auxerre, where all the riches of the Renaissance imagination would appear to have been poured out.

The illustrated gates, so to call them, of the old abbeys, whether embellished with sculpture, painting, or mosaic, were, as M. Lenoir has pointed out, generally designed to indicate the order to which the structure belonged. Thus, on the Cœlian Hill, at Rome, on the door of the Convent dedicated to the Brotherhood of the Redemption of Slaves, is a mosaic representing Christ standing between two chained captives—a white man and a negro. On those of Saint Martin, at Marmontier and Auchy, near Aumale, the founder is represented on horseback. The Stags of the Mathurins, Paris, commemorate the vision of St. Martha, while, on the tympanum of the Great Carmelites, an immense picture exhibits Saint Louis on the Syrian coast, embarking the Mount Carmel pilgrims for France. Within, the exterior aspect was usually exchanged for another, but in one or two different ways. Either the gorgeous gateway led from a circuit of massive walls and threatening towers—like those of Saint Katherine on Mount Sinai—to an interior of simplicity, humility, and peace; or to one of luxury and splendour—aisles of porphyry columns; sacred furniture of precious metals in the solid, displayed on altars of costly wood; golden and silver images set up in sculptured niches, as at Grelto Ferrara, Rome, and Saint Zenone, Verona. Many of these edifices, in their ancient abbacial character, have disappeared, to make room for comparatively modern churches, but their records, or cartularies, in frequent instances survive. The mosaic of St. Gall, with its flagstones of green and crimson porphyry—an example of more than pagan magnificence—were wrought into the structure of St. Clement's, and the alabasters, marbles, and bronzes of Torcello were appropriated from an ancient monastic palace that had long disappeared from the site. In course of time, indeed, the Abbey, from exhibting most of the features of a feudal stronghold, had itself come to resemble a church, with its foundation, traced in the Latin form, though the variety was still remarkable, as illustrated by San Zenone, of Verona, St. Ambrose, of Milan, San Miriato, at Florence, and several others, most of them now ruined, in Sicily. More than this, when disused as monasteries they were recognised as abbey-churches. Such, originally, were St. Benedict-on-the-Loire; St. Remy, at Rheims; St. Hilary the Great, at Poictiers, St. Saveir, Cluny, and nearly every similar edifice in Auvergne. At first, of course, the church was an adjunct of the abbey, and in proportion as the latter was wealthy and powerful, the former was spacious and splendid. Those of Cluny, Fleury, and Vézelay, building upon immense estates of their own, constructed their sacred edifices with porticoes, for instance, sufficiently vast to contain an entire procession, however large, without crowding or inconvenience. The porch of Cluny was almost a church in itself—a hundred and ten feet deep and a hundred feet high. It had a nave and two aisles; but these, of course, were institutions of the first order; those of the second rank could afford neither such hospitality nor such pomp. Still, among them, the ruined porch of Saint-Martin-d'Auchy, though it could never claim comparison with Vézelay or Fleury, suggests no slight degree of opulence on the part of the brethren. These ruins, however, are mouldering out of sight, day after day. Some years ago, the Count Montalembert made an appeal on behalf of the beautiful old abbey of Cherlieu, in the Department of the Upper Saone, but the Council-General of the Department refused to undertake the work, and, as no single individual could arrest the progress of so long-established a decay, the time cannot be far distant when a few remnants of tottering wall, and two or three broken arches will be all that is left of that most characteristic monument. So the mosaics d'Ainay, the stately remains of Brantôme, the double choir of Clairvaux, the exquisite pavement of Saint Gormer and de Longues, the polychrome decorations of Saint Médard, at Soissons, the coloured tesselations of Saint Martin, at Pontoise, and the unique mural paintings at the Abbey of Révscamp—favourite resort of French artists—are all threatened, and scarcely any public, or even local, interest appears to be felt on the question of their preservation. Reference has been made to a statement of the late M. de Montalembert, with respect to the vast and famous Abbaye de Cherlieu—the most superb edifice of its kind in the whole of the Franche-Compté. In that document, its writer pointed out how much more was being allowed to perish besides the bare walls and roofing of the structure itself: the tombs of the Counts of Burgundy, and their wives, and of the Fourth Otho—last of the Princes of that House, who reigned over them, and whose obsequies were solemnised there in the year 1310, in presence of four bishops, twenty abbots, three hundred knights, and three thousand gentlemen. The Abbey itself was founded so far back as 1131, and M. de Montalembert asked whether the people of the Franche-Compté had abandoned all pride in this, the chief historical monument and glory of their Province. But the good folk in authority replied to the effect that little interest could attach to a structure of such recent date, and declined to adopt any measures for arresting the process of its dilapidation, albeit that, except, perhaps, at Luxeuil, there exists in the entire department of the Upper Saone no specimen so complete of that which is described in French text-books as the Transition from the Roman to the Ogival style. It may be too much, however, to speak of Cherlieu as altogether a ruin; it is rather ruinous than ruined, and in a few years, will have gone the way of "The Man's Abbey," at Caen, and San Vincent—San Anastasi's at Rome. With the gradual disappearance or modernising of these edifices, will be practically blotted out an important page in the architectural annals of Christendom.

VERY LIMITED COMPETITIONS.

Mr. THOMAS PORTER'S letter, published in this journal a fortnight since, has provoked a storm of protests from the profession outside the pales of the Institute and Association. Last week we published no less than half a dozen letters on the subject, and many more reached us for which we are unable to find space. In some recent observations we made on Mr. Porter's propositions published in the Building News lately, we anticipated the feeling that has been expressed in the letters of our correspondents. Bad as the modern system of competitions may be, it is obvious that both those who declaim against them and those who profit by them are not desirous of being shut out. The MM. R.I.B.A. are as eager as those who have not the honour to belong to that body, to benefit by these scrambles for professional distinction. As Mr. J. Bindon Carter says, "no competition knavery can take place without some member or members of our profession reaping, or hoping to reap, the benefit of it." We firmly believe that no good architecture can be produced by offering prizes in the manner open competitions are conducted; at the same time we must consider what system have we to take its place, that may give better results. Would better art be produced if competitions were totally abolished, and the big jobs went to the favoured few, or the more fortunate men in the profession? This would follow undoubtedly as a consequence. The men who could give the best work, the conscientious art-architect who now competes, but who is often reticent and modest in his pretensions, would be practically excluded. The very class of men who now and then come to the front by dint of their personal effort would have less chance of winning their spurs, or of emerging from the obscure ranks of architects' assistants. The Institute's dignified course would be to formulate a body of rules for guidance of competition committees, not to endeavour to limit these contests to members of their own body. By so doing they are courting a position they affect to discountenance. The correspondence we have published on this question has arisen in consequence of a letter addressed by Mr. Thomas Porter, F.R.I.B.A., to the surveyor of Eastbourne, which we published the other day. Mr. Porter would, according to this communication, limit the number of competitors for the new Town Hall to six or a dozen—half that number being selected from the members of the Institute, and half from the members of the Architectural Association, and asked that no premium be offered, but that each of the successful competitors should be paid £10 each, honorarium, to cover expenses. Mr. Porter's views, as expressed in his circular letter we published lately, were in the main very sound; but we think his last letter to the Eastbourne Local Board calculated rather to frustrate the good intentions he may have in view. It looks too much as if the architectural societies wished to monopolise competitions. We can endorse the two first recommendations; but when the third suggestion is made it damages the lofty and disinterested position the Institute is supposed to take. This is more surprising from the circumstance that in Mr. Porter's first circular, it is suggested that no members of the Institute should compete except in limited competitions; in short, we have first the open competition system denounced as a bad one, and the suggestion that members of the Institute should be debarred from competing under it; we have now the second proposal to limit competition to members of the two London professional societies. We are afraid the inference to be drawn from the two recommendations will be unfortunately interpreted. The general tone of the letters we publish is clearly indicative of this conclusion, and Mr. Bindon Carter's letter puts it into a nutshell. But there are other objections to the course suggested to the Eastbourne Local Board, and two or three of our correspondents have hinted at them. Why should the architects of Eastbourne and its neighbourhood not have a chance of competing for a building, the requirements of which they ought to be the best judges? This is centralisation in art that must invariably be fatal to its progress. The letters of "Pro Rege et Lege," "Junior," and "M.R. I.A.I.," show the gist of opinion upon this point, and the kind of reasoning the younger men of the profession will adopt. Again, why should not the architectural societies of Liverpool, Manchester, Leeds, and the North be placed on equal footing with the London societies?—a question that will occur to all engaged in the provinces.

Shortly, we believe, the proposition of Mr. Porter will be discussed by the Institute, and the profession will have, therefore, an opportunity of ventilating their opinions. We hope, in the interests of reform which every architect will welcome, no precipitate steps will be taken that will have the effect of estranging the members of the profession out of doors. If the Institute is to be useful it will be by co-operating with other societies in publishing a code of regulations for the guidance of architects and boards in open competition as it at present exists. We may here suggest three conditions that ought to be introduced in any rules that may be published. The first is that not only should drawings submitted in competition be drawn to a uniform scale, but that perspective drawings (if submitted) be also to one scale, and to insure a uniform size it would be necessary that the point of view be selected and the distance from that point to "picture plane" determined. Our experience of competition designs have shown us the absolute necessity for a provision of this sort. We have seen in town hall competitions perspectives of all sizes, and in the recent Ipswich, Great Yarmouth, and Ramsgate contests there were some of the perspective exteriors, drawn to, at least, twice the size of the scale which ought to have been preserved. There is a decided unfairness in such procedure, as a large cleverly-coloured perspective view has an influence over the popular mind that it ought not to possess. Then we should also define in the instructions to architects the colour (if any be allowed) that ought to be employed. The clause "drawings to be in line or sepia only" is one that does not, according to our experience of competitions, work well. All kinds of neutrals and browns are introduced verging on colours; in fact it is common to see blue skies and browns and reds indicated under the term of sepia tinting, which is now construed in the widest sense. Another suggestion will, no doubt, be considered in Mr. Porter's proposal, we mean that the selection of the design should be left in the hands of the competitors themselves, who should be allowed to record their votes for a certain number of other plans besides their own, failing which, reference to be made to a professional man of acknowledged taste and experience. There is one undoubted weakness in the appointment of professional referees, and one or two recent competitions have shown it. It is impossible to appoint an able architect who has not a decided leaning for one or other of the two great phases of architectural thought, and the best man might consistently look at a design, after all, in his own manner, however free from bias or feeling he may be,—a danger which the results of a few recent competitions have shown. We need hardly point to the effect of announcing the name of the arbitrator in the instructions issued to competing architects. In quite a recent instance, that of Over-Darwen, the intention of employing Mr. Waterhouse as referee had the practical effect of influencing nearly all the competitors in favour of some phase of Gothic. It is needless to say that many able men would be excluded by this knowledge.

ARCHITECTURAL EXAMINATIONS AND TRAINING.

ONE of the many professional questions which press for a settlement is the proposal to test professional qualification. Both the Institute of Architects and the Sanitary Institute have, as we have lately seen, been discussing the matter of granting certificates of competency to those who desire to become members or candidates for surveyorships. The schoolmaster is certainly abroad, and professional societies are beginning to see that with the technical and Board schools in our midst there is a pressing need to do something for their ranks, if they are to hold their own against the artisan of the future. As regards the Institute proposal, we may observe the movement is not new, but has grown out of the cry raised years ago for an architectural diploma. The "voluntary architectural examination," most of our readers will remember, produced less than a dozen candidates the first year it was established; in 1870 a new class of "preliminary" was added to the "proficiency" and "distinction" stages, with the result that about half a dozen passed the ordeal. The result, in fact, proved the failure of the system, and showed that the profession was not in a ripe state for its adoption. With greater inducements, and after the experience of a few years, better results ought to be looked for.

The difficulty, as put by Mr. Whichcord in his opening address at the Institute, was "what should be the character of such compulsory examination? Ought it to test the general education of a candidate, or should it be strictly professional in its details?" To this question there will probably be several answers, and it would be a useful step towards solution if during the coming sessions of the architectural societies, both in London and the provinces, the kind and scope of the examination were considered, and the opinions of the several societies obtained. The special committee of the Institute, which has been making inquiries into the subject, may have already come to a decision upon the point, and the report to be published shortly will, no doubt, furnish some information. In the mean time, we think it would further the object if members of the profession, and the younger men in it especially, would make known their opinions and feelings, and we shall be glad to open our columns to the discussion of the matter. A first step towards the solution will be whether the general knowledge of the student ought to be tested. In a perfected system general knowledge, no doubt, ought to receive recognition; but in the present tentative test for membership, it will probably be desirable to limit the candidate's curriculum to professional or technical requirements only, such as a knowledge of the properties of materials, their chemistry and physical peculiarities, and the science of construction generally. A greater difficulty, of course, arises in determining the artistic capacity of the student; but as we have hinted before, this need not be considered of such vital importance. The young man with artistic taste and culture will always command a larger share of purely art patronage than his less-gifted brother, but both will be put on an equality in respect of the essentials of professional knowledge, and the public will be better served. It has been urged by those against examinations that the artistic genius will be the sufferer; but the notion is a fallacy, as natural ability and aptitude are always sure of winning distinction, as at the Bar and in medicine. The attempt to establish academic art education would be a very different thing. The late M. Viollet le Duc strongly protested against the academic panacea as adopted in France, and with good reason, for, as our readers know, this kind of distinction trammels the student, and leaves him little better than a copyist. Under this system the young architect has to seek powerful protectors; he is helpless to pursue any independent phase of art as the architects in this country are free to do; if he has an opinion of his own, he must keep it in the background. We point to the effects of the teaching of such bodies as the Academy of the Beaux Arts to show how fatal to independent and vigorous art any attempt would be to submit the young architect to any one-sided teaching in artistic matters—to a kind of patented mediocrity in style and culture. Any attempt to establish a test of proficiency in artistic work must, we repeat, be a failure. If attempted by the Institute single-handed it would be preposterous. But the education of young architects is a question, we submit, that must have a wider bearing than that of being identified with the membership of the Institute. The subject is a national one. Prussia, for more than a quarter of a century, has had her technical schools for architects and engineers; Switzerland, Belgium, and Holland are all in advance of this country in the educational training offered to the architect and engineer.

It is worth inquiry, how far elementary art can be taught without infringing upon the natural proclivities of individual taste? The elementary drawing taught in our schools of art leaves little to be desired: it develops the natural capacity of the pupil without restraint. Geometrical drawing and freehand are the two kinds of exercise that may well be made the groundwork of the artistic education. Architects are divided pretty much upon the question of the use of instruments as an aid, and we need only refer in proof of this to the correspondence that has been going on in our pages during the last week or two. It is evident from the opinions expressed that the instrument plays a very variable part in the architect's work. Some draughtsmen use their instruments very little, and trust almost entirely to their eyes and hands, while others appear not to be capable of drawing a line without their use. It has been said, a real artist never complains of his instruments, any more than a good workman does of his tools; but we cannot always take this as an invariable test in architectural work, as we have to deal with some kinds of design that demand a larger use of the instrument than others. Many of the complaints we hear of imperfect drawing instruments, may proceed, as we have reason to believe they do, from those who are scrupulous and intelligent in their work. There are indolent and careless, as well as capricious and fastidious artists, and it is a fact that the artist who works largely by his hand and eye is less patient with his mechanical aids than he who relies almost entirely upon them. The relation of instrumental drawing to elementary art-teaching is rather more intimate than it may appear. There is a large class of architectural forms, such as mouldings, upon which a test of capacity might be based; and the question naturally arises what amount of aid should be derived from geometrical analysis in drawing these forms? It would not do to require one student to describe an ellipse, or some ovoid curve, with the unassisted hand, and to allow another instrumental aid. Again, there are many varieties of architectural ornament which require an expert knowledge of geometry, other kinds that can only be properly delineated by the hand. These tests of skill in drawing might be carried to any extent, but it is necessary to limit them somewhere; that is to say, the power of freehand might be made a useful test to judge of a candidate's ability to draw ovolos, and other sorts of Greek and Gothic mouldings, but there ought to be a minimum aptitude for geometrical method. Hence we should recommend largely in our technical art schools, the importance of geometrical ornament in which both symmetry and variety are elements, and the beautiful kinds of arabesque decoration afford a good natural practice, without verging on Classic or Gothic. Colour, too, should count for much in art-teaching. The old lines upon which coloured decoration has been taught are almost useless now. It must now be taught upon the principles of an advanced science. The harmonious interchange and effect of colours upon the retina must be made the foundation of the future theory of colour-decoration. We have now two views of colour—that of the artist and that of the physicist; the former generally bases his study of pigments upon the old arrangement of three primaries—red, blue, and yellow, a division that has been questioned, though it may be taken as correct enough for the practical wants of the colourist. A more scientific view of the subject is that derived from the spectrum analysis, or the coloured constituents found to be produced by the decomposition of a ray of transmitted light, the distinguishing colours of which are red, green, and violet, while yellow and blue are found to be both compounds. But what is more important that the designers of colour-decoration should know is that certain colours or tints stimulate the optic nerve, and produce either pleasurable or fatiguing emotions. They are, in fact, to be regarded according to the most recent theories as the "analogues of musical tones," and hence colour harmony consists in an arrangement of tints that stimulate the eye in the least fatiguing manner. Mr. Grant Allen, in alluding to this subject, speaks of the famous harmony of colours produced by the Italian painters namely, red, green, and violet, three colours which agree with the analysis of the physicist. Space forbids our pursuing this interesting subject further, our object being simply to indicate the direction these studies should take in any recognised system of art-training.

LIGHTNING-CONDUCTORS.*

Our own "Intercommunication" column has borne witness frequently enough to the uncertain and conflicting opinions which still find utterance with regard to the theory and practice of erecting lightning-conductors. We are sure therefore that the book before us, which is founded on a practical experience of as wide a nature as can have fallen to the lot of any one man, will be welcome, the more so as he has brought to the accomplishment of his task no mean amount of literary skill, producing at once a readable and well-digested book and a useful technical guide to architects and others upon whom may devolve the duty of protecting public and other buildings from injury by lightning. Mr. Anderson has not given us any hypothesis of his own as to the nature of lightning, but has judiciously consulted the works of the best authorities, and has furnished us with a readable history of the lightning-conductor, and probably a correct description of the nature of the effects it is intended to prevent. The practical part of the work is, however, the more valuable portion, as it supplies non-technical readers with information that many have desired to obtain. It commences with Chapter V., on Metals as Conductors of Electricity, in which the author has, rather uncharitably, exposed the liability of the most distinguished scientists to make serious errors. In the chapter on the Character of Lightning and Thunderstorms allusion is made to the statement that Solomon overlaid the Temple within and without with pure gold, and thus, unwittingly perhaps, took the best possible means of preserving the edifice from injury by lightning. According to Josephus, Solomon ordered the whole roof to be ornamented with sharply-pointed and thickly-gilded lancets of iron, presumably to prevent birds settling there and soiling the roof. That these points played an important part in protecting the building there can be little doubt, for all experience has indicated the use of points and large surfaces of metal in the attempt to protect buildings from lightning. The chapter on Inquiries into Lightning Protection is a useful, though necessarily brief, account of experiments and reports hitherto made with the view of obtaining some definite data upon which to work, and that is followed by a chapter recounting the experiments of Sir W. S. Harris. It is not impossible that more has been learnt from the failures of conductors than from a study of the theory of lightning, and there can be little doubt that copper is, all things considered, the best material for conductors. Chapter X. describes what has been done at the Hotel de Ville. Brussels, and at Westminster Palace, the former building being probably the best-protected of any in the world. It is covered on a plan devised by Professor Melsens, consisting of a perfect network of metal with numerous points, and ample and perfect earth contacts. The description of the measures taken to protect these buildings will serve to show what is considered good practice, and the practical details under the head of weathercocks, and descriptive of practice in France and America, will help to make the subject clear. The chapter devoted to an explanation of Newall's system is, however, an epitome of the whole subject, and as numerous examples are given, the reader perceives clearly what is required for a barn, a house, a factory chimney, or a church steeple. The system advocated by Melsens, of many small rods, instead of one large one, is adopted by Mr. Anderson, but it is tolerably well understood nowadays that advantage should be taken of the presence of any considerable piece of metal in a building to bring it into the circuit of the conductor. Thus a church, for instance, instead of ridge tiles, should preferably have a ridge of iron, which could be connected to the conductor, and so save the expense of running a copper rope from end to end. Several illustrations of the arrangement best adapted to special cases are given by the author, who also gives particulars of such minor details as fastenings, which should preferably be copper clamps built into the wall, in the case of a chimney for instance, though simple staples nailed to the wall will do very well in the case of the smaller and lighter conductors employed on houses. Not the least interesting portion of the book are the illustrations of the effects of lightning as seen in the case of churches and other buildings that have been injured by lightning, an engraving of the monument to General Baird, on the summit of Tomachaistle, near Crieff, serving as a frontispiece, and an excellent example of the disruptive power of a lightning stroke. The "earth connection," very appropriately, has a whole chapter to its consideration, and there are several engravings showing the most approved methods of insuring that at all times the earth wires shall be capable of distributing the discharge. A chapter urging the necessity for frequent inspection and testing of all lightning conductors, brings the work to a close—a very full bibliography forming an appropriate appendix. The book is well printed on good paper, and will, no doubt, become the standard textbook for use by those who are engaged in erecting lightning-conductors.

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* Lightning-conductors: their History, Nature, and Mode of Application. By Richard Anderson, M.S.T.E. London: E. and F. N. Spon.

ARCHITECTURAL ASSOCIATION.

THE ordinary fortnightly meeting of this Association was held on Friday evening, in the Western Gallery of 9, Conduit-street, W., the President, Mr. S. Flint Clarkson, in the chair. The following gentlemen were elected to membership:—L. Charles Dunch, Herbert Hootton, H. Paul Hogg, William Toogood, F. W. St. Aubyn, H. W. Moxon, J. Coates Carter, F. Clemence, E. J. Andrew, Martin W. Maylard, W. Neville Ashbee, R. Dalby Reeve, Leopold Barton, J. Crocker, G. Gates Warren, H. Lambert, G. Scott Stephenson, H. W. Crickmay, F. G. Hooper, A. E. Newth, W. A. Pite, R. Beresford Pite, E. Hodges, H. W. K. Martin, T. J. Holland, G. W. Jones, Rede Turner, H. B. Price, G. P. C. Fyfe, H. T. Clark, and A. E. Westover. Thirty-seven nominations for membership were read.

THE CONVERSAZIONE.

Mr. R. C. Page, hon. sec., proposed a series of votes of thanks to those who aided in the success of the recent conversazione—viz., to the Council of the Royal Institute of British Architects for lending their rooms, to the exhibitors of drawings, &c., and to the entertainment sub-committee.

Mr. Hugh Stannus suggested that in the list should have been also found the names of Mr. Boyd, who kindly, at a late moment, lent the museum of practical appliances, and to the Secretary of the Institute, who, after he had been properly and humbly approached, was almost gracious.

The President remarked that Mr. White was one of their members, and therefore would ever gladly assist, but added the names to the motion, which was agreed to.

SUCCESSES AT THE ROYAL ACADEMY.

The President said they had with some gratification seen that three of the Royal Academy Architectural prizes had been awarded to members of the Association, namely, the Gold Medal for a baptistery to Mr. F. T. Baggallay, a medal of merit in the same competition to Mr. J. H. Ince, and the Travelling Studentship for a design for town house of a royal prince to Mr. R. W. Gibson. The last-named set of drawings were exhibited in the room, the others were at present in the hands of the illustrators of the professional journals.

DONATIONS TO THE LIBRARY.

Mr. H. W. Pratt, the newly-appointed librarian, announced that Mr. George Godwin had, in accordance with promise, presented them with 38 volumes and a few pamphlets on architectural subjects. Thanks were accorded to Mr. Godwin, and also to Messrs. E. Nash, J. Ebbetts, Mark H. Judge, B. A. Paice, and Buckler for other donations to the library.

COMMON-SENSE IN ARCHITECTURE.

Mr. Cole A. Adams read the following paper under this title:—

Mr. Fergusson, in the admirable introduction to his "History of Architecture," says, "Convenience is the first thing which the practical common-sense of the Aryan seeks, and to gain what he desires by the readiest and the easiest means." From this ancient Aryan stock John Bull claims descent, and common-sense is a very strong article of his creed.

When and wherever architecture has been practised as a living art, as the outcome of the wants of the people who practise it, especially in those styles and ages which are generally reckoned by the educated as the purest, this quality of common-sense is everywhere recognised, as their works are eminently practical and logical. From the rock-hewn cave and rude hut to the stateliest edifice, this principle will be found to exist, and though a common-sense building may have no artistic beauty, a building which sets common-sense at nought will fail to please the intelligent observer.

Of the æsthetics of architecture I do not propose to treat this evening (except so far as may be necessary to illustrate my meaning), but rather of the practical side and of modern terms, as it is difficult in the short time at our disposal to take a very wide range of the subject; but I shall endeavour by illustration and example to point out the necessity of common-sense in architecture, and to show that where it is ignored or wilfully omitted, that building cannot fulfil the conditions of art.

Common-sense is a gift which is not implanted in the breast of every man, and where it is it must, like every other talent, be cultivated, so that it may gain strength by experience. But the man who adopts any profession or trade is expected by those who employ him to exercise this quality, to cultivate it, and bring it to bear upon the work he supplies; and this, more especially, in a profession where those habits known as business ones form a large part. In our calling it is essential, in the interest of our clients and the nature of our business, that we should, therefore, strive to conduct it on common-sense principles, for any departure from this will lose us respect and influence in the minds of our employers, the mischief arising from which will extend beyond ourselves, and weaken that respect which we should strive to hold in the eyes of the people.

The charge often brought against us as a body is this want of common-sense, that we are not practical, and many find a peculiar pleasure in pressing this accusation. Every blunder committed and brought to light in building must be laid at some door, and our accusers are happy if that door has the name of an architect upon it. Charges of ignorance in sanitation, which at the present time is exciting as a science so much attention, are hurled at us broadcast; and this is done by people who, if *they* exercised the common-sense maxim of looking before they leaped, would hesitate, and first ascertain whether an architect had been employed at all on the work which they condemn, and bear in mind that a very large amount of building is carried out quite independent of our services—that by far the larger number of us are lodged in houses provided by the speculative builder, whom it is not incumbent upon me to defend. He is a most useful man to the public, is created and supported by it, provides wares to suit all pockets, and it is at least a little unfair to charge him with the faults inherent in the article which the speculative somehow contrives to sell the public for a sum absurdly below what such an article would cost were it made of true metal.

Further, where this charge of want of common sense is brought against us, the question will arise, What is common-sense? You think so and so, and I differ from you. On the whole, considering that I make a study of my work, I ought to know best. Such questions as this must and do arise, and it would be impossible to lay down definite rules, and say this work possesses, and this other does not possess, common-sense.

It is easy, of course, to quote gross instances where this quality under discussion does not exist. For instance, in a house built without a staircase, a living-room without a window, a house built without proper foundations, or in the midst of a swamp, and expected to be dry, when no provision has been made to guard against the situation, and so on. Here, perhaps, we should all agree that no defence could be made, and we have no hesitation in saying that the persons responsible for this lack common-sense.

Let us also take other examples, which require a higher perception of this faculty than those just quoted. We have in the present day a rich store of illustrations of the architecture of past ages, and I think you will take it for granted that the building generally tells you the purpose for which it was erected, if you are familiar with its style; and we all agree that a work should express this common-sense requirement. But often in modern times we find that this is ignored. In the Gothic revival, a movement which has been so beneficial to us as a nation, it is not to be wondered at that enthusiasm carried many of its disciples beyond the region of common-sense, and blunders were made which we must deplore. In the rage to build everything Gothic, the world containing the relics of the past has been ransacked, and the treasures gleaned have often been misapplied. Let us take an ordinary dwelling-house for instance. It is not unusual to find the porch looking as if it had been brought from some village church, and though it fulfils its practical common-sense purpose, it does not commend itself to common-sense intelligence, which demands fitness and expression of the use for which the work is intended. Neither are we impressed, on entering a small hall or dining-room, to find a chimney-corner recess large enough for a spacious apartment, and there apptiate enough, but out of scale altogether where spaciousness could not be obtained. Common-sense seems to demand that the fireplace should be apportioned to the scale of the room. Attempts, too, have often been made to plan houses on Mediæval lines, ignoring the fact that the world has grown older and more civilised, and demands refinement of plan and requirements to be met which must arise as the necessity of existence. Instances might be found where the dining-room has been so placed that it had to be traversed by any person requiring access to the stairs or kitchen, and this not from want of skill, but from a desire on the part of the architect to reproduce the simplicity of living as it existed in the past. As well may we try to persuade people to go back to the inconvenience of the old stage-coach and the slow delivery of letters. Yet many of you must know that attempts almost as unreasonable and lacking common-sense have been made by many men who, instead of seizing the spirit of the past, and designing in it, seek to reproduce the letter, and are imitators only. Again, we sometimes see a church-like gable and traceried window engrafted upon a house in the part occupied by the staircase, and looking more like a private chapel. The whole does not express its purpose. Both gable and window were right where they originally came from, but, transplanted, the incongruity is apparent to intelligent criticism. The butler carrying the dinner up this staircase in monk's garb would be thought quite out of place, and yet would it be much more incongruous?

Church restoration and building both offer much food for reflection, as the most prominent result of the revival of the art. The difficulty of building houses successfully in the Gothic style has always forced itself upon the attention of the designer. Our mode of living is so out of joint with it, that it promises soon to go out of fashion for civil domestic purposes; but for ecclesiastical buildings it will probably survive, though even here there are signs of reaction. Now, as to restoration. Churches are built for the common-sense purpose of affording shelter for the people who worship in them: their highest functions are dependent upon this. The use to which our churches are put will vary according to the requirements of those who use them. Our days witness a return in a large party of the Church to more ceremonial observance. Previous generations had in their day ignored ceremonial, and at the Reformation had cleared the churches of all that, to their minds and teaching, symbolised the faith of their fathers. With the enthusiasm of the time a clean sweep was made of everything that served to recall the hated doctrines, and, from their point of view, it was a common-sense proceeding. These things represented to their eyes error and false teaching. Away with them! We know what followed. Whitewash, ceilings plastered up, churchwarden additions, pews, galleries, three-deckers. Then came the revival in church principles, and the demand for buildings which should act their part in teaching these, and men set themselves busily to work to restore and build churches to this end, and the example has been followed even by those who still adhered more strictly to the spirit of the Reformation. The religious aspect of this question is obviously only touched upon here to illustrate the reason for this change. If, as we have seen, the reformers looked upon the building and its furniture as of no importance in teaching doctrines, the revivers of ceremonial in our day insist upon the building and furniture fulfilling this purpose, and so making use of the senses by external teaching. This being so, it is obvious that our churches, as they were some half-century ago, were a standing protest to the new school of divines. They demanded that, for the proper and reverent conducting of the services, all those fittings and additions which we know as churchwarden, should in their turn be swept away. As men's attention was called to our churches, the beauty of them became a popular study, and we all know how the enthusiasm spread, and what it has produced. This revival in the Church demanded, as we see, a return to the teaching of art as part of its system, and though its advocates do not insist upon it as a necessity of their creed, they welcome its use, as soldiers do the colours under which they serve. From this point of view, I think it may be granted as a perfectly common-sense way of effecting their end. In the zeal with which the restoration of our old buildings has been carried on, much irreparable mischief has resulted. It is a natural consequence that it was so, for experience must be bought. What we have to look to is to buy it at the lowest rate possible. Seized with alarm at the blunders that have been made, many have rushed to the opposite extreme, and would stay the hand of the restorer altogether. These worthy people, actuated by honest motives, would leave the buildings as they are, or only do what was absolutely necessary to prevent their decay, by keeping out wind and weather. As archæologists and students, it is impossible to withhold sympathy from such intentions. With what delight do we enter a church where we find the whitewash and grey hairs of age. Here there is no mistake likely to arise as to what was part of the original building, and what is churchwarden. You would probably after a little study of it be prepared with a scheme for restoring the fabric; but you probably will miss a great deal of pleasure if, on paying a visit to it at another time, you find your old friend with its hair dyed, and made young again by some other restorer. But suppose the anti-restoration men had their own way. Decay we know is the mortal inheritance of all earthly things, and does not common-sense experience teach us that there is a limit to patching and propping: that circumstances often arise, over which we have no control, which necessitate radical alterations; that uses for our buildings arise from time to time, to which uses we must bend them, or else leave them to decay. Leave them, say some. Build others for what you need, but touch not with altering hand these stone books of the past. But, says Common-sense, these buildings were erected for the purposes of worship, and men in previous years adapted them to their needs. This dedication to their high purpose is the most important, and therefore, as long as they afford shelter and can be made use of, men will avail themselves of them. Your interest in them is altogether secondary to this. Is it not impossible to lay down definite rules of what shall and shall not be done? Common-sense must be employed, and, further, we may say that, in dealing with such treasures as are bequeathed to us, that here, more especially, only those well skilled in the work to be restored should be employed; and it is a pity that we have not some central authority to restrain such work from falling into the hands of men who, from want of sympathy, and ignorance of what they undertake, do an amount of mischief which is beyond recall.

In the building of new churches, common-sense requirements are too frequently overlooked. Here, as in other things, men forget that the world has moved on since the time that it produced the works that we admire, and that the more artificial life we lead now requires that more attention should be paid to the comfort of the people who are compelled to worship in cold and draughty churches. Because great simplicity in all such matters is found in the old churches, that, surely, is no sound argument for not seeking improvement in new ones. Now it is only common-sense to know that if you have only one door into a building, and the weather is cold, that the chilled air will enter by it, and make those people miserable who are in contact with the draught occasioned. Architects seldom dream of doing this in any other building where people assemble. We all know that in a house, where the money to be spent will allow, screen-doors are put to a hall; and in most cases some sort of a passage cuts off access from an external door and a room-door. Why, then, should a congregation be exposed to danger, for real danger it often proves to be, by omitting so simple an expedient as a lobby of some kind. Contrast the comfort of a church or chapel where this is done with one unprotected from the blast.

Another serious omission is the absence of any mechanical and simple contrivance for admitting fresh air from outside and warming it before it enters the building; for in winter--and the one we are having now calls our attention to the fact—it is misery to sit in a building with the windows open. So a close and stuffy atmosphere has to be breathed, no means existing to get rid of it, and to supply fresh air in its place. I allude, of course, to funds permitting.

Other great causes there are which militate against warming our churches—the large amount of glass and the open roofs, both great chilling surfaces. Moreover, sometimes the boarding to the roof is not tongued, so that the hot air finds a ready escape, and so the heating apparatus is comparatively useless.

Common-sense in planning is often sacrificed to supposed architectural effect, and whereas seeing and hearing are the most important points to be met for the comfort of a congregation, especially where the means at disposal are limited, some sacrifices to effect may readily be granted where the circumstances permit. But where this is not the case, it is assuredly foolish to so seat the congregation that their view and light are interfered with by facing walls and other obstructions. These are difficulties that arise, and to ignore them for the sake of carrying out some likeness to what we have seen elsewhere, and for which probably sound reasons might be advanced, is a confession of weakness, and to this error may be attributed much of the lifeless work we have in our midst.

What a perfect medley do some designs present!—here part of a monastery, here a church; details reduced so in size from what they were taken, as to look starved and wretched; chimneys overtopped by high roofs that will be sure to make them smoke; buttresses to resist no thrust; windows stuck in for appearance, coming anyhow in the rooms, now close to the floor, now above looking-out level; roofs that must from their construction thrust out the walls; passages ill-lighted, and tortuous in their windings—these and other mistakes arise from ignoring the common-sense requirements of the purposes for which the building is intended, and with the mistaken idea of producing architectural effects by trusting to appearances only. Careful consideration of the plan and working out heights and sections of the construction would have shown the designer his mistakes; and a more intelligent studying of the works which fill his sketch-book, that what looks well and suitable in a position for which skill has designed it, may become ludicrous if placed in a position which is foreign to its original purpose.

I cannot leave this part of my subject without a brief allusion to the style which has somewhat quenched our Gothic ardour, and which, for want of a better name, is called "Queen Anne." I believe I am right in saying that its sponsors promised in its name essentially common-sense qualities, and that it would more readily adapt itself for house architecture and modern wants. In my own opinion, I think there is much in it to commend itself as a style, but it is possibly only the prelude to a revival of Classic architecture. Here, as in the Gothic revival, men are and will be found hunting up old examples, and trying to make new houses look as much like old ones as possible; and as long as imitations are the fashion no real progress is possible. Touching "Queen Anne," common-sense may ask, Why is it necessary to return to small panes of glass and thick bars which obstruct view, when you can get larger? Would the old builders have put them if they had not been obliged? Why is it that porches are built and cut off short of the cornice—looking as if you had not bricks to finish with—to get light into the hall? But surely you can do this without resorting to so foolish a refuge. And why, in this dirty London climate of ours, do you paint your outside doors white or pale dull greens? After the first week's use they are dirty and disagreeable to look at. And while on the subject of painting, a great deal has been said against graining and varnishing; it is decried as a sham. But if you will soothe your conscience by calling it a conventional mode of decorating doors, &c., you will have a most useful agent. Beyond all question, for ordinary purposes, there is nothing that on the whole wears better, looks better, and goes better with the ordinary furniture and belongings of a house—a thoroughly common-sense method. But, to resume, why is it necessary to stick up tablets on blank walls, in all manner of positions, looking as if they had been bought up from a church under restoration, and set up here as a protest against the vandalism that removed such precious works of art? Why, too, we may ask, is it necessary to be putting balconies, balusters, and railings where they are not wanted at all? And other questions of this kind will be forced upon you, if you will take a walk in the neighbourhood of the Thames Embankment, or some of our new streets, and study the designs which are weekly supplied to us.

Much of the charm of the red brick style consists in its colour, and there is no doubt that it has great capabilities when used with skill and sobriety. Too much of what we see is rendered feeble by the fussiness displayed and the ignorance shown in the mouldings, which are too often of a nondescript form.

I will, in conclusion, make a few remarks upon some of the causes which conduce to failure and violations of common-sense, hoping to fulfil the object of this paper by exciting discussion upon it. I believe that the main cause lies at the root of professional training. Lads are articled to an architect, and left in the offices too often to shift for themselves. You all know the usual course, so I need not stop to describe that; but I would urge the importance of reform—that it should be an understood thing in the articles of agreement that a pupil should spend a large part of his time upon works in progress, that he might see for himself what drawings mean when carried out, learn the different modes of construction—from foundations to painting—be compelled to make measured drawings from the work, accurately showing how the parts are put together, and to make himself familiar with the terms and methods used in building. Better still, that after his pupilage was up that he should, if practicable, be sent for a couple of years or so to a large builder, and there be taught the practical side entirely of the question, even to manual labour, and that perplexing study—a builder's account. Engineers do this, and their works are pre-eminent for common-sense. Why should not architects make themselves also familiar with the capabilities of the materials in which they will have to work? The knowledge thus gained, combined with the experience of the office, and careful and systematic studies from old examples, would produce men skilled, theoretically and practically, in their profession; and to those within reach the Architectural Association offers immense advantages.

That we, as a profession, should hit upon some feasible plan by which competitions might be conducted on a fair footing, is much to be desired, and I trust that when the subject comes up here for discussion some remedy will be found. If the Institute and yourselves were to combine to resist the injustices of the system, much might be done to discredit it. One thing we may assume as certain: the competition system exists, and is more or less popular. What is asked for, is fairness from projectors and among competitors themselves. The appointment of a skilled professional man as referee seems a necessity, for this very common reason: no layman is competent to decide upon designs and discriminate between rival merits. Then if competitors knew that their designs must undergo the scrutiny of plan, sections and details, better designs would be sent in, and the simple draughtsmen-architects would be nowhere. Too much stress has, I believe, of late years been laid upon this quality of draughtsmanship and sketching. Excellent as accomplishments, they are not the be-all and end-all here.

DISCUSSION.

The President remarked that they had had a very interesting paper, the title of which had raised a good deal of curiosity as to its meaning. In ordinary professional life they were apt to form a very peculiar impression of the signification of common-sense. Perhaps ignorance and good health, and a want of humour, and a general obtuseness on special subjects, was the analysis an architect would make when opposed by an outsider who wished to argue on common-sense grounds. Apparently, Mr. Adams proposed to himself to define common-sense as "choosing the best thing," and he had taken considerable pains to show what he considered as choosing the best thing. Of course, all were agreed that this was desirable in the abstract, in architecture as in all other matters; but the real point of difficulty was whether the things recommended by the lecturer were so desirable in themselves. He hoped for the sake of discussion a good many members would say they were not, and would propound other things which, in their turn, succeeding speakers would show were by no means to be chosen as the best, and so the matter would be thrashed out.

Mr. Gilbert Redgrave thought the true definition of common-sense in architecture was the old one between orthodoxy and heterodoxy—"Orthodoxy is my doxy and heterodoxy is everybody else's." My opinions are common-sense, and any other views are not sensible. The lecturer had shown many examples of want of common-sense, and had indicated his ideas of it as convenience in planning, in elevation, and in furnishing. He had been reminded, as he listened, of the amusing anecdote told by Horace Walpole, of the man who built unto himself a house with so good an elevation, but so badly arranged, that he found the only mode of deriving pleasure from it was to take a second house on the opposite side of the street, so that he could look at it. An instance occurred to him in which a man determined to have a real Mediæval great hall in the centre of his house; within it the family lived and had their meals. This hall was surrounded by the offices, and reached from the gallery were the bedrooms. All was picturesque; but in the morning, when the family were at breakfast, the only way to remove the slops was for the servants to dodge in and out of the rooms along this gallery. Common-sense in planning would have avoided this ludicrous drawback to enjoyment of the hall. Church-building was a topic that might very well be discussed under this title. In this department of architecture there was a higher sentiment involved, to which architects must sacrifice some of the more practical views which they had heard expressed by Mr. Adams that evening. Although there would exist differences of opinion as to what constituted common-sense in architecture, he was sure all would join in the vote of thanks which he was about to propose to Mr. Adams, for bringing the question before them.

Mr. J. Sulman, in seconding this vote of thanks, wished to take up a few of the points raised in the paper. They had all heard the strong advocacy of the sentiment expressed by Mr. Adams's title by the man who called himself "practical"; he was generally a good sort of fellow in his way, and useful to a certain point, but he only understood half the points which made up good architecture. But more common in the profession were men who were primarily artists; indeed, the tendency, as the author had suggested, was to put architecture first and common-sense second. What was wanted was neither of these extremes, neither a mere builder nor only a draughtsman, but a mean between the two, and this was most difficult of attainment in the same man. What they should ask themselves was whether it was possible to obtain in the profession a large proportion of "all-round men"? He had just returned from Lancashire, where he had been brought into contact with professional brethren who were good men of business and sensible workmen, but some of whom seemed sadly ignorant of art; and it was to be feared that many architects in London, while better informed artistically, neglected to develop to the utmost their skill in construction. It was desirable to consider whether they could not individually be equally well versed both in construction and in art. As to ecclesiastical architecture, he would like to point out that in Nonconformist work there was usually a far greater amount of common-sense displayed than in Church work. The architects in Church work were hampered by traditions: Nonconformists were in the blessed state of the man who has no grandfather, for they were absolutely free, and thus had a better chance of developing ideas of places of worship in which comfort should be combined with good architecture. As an instance of what he meant, he would refer to Union Chapel, Islington, where they saw the wants and tastes of the present day met, and a comparatively new mode of building carried out, in accordance with the dictates of common-sense. He wondered that church-designers did not devote more attention to details. The single door Mr. Adams had referred to was commonly suffered to exist by Church people, but would not be allowed in chapels. Then, as to the question of revivals in the present age, architects were doing nothing but revive old forms and styles. Were they to go on for ever reviving by turns Greek, Gothic, Queen Anne, and so back to Classic? No one would defend such a system of fashions on logical grounds. Why should they not take up the everyday-work, the very vernacular, and endeavour from that to practically improve upon it, without regard to styles? Such an endeavour would be better far than the clever adaptations so common. Whether such was possible—whether, in fact, the spirit of the age would be too strong for architects—could only be seen if they set themselves to the task. Of course, it would lead to failures, and even abortions, but the aim would justify and repay the trial. He had been utterly astonished to hear the author's defence of graining received with a measure of approval. Such a suggestion, if it had been made in that room five or six years ago, would have been hissed down. Graining was indeed an imitation, and that again was a revival. For himself, he confessed its advocacy went against the grain; let them have no imitations of natural wood in their painted work, and he certainly had not found it wear better than simple coats of colour. Reverting to his opening thought—that of professional training—there was no question that a young architect should first be taught to be a good sound constructor, and then given an artistic education. The question was, how was this sequence to be secured? The best way was for the pupil to spend some time in the workshop actually at work. He could speak from personal experience, during a period of ill-health, of the invaluable advantage such a course of training was to the young. architect. Mr. Adams had almost confined himself in his paper to examples of want of common-sense, and they had just now seen an extraordinary instance of this lack in Welbeck Abbey, perhaps the most conspicuous example of this that had ever existed.

Mr. W. G. Audsley, of Liverpool, supported the vote of thanks, saying that while he did not agree with all that had been laid down by Mr. Adams, he sympathised with at least two-thirds of his remarks. He fully concurred in the closing remarks of Mr. Sulman as to the lamentable want of common-sense at Welbeck.

Mr. Aston Webb feared that in architecture, at all events, common-sense was very uncommon. Indeed it was only attained, or at least its presence was only evidenced, by men of the greatest talent. In fact, common-sense was genius. Its exercise was as essential to the beauty of a building as to its practical utility. On the matter of tradition in Church architecture, raised by Mr. Sulman, he would confess that he considered it most fortunate that they had a tradition to guide them in ecclesiastical work. It gave weight to all who attempted to build. It had been suggested that happy was the man who had no grandfather; but a long family name was a good ballast to a man, and restraint, just as the history attaching to a regiment gave its humblest members an *esprit de corps*; this was essentially borne out by Church architecture. He could not see that Church architecture, however formal, was much inferior to what had as yet been carried out in chapels. (Mr. Sulman: I was not even hinting at such a suggestion.) As a matter of fact, it was not at all uncommon to see double doors provided in modern churches, and certainly the ecclesiastical notions on heating and ventilation were not confined to a hole in the roof and a stove at the west end of the building. Next, as to modern training. What education an architect's pupil should have was a moot point. In the schools the training now given was an improvement on the past, and the Association and other bodies were doing much to benefit the young student, but what he most needed was practical insight into actual work. The pupil should not only see the drawings, specifications, and correspondence of his office—and the latter would be of great subsequent assistance—he should also constantly go on to the works in progress, make friends with the foremen, put all the inquiries possible, and spend some time in the builders' workshops; and no architect worthy of the name would grudge him the time thus spent. He felt convinced that architects should not, as a rule, throw it in each other's faces that common-sense was not practised by the majority of the professed. It was clear that more attention to details was displayed than formerly was the case, and that great improvement in building had been shown during the last few years. They had all seen the drawing of a clergyman's house, which was shown in a professional paper a few weeks ago—a house designed by a gentleman of distinction, well known for the possession of common-sense—a gentleman who had instructed the profession in their duties (laughter and applause), but, as it was pointed out in following issues of the professional paper, who had not displayed in the house the skill and common-sense which might have been expected from him. The publication and the discussion raised upon it had shown that not only attention to architectural propriety, but a course of long training, was necessary to the carrying out of practical work.

Mr. W. Hilton Nash said Mr. Adams had endeavoured to add to the five senses usually regarded as necessary, a sixth, that of common sense. He gave an amusing blackboard illustration of a want of this displayed by an architect who, in order to be original, tied a roof by connecting the supplying beams beneath the floor, the result being an alarming weakness at the knees of the roof, which necessitated a return to the customary mode of tying-in. Mr. Webb had alluded to a recent work designed by a gentleman who had written, for the benefit of the profession a Book on Building. If any one needed another example of absence of common sense in planning let them look at one of the house-plans given in that book, and contemplate the arrangement of the staircase for a little while. But this lack of common sense was largely shown in London, in the great diversity of buildings. If they went to a sister capital they would see a much greater unity of type in house architecture, whether resulting from the higher training in schools or from a better supervision he would not consider. He was inclined to the opinion that common sense did not increase with the enlightenment of a people. For instance, no one would consider the Normans well educated, yet in their buildings they exhibited much more of the quality of common sense than was apparent at the present day.

Mr. H. H. Stannus would take up a remark of Mr. Adams's about the present Queen Anne style being evidently a half-way house towards a Classic revival. So it was; but if the Classic man had been in the ascendant of recent years, and this style or that form of it practised on the banks of the Loire had been introduced by the younger men, it would have been apparent that it was equally a half-way house towards Gothic. What, another speaker had asked, was to be the issue of all these revivals which marked the present age? The spirit of the times was essentially analytic—questioning and reasoning; a determination existed to put all things to the trial. The best points would, he confidently believed, be selected and retained to form the style of the future, and, whatever the event, there would be a "survival of the fittest." He quite agreed with one of the speakers, that young architects were too much in the habit of bringing home from their tours "jolly little bits," which they endeavoured to fit, like mosaics, into their buildings. True, the old builders did this, but, adopting an epigram of Bishop Temple's, we should do, not *what* the old men did, but *as* they did. Mr. Nash had eulogised the work of the Normans, who were certainly not enlightened, but he forgot that amongst the Normans there was but one style, and, of course, only one thought, and not so much difficulty in keeping correct. In the present day there was development, and so freedom of thought, and, consequently, much diversity. What was wanted, and what Mr. Adams had advocated, was reasonableness in architecture. A great aid to a young architect in attaining this practical common-sense in building was to be able to go to a comrade who would act as *advocatus diaboli* towards his design, would question the needs and reason of every little point, and so lead him to think out a desirable mode of building. They had some years since heard in that room from a gentleman who had worked under the late Viollet-le-Duc, that that great architect would question his assistant and make him show a reason for the faith that was in him, and so force him to design his thoughts. There was much talk about the education of the architect, but he believed if there was any deficiency in training, the fault was in the student himself. If a man wanted to become an architect and to practise his business with credit, nothing could prevent him from doing so, but no provision of facilities could make a man work. It was not what a man was taught, but what he learned, that benefited him, and it was yet another illustration of the survival of the fittest, that it was only the man who sought opportunities for self-improvement who was worth his salt.

The vote of thanks having been put from the chair and heartily adopted,

Mr. Adams briefly responded. Common-sense was, he remarked, one of those things about which every one conceived a different definition, and he was personally obliged for the many definitions that had been called forth by his paper. He heartily concurred in the suggestion to submit a design, if possible, to a friend who would candidly criticise it, and point out the weak points. In fact, he had practically adopted that plan with reference to the paper he had read. He had, indeed, written a paper which would have extended over forty minutes in the delivery. He took it to a friend who, after looking it over, said, "Very good, but too long, too slangy; cut it down to twenty minutes." He therefore put the manuscript on one side, and again essayed, and the kind recognition which they had accorded to this second attempt had well repaid the endeavour.

The President announced that the next meeting of the Association would be held on January 2nd, when Mr. R. L. Cox would deliver a lecture upon "Architectural Illustrations and their Classification."

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THE opening meeting for the present session of this Society was, as we briefly announced in our last issue, held on Thursday in last week, at the rooms of the Iron and Steel Institute, 7, Westminster Chambers. The President-elect, Mr. William Charles Street, occupied the chair, and there was a fair attendance of members. Mr. C. H. Driver, F.R.I.B.A., retiring President, proposed a vote of thanks to the late secretary, Mr. Edward Speed, for the zealous manner in which he had discharged his duties, and introduced to the meeting his successor in the office, Mr. F. Wheeler, A.R.I.B.A. The President then delivered the following

INAUGURAL ADDRESS.

Gentlemen,—When you elected me your president I felt great diffidence in accepting the post, for, though I am proud to possess your confidence, the responsibilities connected with such a position, in what may, without doubt, be called troublous times, are very great, and I considered that it needed at the present moment some one of greater importance, and possessed of greater powers and with more leisure than is at my command to satisfactorily fill this chair during the coming year. It is easy when everything is prosperous, members numerous, and papers plentiful, to assist in the work of a successful session; but after some years of comparative stagnation, when members have fallen off, and it is difficult to procure papers, the demands upon the time and attention of your president for the time being are more onerous. I have, however, to thank those members who have so kindly come forward and promised us papers during the coming session, and when we look at the list we have every assurance that attendance at these meetings will be of great profit to us, and will further the objects for which we are joined together in this Society. Among the subjects enumerated there must be some which must touch upon the practice or nearly concern every member of the Society, and I trust we shall all make a note of the subjects, and the several dates fixed, and come to the meetings each prepared to render his assistance in the discussions by affording any relative information in his possession. By so doing not only will a numerous attendance be insured—a matter affording great encouragement to the readers of papers before the Society—but the collective facts and information elicited in a good discussion will be a great and general benefit to all of us.

The use of a presidential address, besides being a genial way of inducting to office the person who is to take the chair at our meetings, should be to indicate what in his opinion is the immediate future of the profession, and toward what subjects or ends those who are comparatively commencing the battle would most advantageously address themselves. I remember to have been told on a similar occasion in another place how many hundred miles of railway had been made, together with a dismal quantity of statistics of that character; but I am afraid that would now be very much like trying to get good out of the glass after the wine has been exhausted. The introduction of the railway system suddenly created for engineers an immense quantity of work, and a tide of prosperity set in which, notwithstanding many alternations, was felt up to within a few years since. The completion for the present of all reasonable wants of locomotion, and the intervention of a long period of stagnation, due to over-production in all branches of our manufactures, as well as to the effects of the extraordinary demands of labour, in recent years, has comparatively checked any further development of the railway system. Until the results of the evil influences referred to have passed away, and there has been a revival of trade, there cannot be any natural demand for additional means of intercommunication, or the construction of branch lines or tramways, and we must therefore not expect much of that class of work for some time to come. The probable introduction of steam for tramway purposes may give a slight impulse, but the difference between tramways and railways will then be so slight that the chief distinction will be in the name. I had expected that before this the fireless locomotive referred to by Mr. Driver in his address at the opening of last Session, would have been put upon its trial on some of our English tramways. It appears to me to be one of the most likely solutions of the problem of adapting steam for use on common roads; but those of us who have ever endeavoured to introduce any improvement have been made only too well acquainted with the eminent conservatism of our leading railway and tramway engineers. It is doubtless a great virtue, but carried to excess, it may possibly become a vice.

With regard to railways it is, however, true that in regard to brakes there has been much improvement of late years, and though the subject remains pretty much where it did twelve months since, the provision of sufficient brake power to passenger trains is being extended generally and to the public benefit. On several occasions when dangerous accidents would otherwise have happened, trains have been brought up safely within short distances, and impending danger has been averted. The competition between the different systems is being gradually lessened to the Vacuum, the Compressed Air, and the Chain Brake, and each is doing good service. I much prefer the Vacuum brake myself on account of its ingenuity, simplicity, and safety; but advocates of the other systems can doubtless advance good reasons for their preference. What is wanted is perfect liberty to each railway company to adopt whichever brake they consider best adapted for their service, and thereby provide an incentive for invention, by which alone great improvements are ever effected. And each company is deeply interested in the safe conduct of its traffic, a serious accident affecting dividends as acutely as depressed traffic, especially if the company is considered to have been culpably negligent in the provision of sufficient brake power or any other means of safety; for juries, in awarding damages, are very materially influenced if they are led to believe an accident might have been avoided if there had been sufficient care in the conduct of the traffic by the company.

I trust the day may be far distant when there shall be a Government acquisition of railways in this country. We have had experience of the results derived from such proceedings in the case of electric telegraphs. Every incentive to free invention and action appears to have been stopped, and all recent improvements are from those countries where there is greater freedom and chance of appreciation.

I should have been glad if among the papers on our list, there had been one on the future government or conservancy of our rivers, and the different catchment areas. The past summer, with its continuous rains and the prevalence of floods in many of the lowlands of this country, has forcibly impressed upon the minds of many of the proprietors of such lands the necessity of taking some action in the direction recommended in the report made two years since by the Committee of the House of Lords on Conservancy Boards. The condition of our rivers has not improved of late years. The extensive drainage improvements which have been effected in the agricultural districts causes the water to flow off the land into the rivers with far greater rapidity, and a storm which would formerly have taken several days to pass away by the outfall is delivered there now sometimes within twenty-four hours, causing for the shorter time a proportionate increase in the volume of water. In addition to this the streams have in many places been poisoned and choked by the refuse products from our manufactories and our sewers. The capacity of the watercourses, therefore, instead of being equal to the increased volume, has been so diminished that they would not properly be sufficient for that which they formerly had to discharge. The damage done to property and crops by the floods so occasioned has been enormous, while the health of both man and beast in such districts is often affected for long after the waters have passed away.

The great difficulty experienced in dealing with matters of such magnitude are the numerous conflicting interests which have to be encountered, and the existence of several distinct authorities for the course of a single river.

The Committee referred to have recommended that in order to secure uniformity and completeness of action in dealing with each river, each catchment area should, as a general rule, be placed under the control of a single body of conservators, who should be responsible for maintaining the river from its source to its outfall in an efficient state. The tributary streams might be intrusted to district committees under the conservators, but near the point of junction with the main stream they should be under the direct management of the conservators, who should be a representative body constituted of residents and owners of property within the whole area of the watershed. The jurisdiction of the Conservancy Board should include the power of removing obstructions, improving outfalls, and of deepening and dredging the bed of rivers, and powers of dealing with river banks and bridges, and of compulsorily acquiring land at a fair compensatory value. It is also recommended that duly limited powers of rating should be conferred on the Conservators.

It is proposed that it shall be left to each district to be the judge of the necessity of the case, and that requisition shall be made by those resident or possessing property within it, when they think it desirable, to Government for the foundation of its Conservancy Board, and that due notices should be given. Of course, very many districts will refuse to see the need of such Boards, or will procrastinate as much as possible on the score of expense; but for all this, so urgent is the need that if the recommendations of the Committee pass into law I am sure that much will be done in the direction pointed out. From schedules appended to the report there would appear to be about two hundred such Conservancy Boards suggested, having jurisdictions varying in extent from 10 square miles to 5,000 square miles. Each of these Boards would necessarily require a professional adviser, for the highest authorities agree that each watershed must be considered individually, and that no fixed rules can be applied to them all. There are those who would prefer a central government for the whole, and who would be ready to apply a similar treatment to every case. One gentleman appears to have advocated embankments as the one remedy to be applied for the cure of all evils connected with floods. I would beg to differ from him almost entirely, and assert that it is generally begging the question when you have to resort to embankments for such purposes. The formation and proper maintenance of embankments in lowland districts, where the surface level is below high-water mark, is of course an imperative necessity; but in the majority of cases the watercourses should be cleared, deepened, and enlarged in such manners as to make them adequate for the discharge of flood waters; otherwise you will often raise most prejudicially the general water-level of a district, and you may go on increasing and increasing till the evil created shall be as bad or even worse than that which it was intended should be remedied. A careful and intelligent study of each particular case will be necessary, and the work should, if possible, be intrusted to such persons as have the best acquaintance with the particular district under consideration, or of similar districts. In the present age of intercommunication and interchange of thought, the officer for each district will become readily acquainted with what is being done elsewhere, and will have every facility for ascertaining whether such works or treatment would be beneficial in the particular instance upon which he is called to advise.

While the provision of outfalls of sufficient capacity for each catchment area is a most important work with regard to meeting the exigencies of floods, the storage of pure water in suitable upland valleys for providing a sufficient supply for drinking, manufacturing, and irrigation purposes in seasons of great drought, is almost, if not quite, as important an object, and the works which will probably be intrusted to the engineers of the several conservancies are likely to be numerous and most important.

Before leaving this subject, I would, incidentally, draw attention to the great increase in late years in the growth and spread of the so-called American grass or ditch-weed. This rank plant, however introduced, has now got a firm hold in many districts, and nearly chokes the watercourses where the stream is sluggish. I have noticed this in several places, and know that it is causing the local engineers much anxiety. An antidote, or means of exterminating it, has yet to be found.

Working in a similar direction as the proposed Conservancy Boards for the public welfare are the several Local Boards of Health, to whom are intrusted the water-supply and drainage of some of the most important towns and villages. Without wishing unduly to disparage the collective wisdom of those elected by their neighbours for the management of interests of such vital importance to the community as water-supply and drainage, I must be allowed to remark that it is not always the best that is arrived at by the means of popular election. Those who are thus elected are often the best-known tradesmen in the town, or those who make an outcry about what is called unnecessary expense, and who pledge themselves to their poorer and more ignorant neighbours to cut down all expenditures and lessen the rates. Their fitness as judges of what is really necessary for the health of their fellow-beings would often appear to be a quite unnecessary, or, at any rate, a secondary qualification. Even among educated people it is often hopeless to attempt to instruct them even in the elements of drainage and ventilation, or water-supply. They will often listen more or less impatiently to what you have to say; but directly you proceed to do what is necessary, they view you with suspicion, and attribute everything of whatever kind that arises amiss to you and your new-fangled notions or appliances, impetuously check their action, and utterly destroy every chance of efficiency. How much worse chance have we when the intelligences we have to appeal to are often those which are seldom exercised beyond the needs of the four walls of their shops! Boards so constituted can hardly be considered fit judges of plans and specifications submitted in competition for the various works which are often insisted upon by the Imperial Government in consequence of local outbreaks of epidemics due to the neglect of anything like sanitary measures in districts where each selfish individual has been allowed to do what is right in his own eyes without regard to the lives and welfare of his own family and neighbours. The first thing looked at in such cases is the amount of the several estimates, and if any of the competitors have fairly entered into and studied the matter and made due provision for all that is really necessary for efficiency, their chance is small, for if they have been careful in their work and accurate in their estimates their amount will almost of a certainty place them out of court. It is the scheme that has been superficially but showily prepared, and much under-estimated, that will be preferred. We all know that in the long run the district has to pay the penalty for trying to compass a necessary work with insufficient means; much of what is done will have to be undone, and the works have ultimately to be carried out to the full extent at a much increased cost. This might be avoided if in such competitions the boards would permit themselves to be advised in the selection of the plans by some independent engineer or authority upon the subject. This is avoided because they consider themselves practical men, and wish to avoid the expense of a fee which would be recouped them tenfold. Again, they know, with unerring instinct, that anything like thorough work, such as they would probably be advised to put in execution, would be repugnant to them, and be a breach of the pledges they gave for the votes which secured their election.

In spite of difficulties such as these, much has been effected, and much more will yet be done toward the improvement of the conditions under which we exist in this country. That much more remains to be done will not be denied for one moment by those who have examined or thought about the question of efficient sewerage. Such of us as live in London need only look at home; we have removed from our midst a great and sensible evil, but we have only passed it on a few miles down the silent highway, whence it will again assuredly confront us with increased dimensions. I know that some of our members have very strong opinions as to the systems they individually advocate, and I would be sorry to dogmatise on the subject, but putting sewage into a navigable river is certainly what Lord Palmerston would call matter in the wrong place. I can personally testify to the quantity and quality of the filth in solution and deposited in the lower reaches of the Thames, and that it must become a gigantic nuisance is an impending probability. Without pretending to give sewage the manurial value accorded it by some authorities, I am certain that if it were matter properly treated and put in the right place, the wealth of the nation would be sensibly increased.

In efforts made towards the solution of any difficult problem there must be many a failure; and I would, with all reverence to mighty men now passed away, say that many of the most beneficial improvements in the world seem to have been arrived at by a process of stumbling forward, even though the stumbling has been by giants. I have often looked with amazement at some of the wonderful machinery now employed in our manufactures, and though it is true that a mind might be created who could plan and carry out such marvellously wise and intricate arrangements, I think the consideration or even realisation of such a heaven-born genius would be beyond the powers granted to most of us.

If, therefore, in the process of perfecting any system for dealing with the sewage question there should be many failures, we must not be dismayed, or think it an impracticable one, or one to be avoided by sending it seaward until it again makes itself heard, and with greater exigency. If, now, fairly met and struggled with until it is conquered, those engaged in that contest will be enrolled for ever among the great benefactors of the human race.

Leaving the less odorous portions of the Thames, I will come nearer home, and on my journey up the river notice the great works now being executed in the extension of the Victoria Docks. Many of us have long resisted the exclusive use of concrete for walling, and have preferred the use of masonry or brickwork, if not for the entire thickness at least for the facing of walls. In the Portsmouth Harbour extension works, which I visited in 1874, the back or hearting of some of the walls were of concrete, the front being brickwork toothed into the concrete. At the Victoria Docks the vertical walls are built entirely of concrete, the gravel being found on the spot, and the cement obtained from manufactories in the river Thames or Medway. These walls appear perfect specimens of such work, and have done more than anything I have yet seen to dispel ancient prejudices against the employment of concrete for such purposes. My fear has always been the imperfect bond sometimes made between walls or portions of walls executed at different periods. It has always seemed to me that when concrete has commenced setting, and you add fresh concrete, the stage in the process of setting of each portion is different, and each pursues the process with a distinct interval of time between them, and that a bad joint generally ensues along which a fracture is sure to take place if there is any disturbance of the foundations. Any one who has ever had anything to do with concrete can appreciate well the difficulty experienced in remedying a crack in a vertical wall of concrete. I would always recommend that such walls should be carried up in continuous layers, advancing the several levels equally all over the job, and that when there was an unavoidable stoppage and a vertical break, the wall should there be neatly toothed back, and the surfaces of the joints covered with cement mortar immediately previous to placing or jointing the fresh concrete to the old. For deep foundations where they are easily got at, and time is not a great object, I think lias lime concrete is almost as good, while it is generally about 30 per cent. cheaper, than cement concrete. It sets much slower, and adapts itself more readily to any unequal strength in the subsoil. In all cases where cement concrete is used, I would advise that every delivery of cement should be carefully tested. When that is so, not only are you less likely to have indifferent cement sent to you, but, knowing the strength of each delivery, you have confidence in the work you would not have if the matter were left to the manufacturer and the contractor. I employ a small machine made by Mr. Adie, for the purpose, and am much pleased at the apparent accuracy of the results.

In all walling there should be as great care shown in not putting too much, as in making sure that there is amply sufficient, for the purpose, for I am convinced that many failures or settlements which I have examined in both ancient and modern buildings have resulted from placing too great weights on an inadequate area of foundation or footing of the wall. Wherever a foundation is risky or bad, the weights should be distributed over as large areas as possible, and no more weight imposed than is absolutely necessary. It must not from this be understood that I advocate thin walls, but rather that you must not put thick walls on bad foundations. All this sounds, perhaps, very patent and obvious; but I assure you it is the obvious which is most often overlooked by those who would be most indignant and offended at being reminded of it.

With regard to masonry, I do not think sufficient attention is always paid to the quality of sand used for the mortar. If you are particular as to this, you are generally put to as much inconvenience as possible, and the contractor or foreman will produce a sample of the sand, and ask emphatically if anything can be better than the sample; this might often be answered by saying that nothing could be worse, and you must fight for the best with the pertinacity of a bulldog, or you will not get it. You ought not to cease until you get the best to be had in the district. While at St. Michel last autumn, I was struck by the quality of the mortar which had been used by the builders of that marvellous work. The surface of some interior walls, several hundred years old, had worn away, but the mortar-joints protruded as hard as the hardest cement; and this is no doubt due, in great part, to the wonderfully good sand of the district, which, united with good lime, makes the closest, most homogeneous, and best limestone that can possibly be, and far superior to the stone used in the building. The sand referred to is a fine sharp white sand, and is still famous; it is collected from the shore, stored in heaps on the adjacent land to allow the salt to be gradually washed out of it, and then carted very considerable distances.

I suppose an address of this sort would be incomplete without an allusion to the electric light. This appears now to be steadily gaining ground, and the lights are certainly more steady and effective than they were in the earlier periods of the experiments. The question of cost, so ably gone into by Mr. Valpy two years since, is still the difficulty it has to contend with. If information supplied to me is correct, the new arc light, with vertical carbons and a continuous current, gives the effect of 4,000 candles at a cost of $2\frac{1}{3}$ h.-p., and $2\frac{1}{4}$d. per hour for carbons. Taking Mr. Valpy's figures as a basis for cost, the electric light would cost about 1s. 10d. per hour, as against 10d. for gas. The cost estimated by Mr. Valpy was about three times that of gas, so that in the two years there would appear to have been considerable improvement in the way of economy in producing the electric light.

In conclusion, I would try to impress on those who, with myself, are striving each to do his best, according to the opportunities that are afforded us, in adding his contribution to the improvement of the conditions of human life, not to let the difficulties and want of appreciation which they are sure to meet with depress or discourage them. I would also recommend earnestly that in all we do we should consider carefully, and have everything ready well before the time it is actually required. If not, as is frequently the case, we have to scramble in anyhow, and finish in an imperfect manner that which was begun full well. It is the honesty and quality of every portion of our work, whether great or small, that should be our great consideration, and though we may often have to bear temporary defeats and vexations, if we are true we shall surely pass onward, notwithstanding the assaults of enemies, or the foul exhalations of conceit and ignorance.

It is generally, as I have already indicated, by a painful series of marchings and countermarchings, that any real advance is made, and while I have tried to indicate a few of the directions in which we may be useful to our race, we may be sure that there is in the future abundant work. The world of the present is slow to appreciate anything that does not appeal to financial reasoning or sensual faculties; but the advance, though slow, will nevertheless be made. In centuries to come the world, though peopled by the same race as ourselves, may present many vast improvements, toward which engineers and architects must lend their assistance. A great portion of Nature's forces now neglected or wasted may be utilised to perform much mechanical and menial work; manufactures may be rendered a pleasure, and none of them harmful; to the agriculturist his work shall have the nature of a poem; commerce shall be so conducted that, while those who go down to the deep shall still be witnesses of the wonderful operations of Nature, it shall be in confident security; the habitations of all, whether congregated in large cities or scattered in plains and valleys, shall be of perfect construction, with every requirement of health fully complied with; and though the alarm of pessimists as to the exhaustion of coal may be realised, other matters may be grown and utilised for fuel; while of all God's bountiful provisions for the necessities of mankind, none shall be wasted.

Thus may the healthiest, purest, and most cultivated lives become possible for populations far in excess of our present ideas of this world's capacity, and everything tend towards perfection,—

> "And one far-off divine event,
> To which the whole creation moves."

Mr. C. H. Driver, F.R.I.B.A., the retiring President, proposed a vote of thanks to the President for his excellent and comprehensive address, and this having been seconded by Mr. B. Haughton, Past-President, was carried by acclamation.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

THE annual meeting of the members of this association was held on Monday evening, in the Library at Queen's College: the President (Mr. W. Hale) presiding.

The President, in an address to the members said, as a very consideraable amount of attention was now being given to education in general, he thought they might endeavour to consider the subject applicable to the training of an architect. In the first place, it would be best to define what an architect was, or what he was expected to be, in the present day, what were his duties, and how he was to perform them? In the next place, what ought his capabilities and training to be in order to render him competent to properly discharge these duties? And then to consider whether the means usually employed, or those within the reach of the majority of students, were sufficient or calculated to effect this. An architect in very early times was probably also the builder, and even when later on he ceased to erect buildings himself, he was still, as the name implied, called "the chief builder," as he furnished the designs and directed the carrying out of the works; and although the designation of architect appeared sometimes to have been altered to surveyor or surveyor of works, one master-mind directed the whole, preparing the general design and the detailed parts. In mediæval times lodges of itinerant masons were at one time supposed to have designed and also erected with their own hands the noble buildings then so lavishly built; but although it might be possible that some minor details of moulding or carving might have been delegated to the individual talent or caprice of several persons, he thought most people who had given attention to the subject would be disposed to agree with Mr. Street that there was but one architect or director of the works, who conceived the whole work in hand. In his "Gothic Architecture" Mr. Street stated that he found ample evidence of this when measuring and studying the various Spanish buildings. At the present day the architect's duties were more complex, and he could not often devote that amount of loving care to every detail, even those most remote from general observation, which characterised the practice of his more fortunate predecessors, who, in the quiet of the cloister, were enabled calmly to mature their designs and watch their very gradual growth. Now, instead of being able to carry out one important building at a time at their own doors, architects in large practice had many, and in different parts of the kingdom, so that, though they might work hard, much must of necessity be delegated to others, and, as a consequence, the impress of their own minds was not so apparent, nor could it be otherwise, as it was physically impossible to give personal thought to each matter under such a system. An architect, to discharge his duties efficiently, should be an artist, a surveyor, an engineer, and a man of business, and he should possess a good knowledge of the laws affecting buildings and land. He pointed out the advantages of a systematic training being commenced so soon as the general school education was completed. Without a good general information an architect must not expect to hold his own in the present day, when every path in life was so crowded, and those who had hitherto neglected any opportunity of improvement should make up for lost time whilst young. A knowledge of Greek and Latin was most advantageous, although these languages were not necessarily essential to the proper study of the Architecture of Greece and Rome, as those beauties had been fully set forth in our own tongue. He advised the reading of some of the modern French and German authors on Art. A perfect knowledge of the ordinary rules of arithmetic was absolutely indispensable, and algebra and the higher mathematics were most useful. Geometry, especially practical geometry, was also another subject it was essential an architect's student should be well versed in, as a good knowledge of these would save much time in the preparation of drawings. Perspective, also, should be mastered and much practised. Freehand drawing, too, must not be neglected, but should be constantly practised, first from copies, but, as soon as possible, from the round and nature herself. There must be careful study of the proper proportion of parts, as without it there could be no good architecture. After referring to the study of sciography, which taught them the production of shadows, he said another most important branch of an architect's education was coming to the front, and that was the principles of construction. Without a sound knowledge of those principles, it was not possible to have buildings of the highest order of art. A knowledge of the taking out of quantities he very strongly recommended, should be obtained. Some people might say, "This is a surveyor's business." To enable him to discharge his duties, every architect should be a surveyor. He need not necessarily practise as a surveyor, but he should be educated in such a way that he would be competent to discharge the duties of a surveyor if the necessity arose. An indispensable requirement was that of water-colour drawing, a knowledge of which, properly exercised, gave the power of attractiveness to the design which an outlined or simply shaded drawing seldom possessed, and it would be well to cultivate it. With respect to the means usually employed for training the young architect, he was sorry that it was impossible for him to enlarge upon them, for the simple reason they were so few. Outside the office there were now agencies for self-help at work which did not exist a little more than a quarter of a century ago. Institutes and schools of design were everywhere conducing to better means of training. The greater part of the education devolved on the recipient himself. The Royal Institute of British Architects were taking a step in the right direction. After May, 1882, no one would be admitted a member of the institute without previously passing an examination, both as an Associate and again as a Fellow. The details of the scheme were now under consideration, and perhaps it was not altogether vain to hope in some ten years or less it would not be lawful to practise a profession on which, with respect to the goodness or badness of their houses, the health, happiness, and prosperity of everyone in the country depended, without first obtaining a diploma.

Mr. Morgan proposed a vote of thanks to the president for his very intetesting and instructive address. He enlarged upon several of the principal points referred to by Mr. Hale, and stated that it was the intention of the committee to form a "quantities" class in connection with the association.—Mr. Bailey seconded the motion, which was carried with enthusiasm.

TEMPLE BAR.

AT a meeting of the Court of Common Council on Thursday week, an inportant report was brought up on the subject of Temple Bar by the City Lands Committee. They stated that on the 15th of November, 1877, it was referred to them to obtain and submit for the approval of the Court a design for a structure of an ornamental character to be erected in the centre of the roadway at the western end of Fleet-street to mark the boundary of the City's jurisdiction in lieu of Temple Bar. They had had before them several designs and models, and submitted for the approval of the Court a model of a structure which would not only indicate the site on which Temple Bar stood, and thus mark the boundary of the City's jurisdiction at that spot, but will also provide a rest for foot passengers crossing the street from the Temple to the new Law Courts. The roadway was about 37ft. wide from kerb to kerb, and, as the proposed structure would occupy a space of about 5ft. at its base, there would be 16ft. left on each side for vehicular traffic. The east and west ends of the structure would provide a rest for the protection of the public, and the niches on the north and south sides were intended for the reception of appropriate statuary. Should that model (designed by Mr. Horace Jones, the City architect) meet with the Court's approval, they recommended that they should be authorised to take the necessary steps for the erection of the proposed structure without delay. The model, which was exhibited in a committee-room, merely showed the general character of the design without its various details. The structure will be about 5ft. at its base, 7ft. in length, and 33ft. high, and will be constructed of white stone or granite. Mr. J. T. Bedford, on moving the adoption of the report, said the object of the Court had been how best to mark the ancient boundary of the City at Temple Bar. After much consideration, a conference was held in the Inner Temple between the Corporation, the Temple authorities, Messrs. Childs, Mr. Street, R.A., on behalf of the Government, and various representatives of the City Commissioners of Sewers, and they approved the "beautiful model and plan" which the committee submitted to the Court. It would in no way interfere with the traffic, for there would be a roadway each side sufficient for two carriages; but "it would be a very beautiful work of art, reflecting great credit on the City Architect (Mr. Jones)," and in all respects be worthy of the City of London and the metropolis. The motion was unanimously agreed to.

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A bequest of £1,427 has just been paid in to the credit of the School of Art at Newport, Mon.

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OUR LITHOGRAPHIC ILLUSTRATIONS.

LAMBETH DWELLINGS.

The site of Surrey Lodge, at the intersection of the Kennington and Lambeth-roads, has been purchased by the South London Dwellings Company, Limited, who are about to erect upon it the industrial dwellings shown by the accompanying perspective. This Company has been formed to provide healthy dwellings for the working class, and though a dividend to the shareholders is not a primary object, the great demand in the neighbourhood for dwellings of this kind will insure the pecuniary success of the undertaking. Shops will occupy the frontages to the Kennington and Lambeth-roads, the corner shop being a coffee tavern, and above the shops there will be four floors of tenements arranged for letting in one, two, three, or four rooms each, according to the requirements of the tenants. Access to these tenements will be gained by stone balconies on each floor overhanging the garden, which will form the centre of the quadrangle, from which stone staircases will lead to each floor, and to the flat roof with which the entire building will be covered. This flat will be formed of cement concrete on iron girders, and will serve as drying-ground, the laundries for the use of the tenants being built upon it at the angles. The buildings, which will be 49ft. high from pavement to roof, with angle towers 84ft. and 72ft. high, will be faced with red brick with moulded strings and arches, and the lower story with red glazed bricks. A tiled frieze will be formed over each shop to receive the name of the tenant. A constant supply of water direct from the mains has been arranged for, and the drainage has been planned on the most improved principles. Although the works have but recently been commenced, a number of applications for shops and dwellings have been already received. Mr. William Smith, of Kennington, is the builder, and Mr. J. Willoughby the clerk of works. Mr. E Hoole, of 30, Russell-square, is the architect.

SHOPS AND WAREHOUSES, ALDERSGATE-STREET.

We illustrate this week a block of buildings now in course of erection on a portion of the site of the so-called Shakespeare House on the west side of Aldersgate-street, and nearly facing Jewin-street. The principal materials used in the elevations are red Fareham bricks and Portland and Bath stone. The mouldings, cornices, window dressings, and dormers, are constructed of stone, and the lower pilasters to the shop fronts in red Mull granite, polished. These buildings being intended for commercial purposes, much pains have been taken to insure abundance of light to all parts, and this has been accomplished without unnecessary loss of valuable floor-space. Special attention has also been given to the sanitary arrangements. It is now proposed to omit the cupola and corner feature in the design, and to carry the building as far as the nearest adjoining houses in Aldersgate-street, leaving an archway as in the old buildings for the entrance to Bowman's Buildings, upon which the return frontage abuts. The ground-floor will be fitted up as shops, whilst the upper floors will be suitable for either warehouses or offices. The architect is Mr. George Vickery, 35, King-street, Cheapside, and the builder, Mr. W. Crabb, London.

PLANS OF CATHEDRAL AND MONASTIC PRECINCTS.

It would be repetition if I attempted to add any observations on conventual precincts in detail, especially as I have entered into full details in my "English Minsters," recently reviewed in your columns. The plan of *Beaulieu* has never been engraved; it was made by the late Rev. F. W. Baker, sometime rector; that of *Bindon* was made by Cardinal Weld, and the late Mr. Weld, of Lulworth Castle, told me that the original was lost, having been lent to an archæological society and not returned. *Netley*, the earliest subject of my boyish studies, I have surveyed repeatedly, being so near *Winchester* (that city so dear to me as a Wykehamist); the latter being founded on Milner's plan, has been supplemented by personal investigation some years since. *Dore* owes much to Mr. Buckler. The great house of the great Benedictine Monastery exactly resembles in position those of Sherborne and Norwich; the stairs to the dormitory lie parallel with the east alley of the cloister, and the latter itself has been returned eastward over cellarage, as was the case at Chester. The Prior's house was in the same position as at Norwich and Durham. The western slope has its parallel at Worcester and Norwich. The plans of Bindon, Beaulieu, and Netley have much in common. Bindon shows, however, a large rood-loft as at Valle Crucis, Cleeve, and Fountains. The gateway to the western alley of the cloister resembles that of Tintern, Merevale, and Cleeve, whilst at Beaulieu there is an inner court, as at Kirkstall, Byland, and Buildwas, and formerly at Dore. Beaulieu has also a series of unique carols in the northern alley and in the east alley; an aumbry, or cloister library, in front of the sacristy as at Buildwas and Tintern. The infirmary is well marked at Netley: in most Cistercian plans, *e.g.*, at Fountains and Jervaulx, it has been too long misrepresented as the Abbot's house. The abbots at Cleeve and Tintern lived in upper chambers overlooking the cloisters, and the case was probably the same in the generality of the houses of the order. The east end of Beaulieu is said to have been apsidal, but the ground has been deeply trenched and cut away, so that no definite conclusion can be drawn as to its existence. The strangers' entry at the angle of the west front is well marked at Beaulieu, Netley, and Tintern. Abbey Dore resembles in its spacious presbytery with aisles the eastern arms of Byland, Tintern, Neath, Netley, and Beaulieu, and its eastern aisle for altars had a parallel at Fountains in Benedictine Durham, and Hexham, and St. Mary Overie of the Austin Canons. The cemetery's door, always opening into the wing furthest from the cloister, has its counterpart at Buildwas. The cloisters were on the north side, as at Tintern and Buildwas, for convenience of water. *Eastby* of the White Canons I have selected as the most perfect from several plans made this summer, including Caverham and Blanchland, belonging to the same order. Like Caverham, it has the peculiarity of having a parish church detached from it. The single north aisle also occurred at Dale, Torre, Shap, Cockers, and in several churches of the Black Canons. Mackenzie E. C. Walcott.

HOUSE AT GROVE PARK, KENT.

This is one of several buildings erected at Grove Park, Lee, on the Earl of Northbrook's Estate. The character of the internal finishings is in harmony with the exterior of the house. The rooms in the attics are about 11ft. high, those on the bedroom-floor 9ft. 6in., and on the ground-floor 10ft. 3in. The works have been executed by Mr. N. Nevard, builder, of Burnt Ash-lane, Lee, from the designs and under the direction of Mr. Ernest Newton.

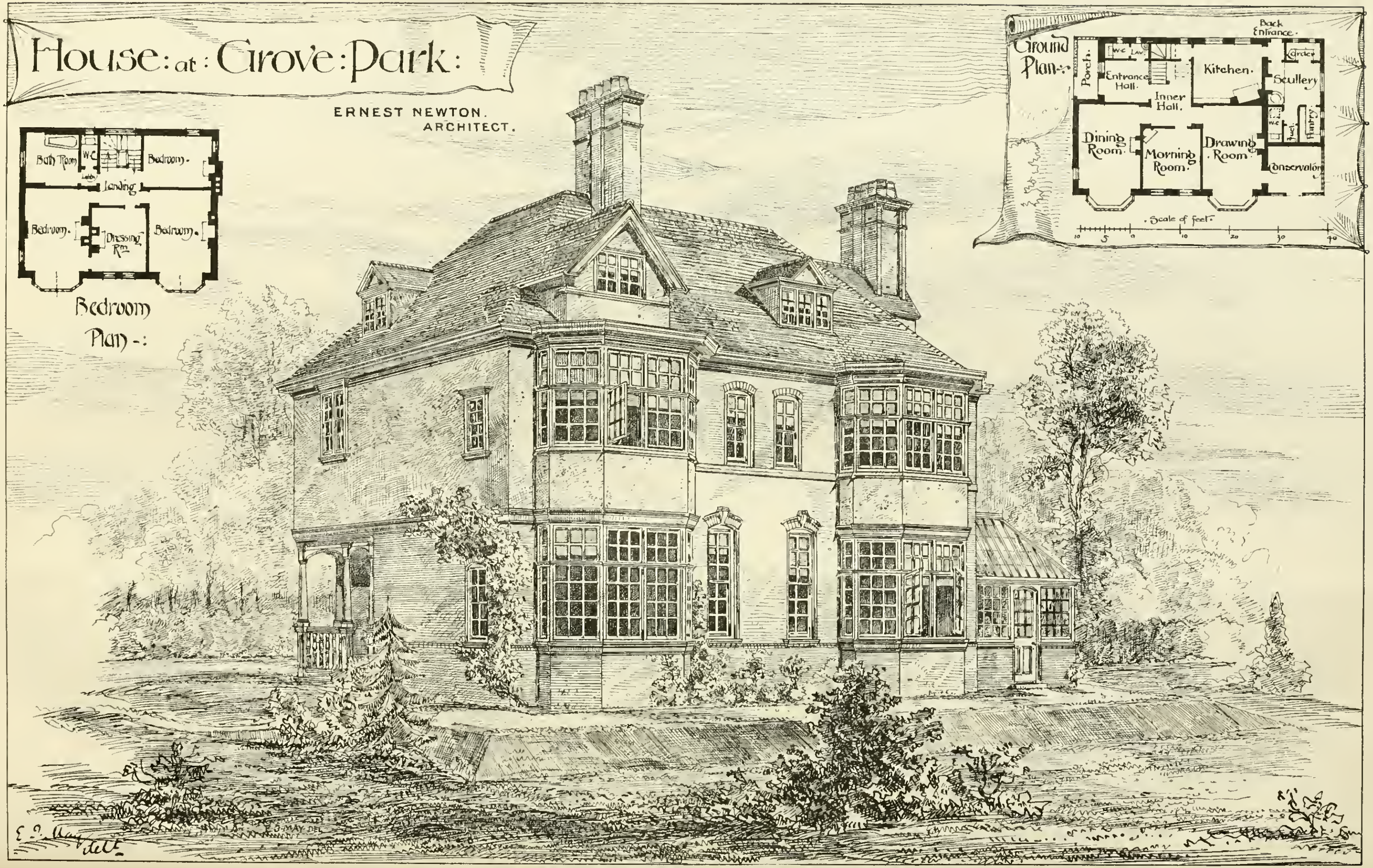
"PLAW HATCH," HOCKERILL, BISHOP'S STORTFORD, HERTS.

The house which forms the subject of an illustration this week has been recently erected from the designs of Mr. Joseph Fogerty, architect, of No. 1, Westminster Chambers, for F. W. Blunt, Esq., of Bishops Stortford. The house is in the Old English "half-timbered" style, the timbering throughout being let into the brickwork 4½in. and forming a substantial part of the structure, and not a mere sham external decoration, as frequently is the case with modern imitations of the old half-timbered work. English oak has been extensively used in the work, and was obtained at a moderate cost in the neighbourhood. The upper portion of the external exposed facing between the half-timbering is rendered in "compo," and finely pebble-dashed, the framing being grooved to key the plastering in the panels and bays. The lower external brickwork is faced with hard red pressed bricks jointed with black mortar. Portland stone has been chiefly used in the sills and mullions of the windows, and Lascelles' patent red concrete in the moulded strings and chimney caps. The contract for the building was executed by Mr. W. H. Lascelles, of Bunhill-row. The house is roofed with tiles, and, although erected during a severe winter and wet spring, was found to be remarkably dry at completion, proving that this style of construction is admirably adapted for this climate. The external walls are a brick and half throughout, and consequently there is a 9in. backing of brick wall to the half-timbering. The total cost is about £9,000, which gives a remarkably low figure per foot for the cubic contents of the house, in which it will be seen from the plans there is very large accommodation. There is an extensive basement and a number of servants' rooms, &c., in the attic story. Mr. George Perry was clerk of the works.

ARCHÆOLOGICAL.

British Antiquities.—Canon Greenwell, F.R.S., whose excavations in British barrows we have frequently noticed, has presented to the British Museum the large and important collection of urns and other antiquities formed by him during his researches in no less than 234 of these barrows. This gift will be of great value to the national collection, and its importance is much enhanced by Canon Greenwell's well-known care and experience in conducting such excavations. The discovery of a great part of the collection is recorded in his work, "British Barrows," published by the Clarendon Press in 1877.

Praxiteles.—At Wednesday week's meeting of the Royal Society of Literature, Dr. Waldstein read a paper on "The Hermes with the Dionysos Child by Praxiteles from the Heraion at Olympia." The reader's object was to show from this unique work of the old Greek master, the recovery of which is among the latest results of the excavations at Olympia, that the historical method is the true one in studying art and its archæology, there being the most vital interdependence between each work of art and the culture of its time. Summarising the contents of Pausanias's description of the Heraion, or temple of Hera, the Greek Juno, at Olympia (V. xiv.), Dr. Waldstein cited the Greek traveller's mention, among other statues adorning the building, of "Hermes (Mercury) in marble bearing the infant Dionysos (Bacchus), a work of Praxiteles." He then showed how remarkably the topographer's account of the Heraion and its contents, including the priceless Hermes group, had been verified by the discoveries of the German archæologists, who, in the spring of 1877, came upon a building precisely answering to the Heraion. Their triumph reached its height when the pure white marble of the Praxiteles statue gleamed forth, to clinch the many earlier proofs that their identification of the site had not been premature. Little by little the beautiful lines of a youthful figure firmly embedded in the fragments of a wall which had fallen over it came to light. Some parts of it had not yet been found, but fragments of the figure of a little child, formerly seated on the principal figure's left arm, were picked out of the rubbish. The hand of a little child is clearly to be seen on the left shoulder of the Hermes bust, a plaster cast of which, sent by Professor Curtius, was exhibited at the meeting. Nothing could be more circumstantial than the manifold coincidences with the Hermes group mentioned by Pausanias.



House: at: Grove: Park:

ERNEST NEWTON.
ARCHITECT.

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

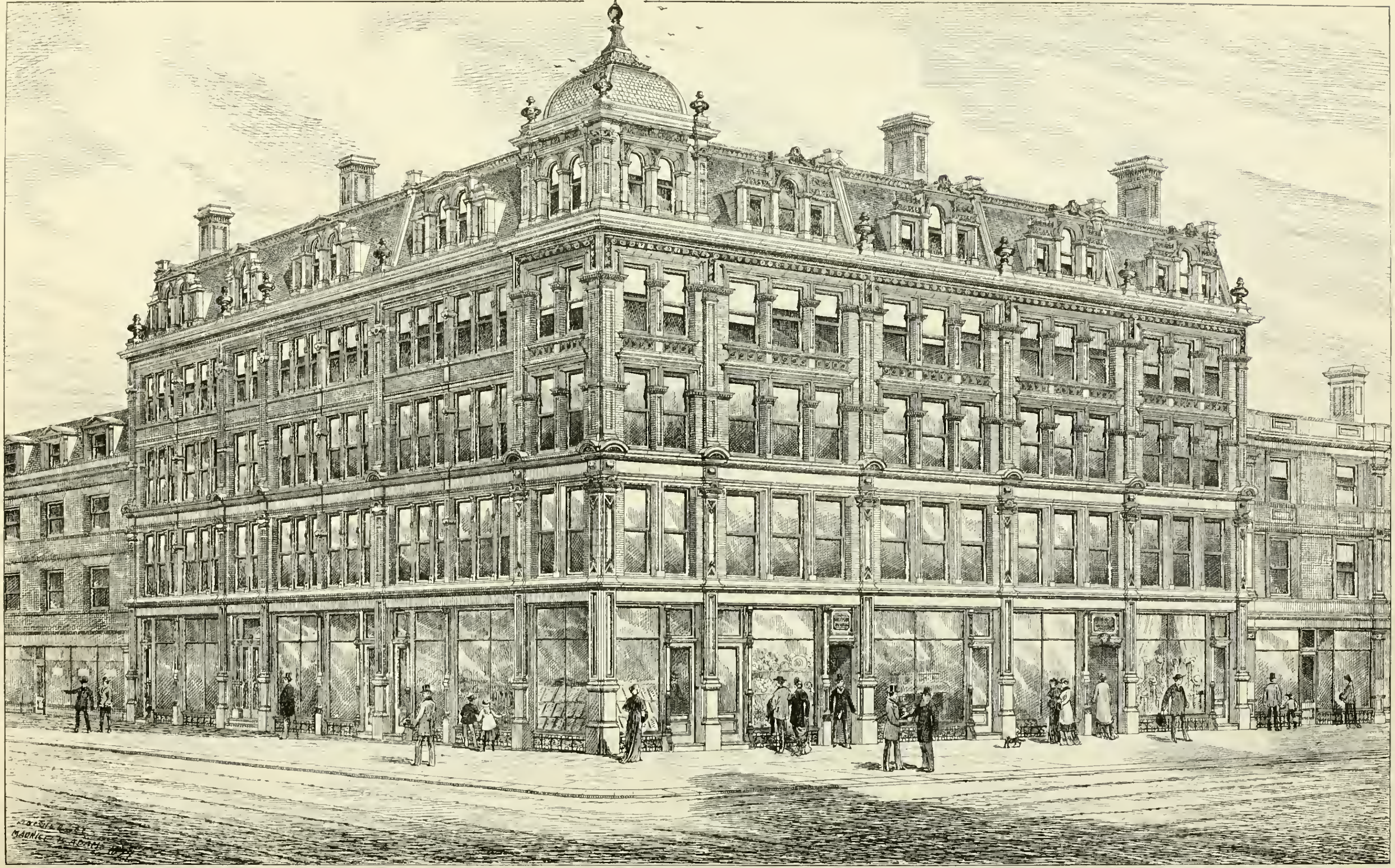
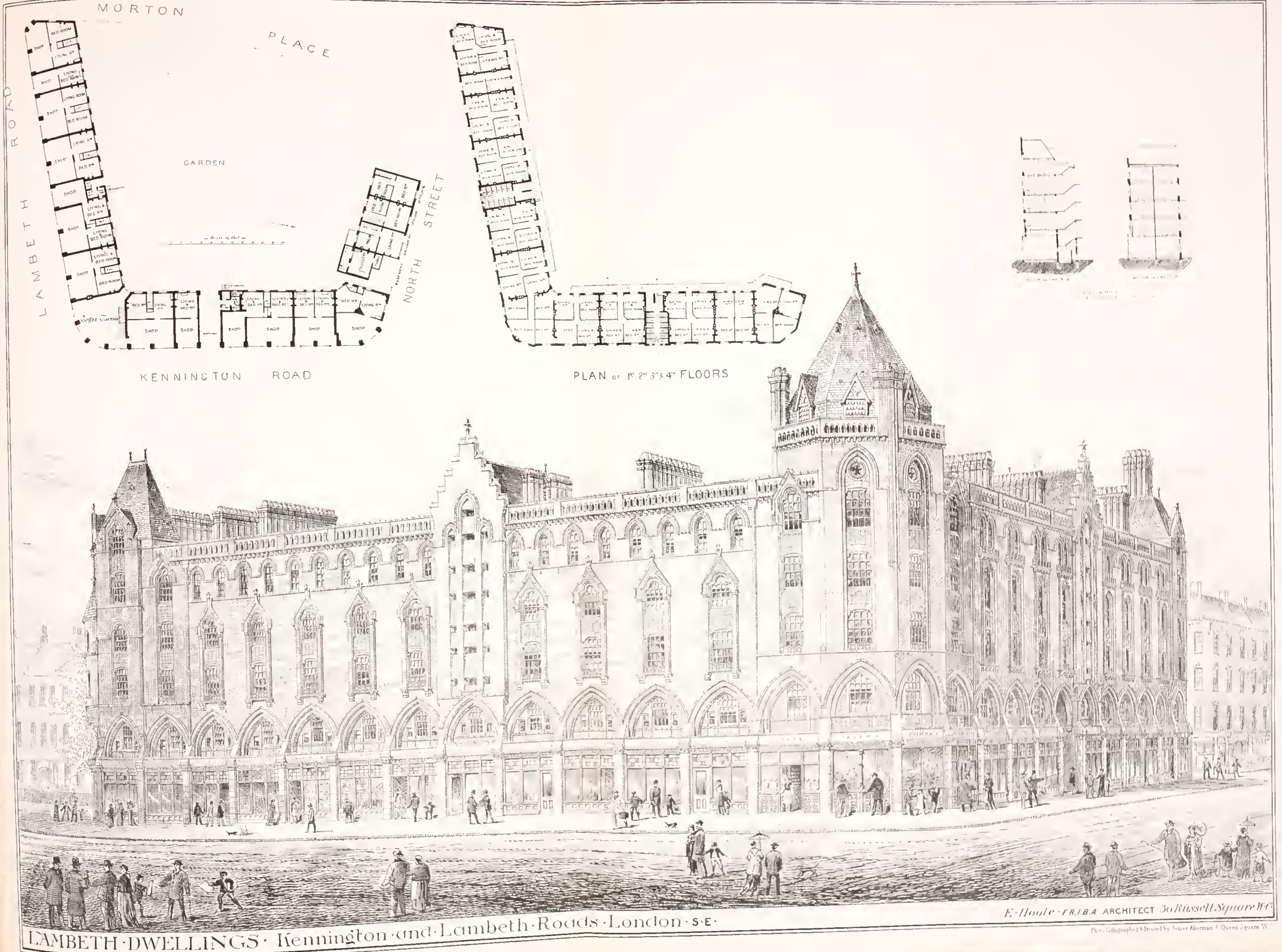


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C

NEW SHOPS OFFICES AND WAREHOUSES ALDERSGATE LONDON E.C. *George Vickery Archt* 35 KING STREET, CHEAPSIDE E.C.



E·Hoole·F.R.I.B.A ARCHITECT 30 Russell Square W.C.

LAMBETH·DWELLINGS· Kennington·and·Lambeth·Roads·London·S·E·

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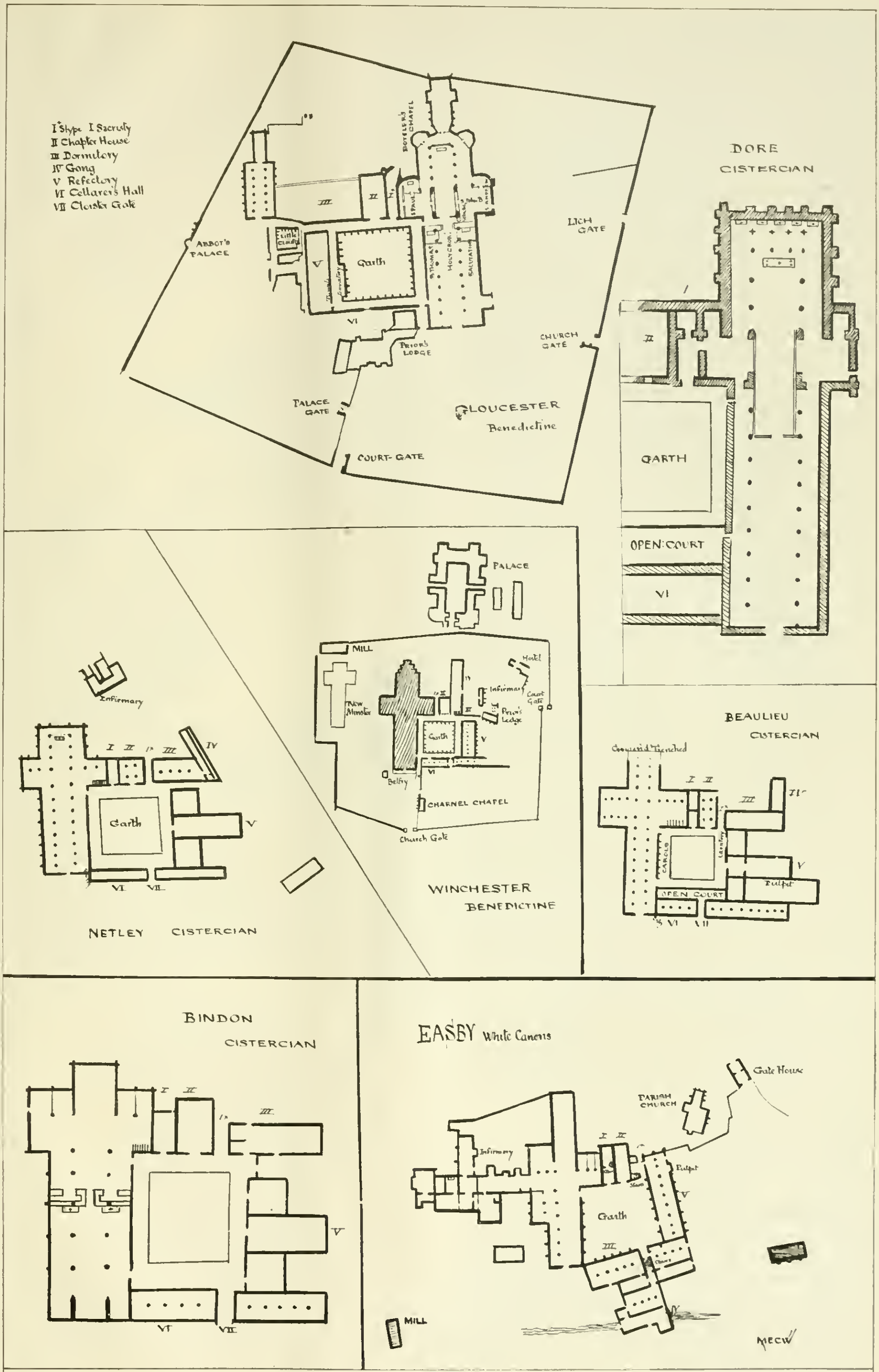

PLANS OF CATHEDRAL AND MONASTIC PRECINCTS

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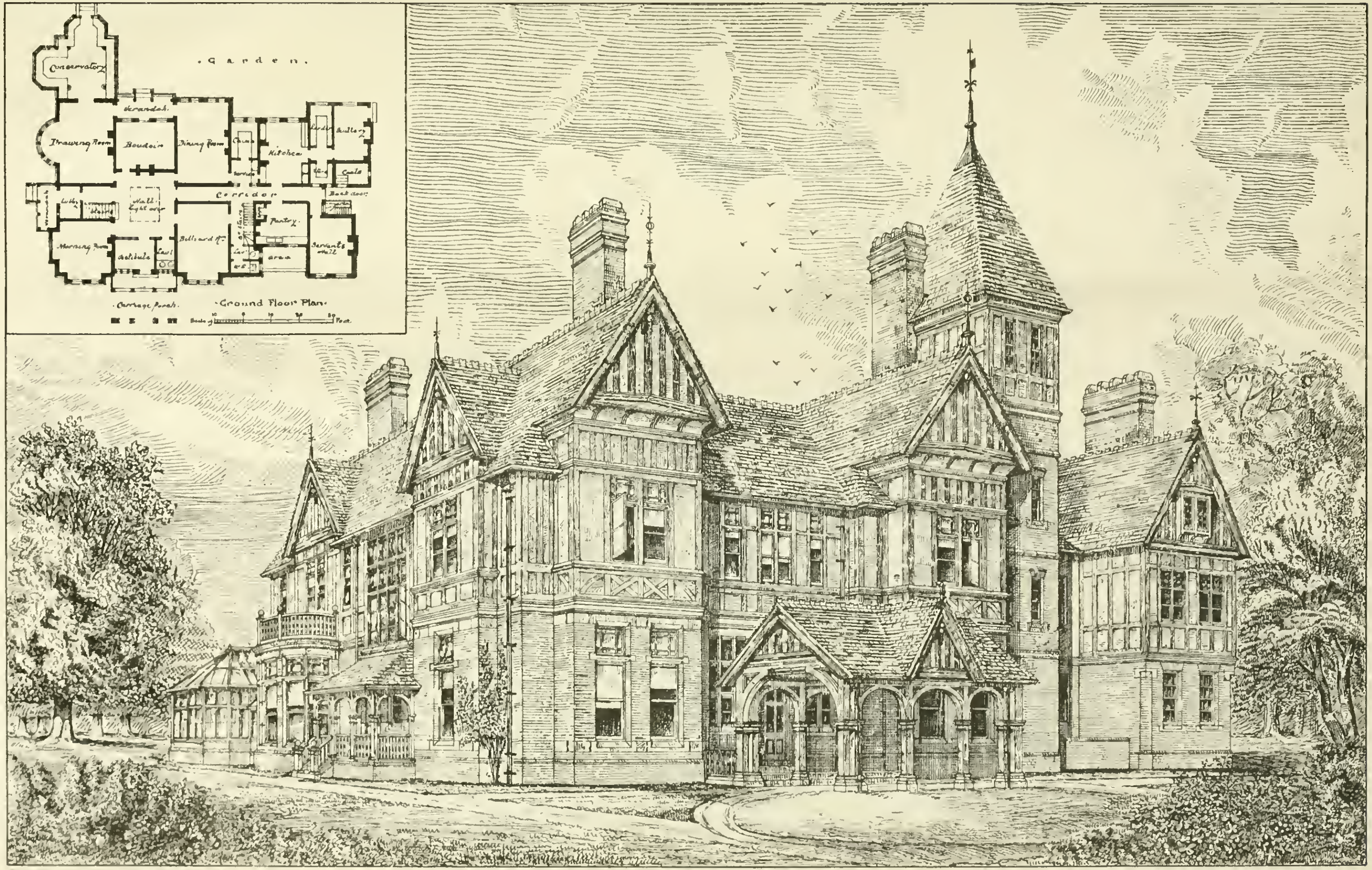
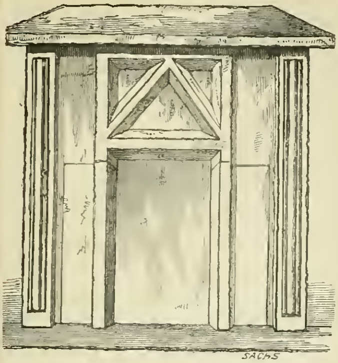


South East View of Plaw Hatch, Herts.

The Residence of F. W. Blunt Esq.

Joseph Fogerty, Architect.
1, Westminster Chambers, S.W.

THE CHRISTIAN ALTAR,[*] ARCHITECTURALLY CONSIDERED.



THE title of this paper,[†] though not exactly conveying the idea intended, was adopted with the object of definitely distinguishing it from "The Christian Altar, in a theological or polemical point of view."

The term "altar," though most frequently used in ecclesiastical language and in common parlance, is, in fact, synonomous with the terms Mensa Domini—God's Board, the Holy Table, one or other of which is generally adopted in the Prayer-Book. Thus in the Sarum Missal from which that book is chiefly translated:

> "Presbyter in mensa, Christe quid agis bene pensa;
> Aut tibi vita data, aut mors eterna paratur."

And the expression Christ's Board has been frequent in English vernacular literature from the time of Allfric's Paschal Homily, and instances dating from the 12th and subsequent centuries are readily obtainable. The controversy in the 17th century, commencing with a pamphlet entitled "The Holy Altar, Name, and Thing," related only to theological matters.

The oldest existing Christian altar is one which is preserved in the Basilica of St. John Lateran, at Rome. It is believed to have been used by St. Paul, the tradition of which has come down from a very early period, and so highly was the altar esteemed, that in 1362-70 a stone baldacchino was erected over it, wherein are enshrined the heads, as it is believed, of St. Peter and St. Paul. The altar has the special dignity of being the only wooden altar allowed by the Roman church; it, alone, contains no relics, and no one but the Pope himself officiates at it. It presents, therefore, a typical example. The form is nearly square, and the height about 4ft.; and the structure, of wood, consists of a tabular surface resting on four legs, which, with the intervening space, are covered in by three planks on each face—it is said to be of cypress-wood—and the surface has the appearance of having been planed.

Wooden altars are mentioned by Optatus, and by St. Athanasius and Augustine of Hippo, and the material was deemed a reminiscence of the Cross of Calvary. In England they continued in use till the end of the 11th century, when stone was ordered as being a more suitable material. A canon made under Archbishop Lanfranc, in 1075, directs this change, and, according to William of Malmsbury, stone altars were introduced into England by St. Wulstan of Worcester, who died in 1095. In Ireland a canon of Archbishop Comyn, in 1186, prohibited any celebration on a wooden table, according to the then usage, but permits the introduction of a small piece of stone into the middle of the wooden mensa; probably the like provision was adopted in the examples of wooden altars, which appear to have been in exceptional use in England subsequently, as, for example, in the case of a wooden altar mentioned by Erasmus as existing in Canterbury Cathedral. In the Eastern Church wood continues to be used.

The use of stone as a material for the altar is supposed by some to have been derived from the catacombs. As early as A.D. 509 a canon of the Council of Epone directed that no altar should be consecrated with chrism unless constructed of stone.

The top originally was nearly a square slab, resting on supports in every variety. In the remarkable examples existing at Ravenna, and others represented in the mosaics there, they appear either as tablets or as solid cubes; if as tables they are found to rest on three or more legs or pillars, but usually five, arranged as a large central, and four smaller shafts at the angles; or the mensa rests upon large slabs at each end, or upon a bracket from the wall. As an illustration of the table form, we may note that when Pope Vigilius (in the sixth century) fled from the soldiers of Justinian to St. Peter's Church, he there clung to the legs of the altar of St. Euphemius, till the faithful flocked around and drove away the soldiers and rescued him. In the other, or solid type, there were sometimes excavations to contain relics, or for use for the Easter sepulchre, or sometimes even made available as a cupboard for altar fittings. It will be remembered how Harold, when ratifying with an oath his renunciation of the crown of England, found with dismay that relics had been concealed in the altar on which he had placed his hand in order to give to the act a greater solemnity. Sometimes the altar is formed of one single solid block of stone, as at Spires and Vienne, and at the old Dom, Ratisbon, where such a block is hollowed out to contain relics, its dimensions are 72 × 58in. and 42 high. Generally, however, altars were constructed of ordinary masonry, with one great slab called the Mensa covering the top, and of varying size up to 13ft. or more in length, and one at Immensee measures about 16 × 7ft., but probably this example is not of great antiquity. In very rare cases, of which there is an instance in the baptistry at Ratisbon, the mensa is composed of more than one piece. Occasionally, though rarely, the front of the altar was enriched with carved arcading and sculpture; but the general rule was to leave it a perfectly plain surface of walling, covered by a movable frontal of any precious material from gold downwards, and in this country usually of embroidery.

In speaking of the front of an altar, the terms middle and right and left sides were used, and these terms were never applied by canonists or ecclesiastical writers to the north and south ends. In the south of Europe, as, for example, Spain, they always speak of the Gospel and Epistle sides with the same meaning.

Originally, as typifying the unity of Christ and His Church, there was but one altar in each church, as referred to by SS. Ignatius, Irenæus, and Cyprian, and by Tertullian and Eusebius, of Cæsarea, and such is still the case in the East, though they have other altars in detached oratories around the building. It was this ancient usage to which the English Church reverted for its general rule, though there is no canon to prevent more where they are required as a matter of convenience. At an early date the number was increased; thus we read that Constantine the Great had 3 in the Church of the Holy Sepulchre in Jerusalem, and 4 in the Church of St. Mary, in the Valley of Jehoshaphat. In the year 326 Bishop Aventius consecrated 3 at Avignon, and in the same century we hear of 7 in the Lateran Church at Rome. In the 6th century Pope Leo the Great mentions 13 erected by Palladius, Bishop of Saintes, in honour of the Apostles; while the building plan of the Church of St. Gall, in the 9th century, indicates the spots allotted to 17; and there were at least 14 chantries in St. Paul's Cathedral at the time of their surrender. In some cathedrals, and even parish churches, their number became multiplied to what must be deemed a very unnecessary extent, as in the churches of St. Mary, Dantzig, and St. Elizabeth, Breslau, each of which contains about 50 altars.

At an early date, when the basilica became (or became the type for) the fabric of the church, the altar always stood in the chord of the apse; behind it stood the celebrant, facing it and the people, while round the apse were the seats for the bishop and other clergy and assistants. This arrangement has been preserved, and is still in occasional use in certain churches, chiefly in Rome, which are termed Basilicas, and possess special privileges, and the rubric of the Ambrosian rite assumes the practice to be such. Where this was the case the apse, from an early period, was at the west end of the building, so that the priest faced eastwards while officiating; but when choirs were built out, they were always at the east end (at all events, in northern Europe, though in Rome orientation was little regarded), and the priest, still facing east, necessarily had his back to the people. At Maintz, and some other cathedrals, there is an altar at each end, that at the east being the high altar, daily used, while that at the opposite end is only used on special occasions, and then the celebrant occupies the Basilican position.

The high altar is defined by our great canonist, Lyndwode, to be that of him to whom the church is dedicated, and placed in the choir or most solemn part. Occasionally, but not usually, it stood detached from the wall. When other altars became multiplied they were placed in all parts. Behind the choir of a cathedral was a Lady-chapel, flanked by a range of smaller chapels radiating from the aisle, or ambulatory, which was so generally continued round the aisle. The choir being bounded on the west by a rood-screen, an altar was placed on the outer side, which, in the case of a monastic church, was used by the parishioners; it was ordinarily dedicated to the Holy Cross. It would appear that sometimes there was an altar in the rood-top itself; not unfrequently the position was more advanced, under the central lanthorn or dome, as at Angoulême, Bordeaux, Madrid, and Spires. Beside these there were very constantly, even in the smallest churches, altars at the east end of each aisle, while cathedrals and larger churches had chapels, each with its altar, along the east walls of their transepts, and many others built out, as part of the original plan, between the deep buttresses (as was common in France), or severally erected subsequently (as more usual in this country), and were generally the private chapels of families or confraternities by whom they were erected and endowed or maintained. Also, altars were placed backing against the nave-pillars, as at St. Stephen, Vienna, and Buda; at Boppard, on the Rhine, is the singular arrangement of an altar at the east end of each triforium gallery; while at Compton, in Surrey, the eastern half of the chancel was vaulted at half its height, and arranged with the high altar below and another just over it, both visible to the congregation.

An arrangement very commonly found in Italy and the South of France and Germany, is that of raising the choir upon a crypt, respectively reached by flights of steps; in the crypt, which is called "The Confessionary," are the relics of the Patron Saint placed in a kind of tomb, immediately under the high altar, while under the east wall of the crypt is another altar. In this arrangement the choir is raised above the level of the body of the church as much as the crypt is below that level. While thus referring to the occasional great elevation of the choir with this particular object, it may be well to note that in the immense majority of our English parish-churches the choir and altar were very little raised above the level of the rest of the church, as shown conclusively by the relative levels of the piscinæ and sedilia in the one case, and doorways in the other; illustrating the Mediæval *motif* of deepening the physical perception of mystery conveyed to worshippers by surrounding the chancel with high screens, and guarding the altar itself with side curtains; contrasting with the modern ultramontane practice of throwing down all screens, raising the altar to a high level, and by all means endeavouring to lay bare the actual manual acts of celebration to the gaze of spectators—as though sight were the first essential to faith in the Holy Mysteries.

Portable altars must be briefly adverted to; their chief object was for use on journeys, in camp, and on visitation of the sick. It is related, as an early example, that when Charlemagne made his crusade against the pagan Saxons, St. Denis, who accompanied him, had a portable altar. It generally consisted of a small square slab of precious material, such as marble, agate, onyx, porphyry, or amethyst, set in a frame of gold or silver enriched with precious stones and enamels, and between the back of the slab and the setting was some relic: the frame often shut up like a diptych. Various examples of very early date still exist; a silver one, of Saxon date, was found in a coffin at Durham; one of the 10th century, cased with silver, is preserved in the treasury at Orviedo; and a magnificent specimen in the King's chapel at Munich dates from the 12th century.

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[*] The illustration at the head of this article is a sketch from an altar in the church of S. Apollinare nuovo, Ravenna, which church was built by Theodoric in the sixth century, as the cathedral for his Arian bishops, subsequently consecrated to the use of the orthodox, and received its present dedication in the ninth century.

[†] Read by Major Heales, F.S.A., at a recent meeting of St. Paul's Ecclesiological Society.

The consecration of an altar was a ceremony distinct from that of the church, but both were performed with the aid of chrism, in remembrance of the anointing of Jacob's pillar, the earliest recorded instance of which was by Pope Felix II., c. A.D. 276: the Canon of the Council of Epone in 517, and the excerptions of Ecgbricht in 740, forbade the consecration of altars by unction with chrism, unless they were of stone, and the latter ordered that no priest should celebrate except on a hallowed altar, and very similar enactments were made by the Convocation, c. 960, temp. King Edgar. Cranmer's *Reformatio Legum*, apparently with this view, forbids celebration in private houses. Relics were very usually inclosed in the altar, as a matter of necessity according to Ayliffe, but Lyndwode considers that without them the act of consecration was still effectual. An altar was desecrated by removal of its mensa or its grave fracture, or by a change of form of the altar, and a desecration of the high altar had the effect of desecrating the church so that both needed a re-consecration, though in some cases the minor rite or reconciliation would suffice.

The general destruction of stone altars which took place in this country in the 16th century was viewed by many persons with disfavour, and amongst others, by Day, of Chichester, but some bishops refused to take part in it; the destruction was chiefly effected pursuant to Ridley's injunctions in 1550. The proceeds of the sale of the materials were generally spent in repairs of the fabric of the church, but sometimes to other uses, as at Rayleigh, Essex, where the parish paid twenty shillings (not then a trifling amount) to the stage-players that played there on Trinity Sunday. Some altars were re-erected in the reign of Queen Mary and others in the Laudian period, and the Republican Parliament passed an Ordinance in 1643 directing that all altars and tables of stone should be utterly taken away and demolished.

In concluding this sketch of a subject which (so far as I am aware) has not hitherto been so fully treated, it is proper to advert to the use of the altar for the purpose of giving very special solemnity to any act; thus, in ancient times, the Emperor of Germany was, at his consecration, set upon the high altar of Maintz Cathedral, and the Pope is seated on the high altar of St. Peter's after his election. So we may refer to Harold placing his hand upon the altar to add solemnity to his oath. In Wightred's "Dooms Ecclesiastical," A.D. 696, are provisions for the manumission of slaves at the altar, and the purgation of the accused of various ranks. From the 13th century a salmon was yearly presented on the high altar of Westminster Abbey, in commemoration of the acquisition of rights of fishery in the Thames. At St. Paul's Cathedral, until the time of Queen Elizabeth, there was annually offered before the altar a doe in winter and a buck in summer, garlanded with roses and flowers, in acknowledgment of a grant of land by the chapter. In like manner, a stag was offered at Durham by the Neville family; at York Minster a lamb by the tenants; and at Leon, in Spain, each year on the 27th August there was presented a quarter of a bull that had been killed in the last bull-fight.

LIVERPOOL ENGINEERING SOCIETY.

THE fortnightly meeting was held on Wednesday evening, 17th inst., at the Royal Institution, Colquitt-street, and the proceedings commenced with the election of the officers for next year, Mr. Alex. Ross becoming president, Messrs. Baldry and Morgan, vice-presidents, Messrs. Lyster, Bevis, Maginnis, Findlay, and Pain, members of council, and Mr. J. J. Potts, hon. secretary.

Mr. M. E. Yeatman, the retiring president, next addressed the meeting. Dealing first with the affairs of the Society, he briefly reviewed its advance during the four years of its existence from a private association of engineering students to a recognised position among the scientific societies of Liverpool. While regretting that the present year had for the first time shown no increase in the number of members, he thought that the papers read before the Society had, on the whole, reached a higher standard than previously, and expressed a hope that some proposed changes in the number of meetings might not only lead to a further improvement in this respect, but might induce some of the senior members of the Society to become more frequent attendants at its meetings and to accept in future years those offices which had hitherto been held by men who were comparatively juniors in the profession.

Passing to the outside events of the year, after noticing the remarkable advance in the price of iron between August and September and its possible bearing upon engineering prospects, Mr. Yeatman enumerated the principal works completed or in progress during the year, making special mention of the Forth Bridge, the Severn Bridge, the Victoria Docks Extension, the Ramsden Dock at Barrow, and among local undertakings the Cheshire Lines North Extension, the North-Western Railway Company's Works, the new docks at Bootle, and the Seacombe Ferry Works. He concluded by hoping "That the signs, at present somewhat uncertain, of increasing activity in engineering enterprise and in commerce generally, may be speedily verified: that peace may be preserved at home and restored to our colonies; and that the wealth of England may no longer be expended on unprofitable warfare or in the annexation of unmanageable dependencies, but may rather be applied to develop the resources of the vast dominions which already own the sway of our Queen, to improve the means of communication with our brethren in all parts of the world, and to facilitate the distribution over the face of the earth of those good things God has given for the use of man."

Mr. Ross, the president-elect, then took the chair, and votes of thanks were passed to the president, vice-presidents, and members of council.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL general meeting of Fellows only of the Royal Institute of British Architects was held at the close of the ordinary meeting of that body on Monday week (as noticed in our last issue), to consider proposed alterations in the by-laws affecting membership. Copies of the revised charter and by-laws, together with the revised nomination forms, as recommended for the consideration of the members, were on the table, and after explanations from the chairman for the evening (Professor T. Hayter Lewis, V.P.), it was resolved that the by-law 34 be expunged, and that in place of the said by-law the following be inserted, viz.: "Honorary Fellows shall not be required to pay any subscription or make any donation to the Institute." With reference thereto it was further resolved that the Council have power to alter or expunge, in by-law 64 and other by-laws, words affecting the spirit or intention of by-law 34 as now amended. With reference to the amendment of the forms of nomination No. II. and No. IIA., respecting candidates for membership resident abroad, the following forms were approved: "No. II. (Fellows resident abroad.)—A. B., of ——, having read the charter and by-laws of the Royal Institute of British Architects, and being duly qualified and willing to conform thereto, is desirous of being admitted as a Fellow. [Here state the candidate's qualifications for election.] We, the undersigned, do hereby nominate and recommend him to the Council for ballot, his works being of sufficient importance, in our opinion, to entitle him to admission as a Fellow. Witness our hands this —— day of ——." (The signatures of candidate and of three Fellows to follow.) "No. IIA. (Associates resident abroad.)—A. B., of ——, having read the charter and by-laws of the Royal Institute of British Architects, and being duly qualified and willing to conform thereto, is desirous of being admitted as an Associate. [Here state the candidate's qualifications for election.] We, the undersigned, do hereby nominate and recommend him to the Council for ballot, he being, in our opinion, entitled to admission as an Associate. Witness our hands this —— day of ——." (The signatures as before.) With reference to the amendment of form No. III., respecting the nomination of honorary and corresponding members, the following form was approved: "No. III. (Hon. and Corr. Members.)—A. B., of ——, is desirous of being admitted as an Honorary and Corresponding Member. We, the undersigned, do hereby nominate and recommend him to the Council for election as Honorary and Corresponding Member, his works being known to us, and being of sufficient importance, in our opinion, to entitle him to such distinction. Witness our hands this —— day of ——." (The signatures as before.)

"BUILDING NEWS" DESIGNING CLUB.

DESIGN FOR A VILLAGE BANK.

THE designs for this subject are numerous, but we cannot say that any of them have realised the kind of building intended. "Domestic," who comes nearest in point of arrangement, and gives us pleasing, though rather quaint, elevations, has confined his plan to the size we published; the public entrance to the bank is placed on the right-hand side of the widest front, and opens directly into the space before the counter: it would have been more desirable if space for a small inner lobby had been obtained. The manager's-room, 9ft. 6in. by 8ft. 7in., occupies the remaining portion of the frontage, and is lighted by a front and a return window in the side; the doorways to it are conveniently arranged on each side of the counter, so that the manager may enter his room from either side of the banking-room. There is a private entrance in the rear behind the manager's-room, with staircase to living-rooms and bedrooms, and a useful w.c. and lavatory near the lobby. A good strong-room is got on one side of fireplace to the banking-office. On the first floor there is a living-room over the latter, a small bedroom over the manager's-room; the kitchen is obtained on the second floor. The place is generally compact and the w.c. arrangements are good, but we do not see how the flue from the banking office is to be turned easily into stack. The staircase windows on the side elevation produce an unfortunate irregularity in the arrangement of openings on this side; it would have been better to have had a lofty light over the side entrance. The author obtains additional space on his upper floors by projecting beyond the front of his bank, which is built in brick, the upper part being plastered. The mullioned and transomed windows are appropriate. "Edwin" sends a well-designed elevation for the front in a Late Gothic, suitable for a stone district. The windows to bank are cleverly arranged, and have an official look, and the doorway, with pointed arch, is at one side, and leads into a small lobby. The public space in front of counter is too small, and the clerks' portion might have been reduced. The manager's-room is placed in the rear, opens from the clerks' office. The lavatory arrangement is convenient. A staircase in the rear leads to an entresol, comprising the kitchen and housekeeper's bedroom. On the first floor the whole area, except stairs and w.c., is devoted to a sitting-room, and there is a large bedroom above. Cellars are provided, in which the strong-room is located, rather out of the way. A small safe is shown under the entrance, for the manager's use. Ingenuity is evinced in the planning, but the perspective is badly drawn, or the side-street ascends too rapidly. "Jack's" work is, as usual, characterised by piquancy in the detail and grouping; the side elevation is certainly picturesque and artistic in feeling, but the front is spoilt by a rather queerly-corbelled bay-window at the top, and, on the whole, a good plan is sacrificed to a rather whimsical external treatment. The entrance to bank, and the arrangement of clerks' and manager's office, the lavatory, &c., are conveniently managed; but there is a too-cramped side-entrance and stairs; the windows are awkward, and the kitchen landing small, though the author has rather cleverly attempted to overcome this difficulty by a projecting stair. Local stone is specified for the ground story, the upper part being in red brick, with purple-tinted brick quoins; brown tiles for the roof, and lead glazing to staircase. If "Jack" would be a little more moderate in his enthusiasm for Queen Anne, it would be better for him. "What Do You Think" adopts timber and brick-nogging in the upper stories, the walls below being of stone. The author has managed to impart a village-like effect to his elevation, but the roofing and chimney-stacks are awkwardly arranged, the long hip would look particularly so in perspective. In the plan the author cants the angle beneath a salient corner-window, and obtains an angle entrance to the bank; the manager's door would have been more convenient if placed to open into the clerks' office; the private passage entrance is rather wasteful of space, and the windows and fireplace of sitting-room are badly distributed. Unlike the last, "K in Circle" goes in for a stone and brick building, quite monumental in type. He also adopts the corner entrance, and marks it by an octagon bay carried above the roof as a cupola. The style chosen is Late Gothic, with Elizabethan features, not unsuitable; the bank, clerks' and manager's-rooms are well-disposed in the alternative overlap, but the private entrance and first-floor arrangement are defective. There would be apparently lack of headway in the first flight of stairs, and the landing and parlour are much too cramped. The position of the stacks shown, too, would necessitate some queer turning in the flues. "Sub Rosa" adopts the same style; the elevations are simply treated, but the bank windows are scarcely pronounced enough, and we might mistake the elevation for that of a private house. The plan is cleverly managed, the manager is located conveniently in relation to the banking office, the strong-room and his own private entrance and staircase; and the conveniences, are well placed. The author estimates his design at £700, the materials being red brick, and stone fireproof landings. "Castello" is a design in a Late Gothic style, intended to be built entirely of coursed masonry, though the estimate given, £465, is small. In the treatment there is much to commend, but the plan has defects; thus, the manager's-room is not in convenient communication either with the clerks' office, or the private part of house, which are on opposite sides; the staircase windows are awkward, and the kitchen inconvenient in shape and position. The bank flue would have to be twisted awkwardly to make it enter the stack at the side, and the flues are shown wrong on the second floor. "Honey Dew" sends a well-drawn set of elevations and plans. The upper stories slightly overhang, and are of timber, filled in with cement, the ground-story being of red bricks, with freestone dressings. The style is suitable, but the chimney-stacks are heavy at the top. There is a corner entrance to bank. The passage between manager's and strong room is wasteful, and the author has not made the most of his first-floor plan. The landing and sitting-room are both cramped. Motto "J. L." has given a character to his front elevation, but the centre entrance, with manager's room on one side and bank on the other, would be extremely inconvenient. "Am I?" is a bold and well-conceived design in stone and brick, in a suitable style. There is a centre entrance to the bank, a counter extending the whole width of the building, but the manager's room, private entrance, and stairs are a little confined in space, and the upper floors are divided rather awkwardly. Much ingenuity has, however, been shown. "Sub Silentio" has also exhibited tact in his office arrangement, which is economically contrived, and the first floor has a good sitting-room; the other rooms are cramped. We do not like the elevation so well. "Stone in Circle" signifies its material; the design is Late Gothic, but we find fault with the crowded effect of bank window, produced by the corbelled oriel; the entrances, too, are insignificant. The planning is not without merit, but the stairs and landings are unsatisfactory. "Nineteenth Century" is a clever and picturesque version in Queen Anne, a trifle too extravagant, tiled in the upper floors, with overhanging bay on one side, the object of which is to give space in the parlour. The double corner entrance to bank is more capricious than desirable, the private entrance to the private part of house through the public part of bank is objectionable, and the kitchen and upper rooms are defective, and it is clear quaintness has been purchased rather dearly. The author of "M. A. A. in Triangle" has evidently tried to make the most of the small area, but the position of w.c. window close to entrance is provocative of mischief, and the lobby entrance extremely awkward, to say nothing of the position for the doors. The Gothic style chosen is too formal for a village. The detail, however, is not without merit. The estimate is £826. "No. 90," also Gothic, is far too elaborate in detail, and the corner oriel is unpleasing; why are the side-lights canted in the first-floor? In plan, the manager's room is not on the right side. The private stairs is rather clumsily managed. The drawings are carefully figured, and the work painstaking. "Wasp in Triangle" has put the bank proper on one side, divided in two by the counter; the manager is close to his own entrance, but any merit in plan is counterbalanced by the elaborate elevation in a style not very characteristic of a village street—the ground and first-floor stories rather suggest the publichouse. A little crowded and cramped in the plan is "Fidessa"; there was no necessity to make one entrance serve both the bank and the house; the elevation is rather overdone, and the lower story not very expressive of its use. "Greyhound" adapts a rather Flemish kind of Gothic, the angle window is a pleasing feature, but suffers from the meaningless ironwork at the top; the manager is not well-placed for his clerks, and the living-room is small. "Such a Dog" sends an elevation in the Gothic style possessing some pleasing features; the plan is well-arranged and the manager's-room convenient in position; but the stairs are very cramped. "Franc Tireur" has an elevation at least picturesque, but the projecting gables are extravagant; the plan is spoilt by the centre porch, and the location of manager's room is not the best. "Spray in Circle" has a well-conceived plan, though a little cramped in the private entrance; the elevation is drawn in a characteristic style, and the design exhibits taste. "Alonzo the Brave" also shows feeling and some good detail a little cut-up in parts, and the plan is somewhat crowded in the entrances, especially the public lobby, but there are good points. The sequence in which we have placed the above designs must not be taken to mean order of merit. It would be impossible to detail half the designs received. "Clausman," "Our Praises are our Wages," "North-West," "E in Circle," "N. or M.," "F. W. in Lozenge" exhibit good points in planning, but all fail to express the semi-public character of a village bank. "Ora et Labora," "C in Circle," "Subjudice," "Resurgam," "Tim," "As You Like It," "Mot," are, on the other hand, too pretentious, and many of them would be more suited for the streets of a small town. "Resurgam" is overdormered, and the private stairs too full of winders; "C in Circle" is extravagant in Gothic detail, and the hipped dormers and corner oriels are costly, and out of place; "Burswell" is too like a shop in the window treatment, and the lobby entrance to bank is ludicrously small; while the perspective of "Tim" spoils a sensibly treated elevation if it is not extravagant for its purpose. The plans, too, exhibit want of study; as for instance, how could a manager sit in a little space 5ft. 6in. square? There are many designs, the qualities of which permit us only to enumerate them in something like order of merit. These are "Semper Paratus," better in elevation than plan; "Toltec" (spoilt by a corner gable); "Toledo," "Heart and Arrow," "Pro Bono Publico," "Wasp," "Streonshalh," "Quod," "Lancaster," "Rusticus," "N. B.," "Gwyndwr," "A. U. C. in Triangle," "Fleur de Lis" (too ornate), "Motto T.," "F in Circle," "X. L.," "Pendennis," "Gwent," "X. L. N. T.," "B in Circle," "North," "Black and White," "Never Too Late to Mend," "Timeo," "Peritus," "N. R. G.," "Attempt," "Figaro," "Ogmore," "B in three Circle," "Tace," "Set Square," "Duncan Macallister," "Peace with Honour." Some of the plans of these evince study, but others have bad entrances, and the offices are not economically disposed. The larger number of attempts are ostentatious in style, and the detail more adapted for city bank. We cannot close our review of these designs without noticing improvement from some of our younger and less experienced members. A few of them give us additional trouble by sending more than one sheet of drawings; we particularly request in future a stricter adherence to the conditions in this respect, and those who send more than one sheet must not wonder if their work remains unnoticed.

A CABINET SIDEBOARD.

"Edwin" sends us the best sketch for this subject, the drawers and space below, the overhanging lockers above, and the cut brackets with shelves for old china are well arranged, so as not to interfere with the main use of the furniture as a sideboard. The details show a cultured knowledge of the style chosen, essentially Shawesque in feeling. "Binny" must be placed next. The open-framed sides and the centre locker, with pediment, remind us of another leader of taste in furniture, though the centre break is not so satisfactory. The mouldings are good. "War in Circle" is more adapted for a drawing-room cabinet; there is a cupboard in the centre below the shelf, with secret drawers and corner what nots for bric-a-brac. A small locker is framed over the sideboard. There is an evident weakness in the legs at the angles, and a painful want of quietness in the treatment; the details are well drawn. "Honey Dew" shows a sensibly-treated piece of furniture, but the space between the side-board and glass case is too low. The detail is well drawn, but the mouldings are rather meagre in profile; "Mediocria Firma," shows an 18th-century sideboard with a glass case for bric-a-brac over it. The angle brackets supporting the latter are awkward, and the pediment at the top might have been omitted with advantage. The author is not up in detail. "F. in Circle" is light in framing, and rather spindle-like in the legs; there are drawers and shelves for china below the sideboard, and cupboards above; the mouldings are coarse, and show lack of experience. "Such a Dog" is well conceived in its parts; there is a useful space for decanters and glass in the centre, with a small locker and shelf at top for old china; under the drawers is a recess for wine-cooler and side cupboards. The mouldings are well designed. "Minted" is the motto of a similar kind of design, clever, but overdone in parts. "Sub-Rosa" is heavy in outline, and the detail rather rough in drawing; "B in Three Circles" is neatly drawn, but the mouldings would look heavy and poor. "Domestic" is designed in a quiet Classic manner, and displays taste; the shelves for books are useful. Careful in drawing and suitable is "Null Bien san Peine," but the sprays in lower panels are out of place. We have only space left to name in order of merit:—"T-Square" (mouldings very coarse), "Spray in Circle" (too ornate), "Bideswell" (heavy, but possessing merit), "Presto" (ill-proportioned), "Resurgam" (top-heavy), "Hangling" (too elaborate and lofty), "Leopilton," "Lapis," "Attempt," "Gladstone v. Scott" (too cut-up in panelling and intersecting circles). Many of the latter send designs of too pretentious an order.

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CORFE CASTLE—IVY-CLAD RUINS.

Mr. T. BOND, of Tyneham, writes to complain of the damage that is being caused to Corfe Castle and the gradual obliteration of its details by the growth of ivy, and suggests that the archæologist has higher claims for consideration than either the poet or the landscape painter. He adds, "From early youth I have been an observer and an admirer of the ruins of Corfe, but in the days of my boyhood I did not attach to the details of a building the importance which larger experience and more careful study of similar structures has since enabled me to do. But I well recollect that in those early days the ivy which now conceals the fragment of this keep only reached to about half its height, and that then some very interesting details, consisting of an arcade and other characteristic features, were exposed to view. I have a great desire to examine them more carefully now, as they would afford much help in fixing the date of the building. Alas! this is impossible; the book is closed, and I can see but the green leather binding. Again, I recollect that the noble tower which flanks the outer side of the second gateway showed some interesting machicolation illustrative of a method adopted by the besieged to repel the attacks of the besiegers. But now the tower, when viewed from the outside, no longer presents a grand mass of Edwardian masonry; it has simply the appearance of a gigantic ivy bush. The green morocco, though it may captivate some eyes, conceals the treasure within; and this noble piece of masonry is rendered useless as an object for study. If ivy is thus allowed to cover up, one after another, the most interesting and instructive portions of the building, future generations must take the description of it upon trust, for they will be unable to study it themselves. It would add greatly to the interest of the Castle if some of the rubbish were cleared away, so that the foundations of apartments now no longer standing might be uncovered, and the ground-plan of the Castle, which at present is involved in great obscurity, might be made out, in like manner as has so effectively been done at Fountains Abbey, Yorkshire, Muchelney, Somersetshire, at Pompeii, and in the Forum of Rome. I refer especially to the ground adjoining the wall built 'herring-bone fashion,' which, if it were cleared and examined, might throw a light upon that most ancient, most interesting, and, at the same time, most puzzling portion of the castle."

THE VALUE OF PRACTICAL DATA IN IRONWORK.

In our last issue (p. 702)we gave an abstract of the paper read by Mr. Graham Smith, A.I.C.E., before the Association of Municipal Surveyors at Mitcham. Although there is nothing new in Mr. Smith's treatment of the subject of ironwork, the author hinted the possibility of the engineer who closely followed theoretical deductions being misled. In fact, the most thorough knowledge of Rankine, Hodgkinson, or Fairbairn and the published formulæ is inadequate to furnish the engineer with the actual requirements of an iron structure. He is led to assume conditions of structure that do not really exist; as for example, that each member has a normal length, that the strains are always constant, that every beam and joint is capable of turning freely about its extremities, that variations of temperature make no appreciable difference in ordinary iron structures, and that reliance can generally be placed upon the assumed tensile resistance of iron under all circumstances of manufacture. Mr. Smith, for instance, mentions the English practice of making junctions with innumerable small rivets, which practically renders the structure rigid, and throws out the calculations of the mere theorist; at the same time, we are inclined to the belief that the iron is often seriously impaired at these junctions by the process of punching and drilling the plates, and the "pin connection" system so largely adopted in America seems to us to be, for many purposes, a far more scientific and reasonable mode of connection, and one which will eventually gain favour. The effects caused by variations of temperature are so important that it is surprising to find the practical engineer ignoring it altogether in some structures. Mr. Graham Smith instanced the effect of a warm day on the upper flanges of girder bridges in giving a fuller expansion even than when great loads were upon the structure, and every one acquainted with iron beams knows that the strains are considerably greater under circumstances like these, and the author observes, a variation of only 15° Fah. will produce the same effect as 1 ton actual load per square inch. These facts make it necessary for the engineer to find out what are the limits of the extremes of temperature in a given locality, and to provide accordingly in the shape of adjusting bearings and joints, or in larger flanges. The author estimates the difference of temperature in England at 82·5, but various circumstances combine to reduce this amount, and to render the change less active. For exposed positions an allowance of 7-16 of an inch in 100ft. is recommended by Mr. Smith for the purpose of eliminating strains due to change of temperature.

It is a common mistake to think that in designing iron beams the work is economically done when the strains have been duly calculated and the numbers specified to be of certain sectional areas to resist them. A great deal more depends on the quality of the iron that may be obtained, the dimensions and weight procurable, for it is well known that these matters often seriously impair or completely throw out the nicest calculations. It is well known by all practical architects and engineers that the depth of plate girders is as frequently determined by the width of rolled plates that can be procured as by considerations of loading or the theoretical requirements of the problem. Mr. Smith reminded his hearers of this fact, and stated that the maximum depth of ordinary plate girders is fixed by the necessities of manufacture at 4ft. 6in. Flanges also should be properly proportioned in thickness to meet the strains more economically, or the beam should be designed with a parabolic-shaped upper curve; but such a condition frequently has to be set aside when a limited number of girders are ordered, and it is only possible to vary the thickness of the plates when a large number of girders from the same pattern are required. Mr. Smith calls attention to a frequent oversight in specifications for iron girders and bridge-building, namely, that the Staffordshire iron is still required, and, notwithstanding, the Staffordshire iron is now rarely seen, the sizes from that district being small, on account of the plant employed being old, whereas in the Cleveland district modern and improved machinery is used. It is well to know that Cleveland plates can be procured without additional cost up to 21ft. in length and 4ft. 6in. in width, and 12cwt. in weight. The iron from Staffordshire is, however, tougher in quality as a rule, and it is necessary to test the quality supplied. No regard, says the author, should be paid to "brand," as it is no test of quality, and, he observes, a fair specification for girder iron is 20 tons per square inch, and 6 per cent. elongation with the fibre; for plates, 18 tons per inch, and 3 per cent. elongation; for angle and T-irons, 22 tons per inch, and 9 per cent. elongation; and for bars and rods, 24 tons per inch, and 15 per cent. elongation. The hints on preparing samples for testing, on testing plates, and on the desirability of applying proof-loads to structures are well worth the attention of those engaged in ironwork. It is necessary, however, to caution the reader against the idea that a proof-load is absolutely to be relied upon as a test of strength; hard iron will often yield less than iron of a more ductile, and, therefore, desirable quality, and much reliance cannot be placed upon the application of proof-loads, as a structure may stand one or two trials, but not a succession of loads.

LANDLORD'S AND TENANT'S FIXTURES.

We lately printed a valuable paper read by Mr. Smalman Smith, barrister-at-law at the Institution of Surveyors (see p. 639-672, 735), bearing upon the very vexed question of fixtures. There are one or two suggestions that were made in the paper and discussion well worth the attention of those concerned in house-property, whether as landlord or tenant, and it is gratifying to learn that the Institution of Surveyors have been discussing how they can assist the profession in the difficult task of defining what fixtures belong to the landlord, and what to the tenant. At present the question is involved in inexplicable confusion by the adverse decisions of lawyers, and the conflicting practice of surveyors themselves. Mr. Smalman Smith has endeavoured to clear the subject of much confusion by explaining the legal decision upon the simple basis of the "intention" of the owner in annexing an article to the freehold. If the intention can be indicated by facts, the difficulty of determining a fixture can be easily overcome. In the first instance, it is important to remember that there is an ancient maxim of the law, which declares that whatever is attached to the soil must go with it, the practical effect of which is that a tenant who fixes anything to the freehold virtually, loses his possession in it when he leaves. He may, for instance, fix up a handsome chimney-piece, in place of the common one, and according to this law the lessor can claim it, notwithstanding the lessee agree to replace the old one. He may even fix in a certain manner a bookcase to the walls, and it may be held to have been put up with the intention of "permanently benefitting the freehold." This principle, which is the root of the old feudal law, is manifestly one-sided in its consequences, as the property in a movable becomes lost by annexation to the soil. The maxim has, however, been construed more liberally of late years by the judges, who have considerably modified it by qualifications. The author of the paper defines "annexation" intelligibly. An article to be a fixture must be either actually annexed, as when it is united by means of bolts, screws, nails, &c., or constructively annexed, as when it forms a necessary and integral part of, or belongs to that which is already a fixture, even though it is itself capable of easy separation. Thus the doors, windows, locks, keys, &c., of a house may be distinct and separate, and are yet constructively annexed to the freehold. We must refer the reader interested in the subject to other principles of law laid down by the author. It is some consolation to find that many elements of difficulty can be eliminated, and that the question of the *intention* of a party annexing an article to a freehold may be determined by circumstances included under the heads: 1. The relative positions of the parties. 2. The mode and extent of annexation. 3. The nature and character of the fixture, and the use for which it is intended. These several cases are considered by Mr. Smalman Smith in detail, but it is sufficient to observe that the difficulty resides in defining the circumstances from which the law may presume an "intention to permanently benefit the freehold." The weight of recent decisions, as in Holland v. Holland, point to this one idea of intention. If the evidence produced is strong enough to raise a legal presumption of the above sort, the fixture will be irremovable by the party annexing it, but if no such intention can be presumed from evidence, the fixture will be a "movable." All questions of annexation are now referred to this principle we have mentioned, but the surveyors might profitably direct their attention to the technical point of the mode of annexation.

It frequently happens that agreements for the sale of freehold premises contain a clause to the effect that the "fixtures shall be taken at a valuation," but the articles thus indicated, Mr. Smith observes, "unless they be scheduled and expressly enumerated, will be such articles as would be movable fixtures between heir and executors." In all cases it is advised the fixtures should be scheduled for valuation. Generally as to a transfer of fixtures by sale, the law is that everything which is "constructively annexed" to the freehold passes with the conveyance of it, unless a contrary intention is indicated, hence it is of importance that the owner of a house should schedule such fixtures as stoves, grates, closets, shelves, coppers, blinds, locks, &c., before putting it up to sale, and Mr. Smith cited a case where the owner of a freehold house when he sold it, made no mention of the fixtures, and the defendant on becoming purchaser, refused to allow a valuation to be made, and it was held that the fixtures passed by a conveyance of the freehold. We hope the Institution of Surveyors will further discuss the subject till something more intellgible be affirmed respecting landlord's and tenant's rights.

ANCIENT CASTING IN PLASTER.

Mr. W. W. STORY, the sculptor in Rome, has contributed to the November and December numbers of the *International Review* two elaborate articles on a subject on which it was time that archæologists should have the benefit of skilled opinion. It has long been a question whether the ancients were acquainted with the process of casting in plaster, a process which in modern times is of incalculable advantage to the sculptor, but yet an intricate and difficult process. That the ancients modelled in plaster there is no doubt. That, however, remarks the *Academy*, is a different thing. Mr. Story would admit that some slight designs in plaster still existing with very low relief may have been roughly cast from shallow moulds, and finished afterwards in parts where the mould had been imperfect. He is unwilling to go farther than this, and asserts that there is no evidence of their ever having had piece-moulds, without which the casting of anything but a very flat design is impossible. In this statement he is confirmed by the head and two arms of a half life-size figure of Cupid in the British Museum, which he seems not to have examined. The head has been cast in three pieces, with clearly-cut joints, which have been afterwards fitted together by a band of liquid plaster underneath. One of the joints is concealed by means of a wreath round the head, which has been afterwards modelled by the hand. Similarly, the arms have been cast in two separate moulds, the one giving the upper, the other the under, side of the arm. The joints are very skilfully concealed. It may be added that the hair is painted black and the lips and eyes red, so that the whole has a very realistic appearance. These objects were found in the Cyrenaica, and appear to belong to the third century B.C. They would represent the skill of the period in casting in plaster. As regards the passage of Pliny (*Nat. Hist.*, xxxv. 12), "Hominis autem imaginem gypso e facie ipsa primus omnium expressit, ceraque in eam formam gypsi infusa emendare instituit, Lysistratus," it would seem as if Mr. Story had raised an unnecessary number of difficulties.

Mr. Brooks desires us to say that in the notice accompanying our illustrations last week of Woolwich Parish Church the name of Mr. F. G. Knight, who made the south-east view, was omitted.

COMPETITIONS.

Hall and Schools Competition at Leicester.—Designs for a large hall and schools to be built at Leicester, for the ministry of the Rev. F. B. Meyer, have been submitted in competition by the following architects practising in Leicester, viz.:—Messrs. Baker and Topott, Mr. I. Barradale, F.R.I.B.A., Mr. E. Burgess, Mr. Cowdell, Messrs. Goddard and Paget, MM. R.I.B.A., Mr. A. Loveday, Mr. Pick, Messrs. Redfern and Sawday, Mr. J. Tait (two designs), Mr. E. Turner, and Mr. Willoughby. The matter was referred to Mr. T. Roger Smith, of the Chapel Building Society, London. Of the designs six were not submitted to Mr. Smith, because the estimated cost in each case exceeded the limit assigned in the instructions. Mr. Smith has reported as follows:—

"The number of designs submitted to me was six. Your committee having already struck out some designs, the excluded ones I did not examine. The six designs examined were those of:—1. Messrs. Baker and Topott; 2. Messrs. Goddard and Paget; 3. Mr. Arthur Loveday; 4. Mr. J. Tait (Design A); 5. Mr. Willoughby; and 6. Mr. E. Turner. I proceeded first to satisfy myself that the designs had sufficiently conformed to the instructions, and that there was a reasonable probability of the estimates being found reliable if tested by actual tenders, and having satisfied myself that, so far as I could see, there was no design which ought to be excluded by me for obvious failure in either of these particulars, I proceeded to consider their relative claims to the premiums. It appeared at once clear from examining your instructions, that you required a very great deal of accommodation for the money you proposed to spend; therefore, the design selected would have to be one distinguished for strict economy of space and materials, and for compactness of disposition. At the same time, the fact of your, under such circumstances, advertising at all for designs showed that you required, if possible, a design that should possess as much architectural merit as was consistent with this strict economy. Lastly, the spirit of your instructions, and the very name of hall given to the place of worship you desire to erect, showed that the design ought to be something unusual, and not bearing very closely the ordinary aspect of either a chapel or a church — economy — architectural merit—and an original treatment were accordingly what I had to seek for, in combination of course with the essential points of a useful, well-arranged, well-lighted, and easily approached public building. If a design, in the main, uniting these requirements presented itself, I felt that this was the one which best complied with your instructions, even though in less important matters it was open to some improvement. As the result of my examination of the plans, I beg to recommend that the first premium be given to the design submitted by Messrs. Goddard and Paget; the second to that of Mr. Willoughby; the third to that of Mr. Tait (marked A). In recommending the design proposed for the first premium, I am influenced by the following considerations:—1. This design requires less ground to be purchased than many of the others. 2. There is extremely little loss of space, and great compactness of arrangement, with consequent economy. 3. Notwithstanding this compactness, sufficient access for light and air to every part of the buildings appears to me to be provided for, and the approaches, staircases, &c., appear to be well considered. 4. The architectural merits of the design are of a high order, and its originality and striking qualities are unquestionable. Without ornament of a very expensive character, an appearance of richness has been secured. Much skill and taste are shown in the mode in which the masses of the building are handled, and if erected in conformity with these drawings, your building can hardly fail to be striking and effective in appearance both inside and outside, and at the same time would, I believe, be found adapted to the purposes for which you desire to use it. Before leaving this set of plans I will refer to some points which might be urged against the award of the first premium to them. First and chief the classrooms are not in the part to be first built, but in that to be built second. This, however, is due to the place of the lecture hall, which is placed where indicated by the last paragraph of your instructions. When this has been done it becomes impossible to put classrooms over it as described on page 2, and in my judgment the architects were justified in placing them in the next best position. 2. The lecture-hall may be damp, dark, and low. If properly constructed with ventilation under the floor, it may be made perfectly dry. Ample window space is provided. The height though not very great is sufficient, and if you limit cost to a low figure you cannot have lofty rooms. 3. The sittings are calculated at 18in. per sitting, while in some designs 20in. is allowed. Eighteen inches is the width fixed by the Chapel Building Society as sufficient, though a minimum, and if you limit the cost, the design which keeps down the dimensions of every part to the size just sufficient is the one which most truly carries out the instructions. It is open to question however, whether, as the architects calculate their accommodation almost 12 per cent. above your requirements, it would not be wise to reconsider the sittings, supposing a smaller number with more room for each. In my examination of the plans I did not do more than enquire whether I could find that there was room for 1,100 people in the building. 4. There are not separate gallery entrances. The architects have, however, made other provision as your instructions permit, which tends to keep the people distinct. Separate entrances can, however, be made without difficulty. The design which I have placed second, I recommend on account of the good general shape and arrangement of the various portions, and the comparatively economical disposition of the buildings. It, however, occupies much more ground than the one placed first, and is far from equalling it in originality as an architectural design. It is with regret that I have recommended Mr. Tait's design for the third instead of the second place, which, on the following accounts, I should have been glad to give it. It is prepared with extreme care, it does not occupy a very extensive portion of the site, it treats the accommodation in every respect liberally (in fact, rather too liberally for the circumstances), and it shows the work of an experienced hand. Unfortunately, however, design A is reduced from an original design B (which possesses very considerable architectural merit), and has been reduced in a way which has robbed it of nearly the whole of its exterior effect, and quite the whole of the effect internally. Nor is this all. The plan and section of both designs show that it is intended to place the hall and future schools in such close proximity that each would interfere with both the lighting and the ventilation of the other. In a confined site surrounded with houses, such a course sometimes becomes a necessity, but here where the extent and the boundaries of the site are both, to a certain extent, under your control I regard such a disposition of plan as a blemish so serious that it would have prevented my placing even Mr. Tait's design B in a higher place than the second."

The Committee have resolved to employ Messrs. Goddard and Paget to carry out their design.

Hull Borough Lunatic Asylum.—This competition has resulted in Messrs. Smith and Brodrick, of Hull, being awarded the first premium of £100, Messrs. Giles, Gough and Bell, of London, the second of £50, and Messrs. Jacobs and Bohn, of Hull. The plans were examined in the first instance by Mr. Bernard Hartley, on the nomination of the Commissioners in Lunacy, whose selections were: "Argus," estimated cost, £56,000; "Experentia," £58,000; and "Lucidus Ordo," £46,000. Messrs. Smith and Brodrick, the authors of the design marked "Argus," have been appointed architects for the building, on the usual terms.

SCHOOLS OF ART.

Bromsgrove.—The annual meeting and distribution of prizes at this school took place on Wednesday week. The report showed that 81 students attended the school, being nearly the same as last year, but there was a deficiency in the funds—a balance of £29 14s. due to the treasurer at the commencement of the year having increased to £13 17s. 6d., with a further liability of £31 2s. The report of the work done during the year in the school was very satisfactory. Mr. W. A. Coates, the assistant-master, in addition to the award of two third-grade prizes by the department at South Kensington, obtained for the school the full award for painting in the advanced section; Robert Best and Charles Best passed second class in building construction, and twelve of the students passed as having done a satisfactory year's work.

Chesterfield.—The annual distribution of prizes and certificates was presided over by Lord Edward Cavendish, at the Stephenson Memorial Hall, to which the schools have been removed during the past year, on Friday week. The reports showed satisfactory progress; that of Mr. Symmonds, master of the art school, spoke of considerable advance in the character of the studies. The number of students was the same as last year—28 in the morning, and 74 in the evening classes; 1,547 drawings were sent to London for examination, and the work of 13 students was commended; one third-grade prize was awarded, and also three second-grade prizes. At the local examination 78 presented themselves, and 55 papers were successfully worked, of which 28 students took "excellents."

Dorchester.—The yearly exhibition of drawings, and distribution of prizes and certificates to the School of Art students, took place at the Town Hall on Wednesday week. The chairman said the exhibition on the walls was larger in numbers than last year, the composition was better, and the style was better, showing a general improvement. The committee's report showed that 59 students had attended the classes, of whom 30 presented themselves for examination in May. One third-grade prize had been gained by Miss Panton, but in consequence of the new rule coming into operation this year could not be held by that lady, she having already taken a bronze medal; 6 excellents and 12 passes were obtained. The local competitions were decided by Mr. Gill, head master of the Bridport School of Art. In replying to a vote of thanks, the master of the school, Mr. Baker, defended the individual as against the simultaneous mode of teaching, and stated that a class for the study of china-painting would be instituted after the Christmas vacation.

Lancaster.—The annual distribution of prizes and certificates to the successful students in the school of science and art took place on Tuesday week. The report for the school of art showed a slight increase in the number of pupils, now 328. In the third grade examination conducted in London, a prize was awarded to J. Morgan for applied design, and two advanced and one elementary passes were obtained. In the second grade examination 21 passed in free hand and 2 obtained prizes. In model drawing 7 passed and 2 took prizes, and in geometry 6 passed and 5 received prizes, while in plane and solid geometry, building construction and machine drawing, elementary and advanced, there was one pass in each. The school under Mr. Gilbert's superintendence is doing good and steady work in instructing the young in the principles of elementary art. The curriculum of the school now includes a small conservatory of plants for nature painting and analytical botany as applied to design, paintings, objects of art lent by the department, and a regular class for the study of the living model. The science school report presented no special features.

CHIPS.

It is proposed to erect a series of new police-stations for county purposes in Lancashire, at an estimated cost of £4,000 for that at Bootle, £3,000 at Haslingden, £1,000 for improvements to that at Blackpool, and smaller ones for St. Anne's-on-Sea and Alston. The plans for these, as well as for the proposed county offices in Pitt and Bolton-streets, Preston, will be prepared in the offices of the county surveyor for Lancashire.

The opening of a new siding of the Great Northern Railway, from Shepreth station to Messrs. Prime Brothers' brick, tile, and coprolite works, at Barrington, was celebrated last week by a dinner to the workpeople in the latter village.

New middle-class school premises have just been completed in Ballygate-street, Beccles, Suffolk. The schoolroom measures 72ft. by 21ft., and is 16ft. high; the dining-hall is 42ft. by 21ft. and 16ft. high, and above are ranges of dormitories.

Holy Trinity Church, in St. Philips's District, Bristol, was reopened on Sunday week after renovation, including the insertion of a stained-glass window at the west-end, and the erection of new heating apparatus; the latter, which has cost £160, was supplied by Mr. Vincent Skinner, of Bristol.

Building Intelligence.

Bournemouth.—The newly-erected Congregational Church and schools in the Holdenhurst-road were opened on Wednesday week. The building is from plans by Messrs. Kemp-Welch and Pinder, architects, of Bournemouth, and has been constructed by Mr. R. Pike, of Springbourne. The contract was for £4,013, and the total cost will be about £4,610. The work was commenced about twelve months ago, and the memorial stone was laid on the 26th February last. The building consists of basement and ground floor, and is carried out in white brick, with stone dressings and moulded brick reveals to the windows. On the basement is a school-room, 40ft. by 30ft., and four classrooms, with staircase leading to the church and gallery; the church on the ground-floor, is entered by four spacious doors in the front, and one side entrance. The dimensions are 69ft. by 49ft., without the entrances, but including the apse. The interior is divided by two aisles, and there is a gallery running round three sides of the church, the whole building providing seating accommodation for about 650 persons. The pews are of pitch pine, and in the tower, which faces the Holdenhurst-road, and is 90ft. in height, it is proposed to place a four-faced clock; the organ, pulpit, and platform occupy the apse at the south-east end of the building. The place is heated by means of a hot-air apparatus.

Brighton.—The new Soldier's Institute in the Lewes-road, near the Cavalry Barracks, Brighton, was opened last week. The building is a substantial brick structure, and is very commodious. It contains a refreshment-bar, reading, smoking, and class-rooms, a residence for the lady superintendent, and a lecture-hall capable of accommodating nearly 500 people. The Duke of Connaught has given his name to the building, which will be called "The Connaught Institute." The contract was taken by Mr. James Barnes, of North-street, who has carried it out in a very satisfactory manner. The total cost of the premises will be over £3,000, and the work has been superintended by Messrs. Holford and Clayton, of North-street, Brighton, from whose plans the building was erected.

Caerphilly.—The old parish-church of St. Martin having become too dilapidated for use, a new church has just been erected, under the superintendence of Mr. J. Loughborough Pearson, A.R.A., of London, on a piece of land adjoining the old churchyard, and the new edifice was consecrated on Wednesday, the 17th inst., by the Bishop of Llandaff. The original design was prepared by Mr. Buckeridge, and, on his decease, the work was transferred to Mr. Pearson. Early English in style, St. Martin's now consists of nave, chancel, side aisles, north and south transepts, vestry, organ-chamber, and north porch. It is built of Pwllypant and Bath stone, with Bath dressings. The nave has ranges of clerestory lights, and a fine open roof. The seats, free and open, are constructed of American pitch-pine, and seat about 400 persons. The chancel is separated from the nave by a low screen wall, with the customary arch above. The east window has been filled with stained glass, in memory of the late Baroness Windsor, by tenants of the Windsor estates; the Passion is represented in the five lights, with the Prophets at the base, and Christ in His Glory above; the design is by Mr. Powell, and has been carried out by Messrs. Hardman and Son. The altar, pulpit, and alter-desks, are the work of Mr. William John, of St. Fagan's; the altar-cloth is from Messrs. Cox and Sons, of Southampton-street, Strand, and the sanctuary hangings were supplied by Messrs. Jones and Willis, of London and Birmingham. The font is that removed from the old church. The contractors for the new building were Messrs. Wall and Hook, of Brinscombe, Gloucestershire, and the cost has been about £5,000. A portion of the scheme not yet executed, for want of means, is a tower and spire.

Chichester Diocesan Association.—At the quarterly meeting of this Association, held on the 11th inst., the following grants were made: To Edburton, immediate payment of £50 for restoration of Church; second grants of £20 to Lewes St. Michael, and £10 to West Dean for the same purpose; also of £40 to Christ Church, Eastbourne, for new chancel; £100 to Newhaven for new church; and £20 to Woolbedding for restoration. For building parsonages, £50 was voted to Parham, £50 to East Ham, £100 to Portslade St. Andrew, £100 to Brighton St. Mary, and £100 to Roffey. For enlarging schools, £30 to Danehill, and £25 to Old Shoreham.

Child's Ercal. — St. Michael's Church, Child's Ercal, was reopened on Friday week, after restoration from designs by Messrs. Carpenter and Ingelow, architects, the work being intrusted to Mr. Whittingham, of Newport. The south aisle and wall have been restored. A large fissure in the wall between the tower and the doorway, caused, it is supposed, by getting out the foundations of the present tower, has been repaired. Both old and new gables have each been crowned with a Decorated stone cross. The north aisle is new, except the arcade between it and the nave, this having formerly formed part of the north wall of the building. The old north doorway has been taken from its former position under one of the arcades, and placed under a window on the new north aisle. The chancel has been entirely rebuilt and enlarged. In restoring the interior of the south wall the workmen had to remove the plaster, and in doing so discovered a mural picture, representing the martyrdom of Thomas à Becket, which took place in the year 1170, and, probably, was painted in the twelfth or thirteenth century, but, at a subsequent period, was covered over, with the rest of the wall, with a coating of plaster and lime. The columns of the south aisle have been restored with new foundations and bases after the original mouldings. The old oak roof of the nave remains as it was, but the lath-and-plaster ceiling behind which it had been hid, has been removed. Under the east window, and immediately below the sill, is a stone reredos worked in panels, and harmonising with the architectural features of the chancel. On the south side a plain sedilium has been let into the wall.

Halifax.—The School Board have just opened a range of schools at Haugh Shaw, which have cost £7,000, exclusive of land and furniture. The building is adapted for the accommodation of 760 children in three departments. The design is Elizabethan Gothic, of a type prevalent some three hundred years ago. The board are also adding an additional department to Booth Town Schools, which is designed in the First Pointed period. The contracts have been let, and amount to £2,229, and the work is progressing. On Monday week last the Board approved of a plan and design of a school at Lee Mount, to accommodate 650 children. The design is Second Pointed and has a tower over the infants' entrance which occupies a central position on the plan. The estimated cost is £4,500, but is exclusive of land, boundary walls, playgrounds, and furnishing. The architects of the above are Messrs. Leeming and Leeming, of Halifax.

Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels.—At the monthly meeting of this Society, held on the 18th inst., the following grants were made:—Rebuilding on a new site the church at Whitchurch St. Mary, near Cardiff, £200; enlarging Escomb St. John, near Bishop Auckland, £25; enlarging Lutton St. Peter, near Oundle, £20; and enlarging Trewalchmai, St. Morthaiarn, near Llansgefini, Anglesea, £15. Grants were also made from the Special Mission Buildings fund towards building mission churches at Chester, St. Paul, £20; Hendre, in the parish of Llanaelhaiarn, Carnarvon, £40, and towards enlarging the mission buildings at Barbrook Mill, in the parish of Lynton, North Devon, £10.

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The parish-church of St. Paul's, Blandford, which has undergone renovation at a cost of £700, was on Friday week reopened for service. The building has been re-pewed and the walls decorated A handsome pulpit of Sir Christopher Wren's, from the demolished City church of St. Antholin, Queen Victoria-street, has been placed in the church. Mr. A. Green was the builder, and the decorations were carried out in the nave by Mr. W. Stickland, and in the apse by the late Mr. W. Elgar, and his son-in-law, Mr. J. Godfrey.

Mr. Edward Farminer, builder, of Emmanuel-street, Landport, was killed last week, by being thrown out of his trap by a runaway horse. At the inquest, held on Thursday, a verdict of accidental death was returned. Deceased was 55 years of age.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Cases for binding the half-yearly volumes, 2s. each.

Builder. (If due precautions were taken, the walls between the two houses should have been dry by this time. We should advise coke fires and the gas to be left burning. In reference to your second question, the sketch with raised ventilator would be best. A pitch of about one-third would do. Tiles or felt would be the right covering. The latter is the warmest in winter, being a bad conductor of heat, and would be desirable if the cages are to be placed close to roof. A boarded floor would be the best.)—X. Y. Z. (We can say nothing till we see the drawing of which you speak.)

Drawings Received. — And Dewar, Halifax, Nova Scotia, A. F. Oakey, New York City (neither of these drawings are quite suitable for our purpose). J. F. S., T. G. J., A. G. J., Dublin, No. 90, J. Ogmore, P. and B.

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Correspondence.

MR. NORMAN SHAW'S SOIL-PIPE.

To the Editor of the Building News.

Sir,—We have had over one hundred of Mr. Norman Shaw's open soil-pipes in use on this estate this winter, and not one affected by the frost, which has been intense.—I am, &c.,

J. W. T. Carr.

Bedford Park, Chiswick, Dec. 18.

FUTURE OF PORTLAND CEMENT.

Sir,—May I be permitted to explain to your correspondent "B" upon the subject of the efflorescence of Portland cement? It is probable some Portland cement does contain so much soda and sulphur that an efflorescent sodium sulphate will be produced when it is used neat; but in my experience, it is more usual to find a more abundant supply of efflorescent salt is produced when the cement is used along with building materials containing salt, and that a neat cement which showed no signs of efflorescence, yet may, when used in building operations, show efflorescence. It is satisfactory to know, with care in the selection of the cement and building materials, cement work can be carried out free from efflorescence,—I am, &c., A. C. P.

Parkstone, Dorset, 20th Dec.

THE EASTBOURNE TOWN-HALL COMPETITION.

Sir,—I have no intention of entering into controversy with my professional brethren on the competition question, still less to show the slightest partiality for one particular class or institution, and regret if my letter to the local board in any way appeared to some of your correspondents to bear that interpretation.

Two objects I earnestly hope to see attained, and intend to work for that end.

First—That the "Fellows" of the Institute and elder members of the profession should refrain from engaging in any open competition.

Second—That those members should use their influence and do all in their power to place the competition system on a more healthy footing, for the sake of the younger members, many of whom are clearly of opinion that advantages accrue from "open competition."

As regards the Eastbourne Town Hall, a selection of half-a-dozen or a dozen out of the 240 applicants would have saved the profession from a vast amount of unnecessary labour, expense, and bitter disappointment, and the only object of my mentioning the Institute and the Architectural Association was to secure a fair proportion of invitations being given to the younger architects. The *local* architects, of course, should not have been forgotten in any selection that might have been made.—I am, &c., Thomas Porter.

2, Westminster Chambers, 20th Dec.

RESTORATION AT ST. ALBAN'S.

Sir,—In your issue of the 13th inst. is Mr. White's reiteration of his strange idea of a Norman corbel-table, changed by him into *mediæval*, whatever that may mean, architecturally. He affects to believe, and would make others do the same, that I took my section, published by you, from another part of the building. I can only say, for the information of the public interested in the conservation of ancient remains, that the section I gave was from a portion of the ancient corbel-table over the three eastern bays on the south side of the nave, to which Mr. White first alluded, and that the old pieces of stone still remain there.

Mr. White challenges the accuracy of this—I cannot help his hallucination, but I am certain the public will not be misled by his assertion. Let anyone interested come and see.—I am, &c.,

St. Alban's, 22nd Dec. John Chapple.

EDINBURGH ROYAL INFIRMARY.

Sir,—In your impression of the 19th inst. of the Building News I observe, on p. 738, in a paragraph on the New Infirmary Buildings, Edinburgh, that the cost is stated at £35,000. I suppose it is a slip, and should be at £350,000, which is nearer the amount of cost.—I am, &c., John Bryce.

A SUBTERRANEAN PALACE.

Sir,—In your paper of the 19th instant an article appears headed "Subterranean Palace," detailing the vast underground tunnels, library, and other rooms constructed by His Grace the Duke of Portland. As no mention is made of the means by which all these works were rendered impervious to moisture, I solicit the favour of your noticing the fact that from 1869 to the present year a staff of this company's men were employed in encasing the whole in Pyrimont asphalte.—I am, &c.,

Dec. 23. J. Farrell, Secretary.

CHIPS.

The new public hall at Walton, Surrey, was to be opened by a concert last Tuesday evening, the 23rd inst.

A new bridge has just been completed at Pyrford for the Guildford highway board. The specifications were prepared, and the work was superintended, by Mr. Stevens.

The annual distribution of prizes and certificates to the students in the science and art classes at the Avenham Institution, Preston, took place on Thursday night. The report spoke of another successful year's teaching, and added that since the Institution classes were formed 900 prizes had been awarded to students, including one £50 royal exhibition, one £50 national scholarship in the Art Training School, one £50 scholarship at the South Kensington for proficiency in mechanics, six Queen's prizes, and fifty-one medals.

Intercommunication.

QUESTIONS.

[5990.]—**Antiquities of America.**—Are there any illustrated works on the architectural antiquities of South and Central America, and Mexico, more particularly those of Cusco, Copan, Palenque, and Mittan?—W.H.B., Hull.

[5991.]—**Damp-Proof Course.**—Will some kind reader please say what are the best materials for damp coursing (top of foundations), and the correct proportion of the same, and if the same would do for "dipping" the bottom of posts to prevent them rotting, and oblige—H. V.

[5992.]—**Right of Way.**—Can any reader inform me as to valuing a right of way which a company is about depriving tenants of? The right of way is into a field from middle-class houses. What books can be consulted?—Omega.

[5993.]—**Engineers' Certificate.**—A small town in north of Scotland has executed a sewage scheme. The engineer granted a certificate to the contractor certifying the works finished, and also certifying his account. The local authority refused to honour these certificates, and informed engineer that works were not finished to plans or specifications, and asking him to examine and reconsider his report. Engineer did so, with the result that he withdrew his report and certificate, and requested contractor to make works good. Contractor refused, and holds certificate granted can't be withdrawn. Case has been in court and judge signified that certificate can't be withdrawn. But that case might be appealed. He also says local authority can fall back and recover from engineer. Engineer pleads certificate was granted in error, and by misrepresentation of contractor. Can any kind reader inform subscriber of any parallel case? Can L. A. recover from engineer?—Engineer.

[5994.]—**Vulcanite Set-Squares.**—Can any of your readers inform me if it is possible to mend vulcanite set-squares when once cracked? Do they throw a line out of the perpendicular when warped?—G. S. F.

[5995.]—**Damp Walls.**—My passage, the outer wall of which is exposed, shows signs of dampness along it, about 2ft. from the floor, and I cannot repaper till it is perfectly dry. Will any practical reader inform me of something to put over the plastering to permit of papering? I know there is the petrifying liquid and the tinfoil, but both these have failed. I am also aware that the most effective remedy would be to knock off the plaster and board upon battens, but I want to know if there is not some recent application or solution that may be used.—G.

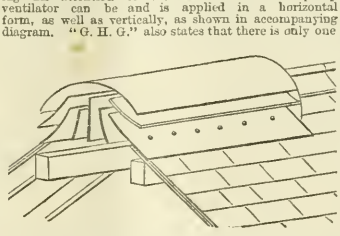
[5996.]—**Gas Regulators.**—I want to know of the name of a good regulator that can be applied either above the meters or near the burners.—Gas Consumer.

[5997.]—**Symbolism.**—Where can I obtain a list of the emblems generally adopted by the medical artists in representations of the Apostles?—H.

[5998.]—**Indian Ink.**—Will any subscriber kindly inform me of any means of extracting Indian ink from drawing-paper, independent of the knife or ink eraser? Perhaps there may be some chemical, such as chloride of lime, for taking out carmine.—Shop.

REPLIES.

[5956.]—**Deflecting Ventilators.**—It affords us great pleasure to have such a favourable opinion expressed on our air-pump ventilators by such a competent authority as "G. H. G.," in his reply to "J. R.," but to prevent misconception, we take the liberty of drawing his attention to the fact that the air-pump ventilator can be and is applied in a horizontal form, as well as vertically, as shown in accompanying diagram. "G. H. G." also states that there is only one fault he has to find against the air-pump ventilator, viz., "that it is made in various ornamental forms," whereas, in his opinion, a ventilator should be perfectly plain and simple, and appear to the eye what it really is. This, of course, is a mere matter of taste, and perhaps, in a strict practical sense, "G. H. G." is right; but our experience is that architects, as a rule, object to introduce anything into their elevations which does not harmonise with the style of the building, and appear as part and parcel of the design. It was this knowledge which induced us to produce the sheet of ornamental designs which appeared in the Building News, and which we published solely to meet the requirements of architects, and supply what we knew to be a felt want. The ornamental portions of the ventilator do not interfere in the slightest degree with the working part, so that no loss is sustained so far as efficiency is concerned. At the same time the ventilator can be made as "G. H. G." prefers it, in the form of a plain cylinder, with a conical top, so that all tastes can be accommodated.—Robert Boyle and Son.



[5959.]—**Brown Ink.**—In reply to "J. G.'s" query, what I mean by "lining up" is perhaps more correctly termed "lining in." I colour my drawings usually when merely in pencil, taking great care to keep them thoroughly clean by covering with white paper, &c., and only resort to the use of the drawing-pen and brown ink or colour in order to sharpen the prominent parts towards the foreground. Unless absolutely necessary for the sake of effect, I prefer not to line with ink, &c., at all, but let the ordinary shading with the sables give the desired modelling of the building represented. The picture will have a much softer and less "scratching" appearance. Respecting geometrical elevations, on receipt of a communication from "J. G." I will give what information I can.—F. N. Pettingell, Spring Bank, Hull.

[5981.]—**Overhead Stables.**—"A Subscriber" should try and view the stables of the Duke of Sutherland in Little St. James's-street. They were designed in 1840 by the late Sir Charles Barry. The stables are approached by two inclines. In front of the stables are galleries or balconies, upon which the horses are brought out to be washed. The stable-yard, coach-houses, inclines, stalls, and gallery floors, were laid at the date named.—Seyssel Asphalte.

[5981.]—**Overhead Stables.**—I should advise "Subscriber" to introduce rolled iron joists and arch in brick between. The upper surface can be covered with concrete and cemented or pitched in the usual way. The gutters can be formed or filled up to (if of iron) in the concrete.—G. H.

[5982.]—**Extras.**—"X. L." does not say whether he has signed a contract, and if so, what the terms are; everything would depend on this. If the architect fraudulently withholds certificates from builder, the latter can claim damages in a court of law. Such cases have been decided. The question is whether the "extras" have been ordered in writing, or whether builder can produce anything to show the work was ordered. If he can, and the architect withholds payment, builder can claim interest or sue for damages.—G.

[5986.]—**Sanitary Institute of Great Britain.**—An "Architectural Assistant" had better read up the Public Health Act and amendments, the by-laws of the Local Government Board, and the "Suggestions" issued by that authority relating to main sewerage, drainage, and water supply, by R. Rawlinson, C.E. He may also profitably read the papers and discussions published in the Society of Arts' Journal on disposal of sewage, water supply, &c., which were brought before the recent Congresses. Many of the papers and discussions will be found reported in the Building News. Of course the principles and practice of sanitary engineering should be studied. Such books as that published by Mr. Baldwin Latham on "Sewerage," &c., should be read. There is a small treatise on "Sanitary Work," by Slagg, published by Mr. W. Lockwood, that will be found useful. The reports of sanitary authorities should be consulted, as they will furnish a clue to the kind of studies necessary. I shall be glad to afford "Assistant" any further information in my power.—G. H. G.

LEGAL INTELLIGENCE.

The Queen v. the Institution of Civil Engineers.—Mr. Justice Field delivered the following important judgment last week, in the Queen's Bench Division:—This is a case stated by the Court of Quarter Sessions for the County of Middlesex, and the question asked of us by the Court is whether the respondents are entitled to claim exemption from the payment of their share of the money to be raised by local taxation on the ground that they are exempted from rateability by the operation of the Act of 6 and 7 Vic. c. 36, as a society instituted exclusively for the "purposes of science, literature, or the fine arts," and whether the premises occupied by the appellants were at the time of the rate exclusively used for any of such purposes. Upon the argument, the numerous cases in which the statute had been the subject of judicial decision were ably and succinctly brought before us, and although at the time of the argument I entertained very little doubt as to what my decision ought to be, I have considered it right to go carefully through the authorities before delivering my judgment. The result is to make the case, to my mind, a very plain one. The clear object of the Act, although, as has been observed, the language of it is not as definite as it might have been, is to encourage people to associate together and by voluntary subscriptions to raise a fund by means of which subjects of science, literature, and the fine arts may be discussed, and a knowledge of them widely diffused, so as to extend and promote the general knowledge and refinement of society at large. Whether such a result should have been sought at the expense of a limited area of the body politic, rather than by imperial taxation, is not the question. The statute has said that such is to be the case, and we have only to construe its meaning. The object, however, of the enactment had its limitation exclusively to matters of science which may be useful or of advantage to the body at large, and not to the advantage or pleasure of any particular body or association, as shown by the prohibition of any dividend or personal gain to the members of the body. It is further made clear that the language of the enactment is large enough to include with purposes of science and literature all science and literature, whether abstract and pure, or applied to any particular object. Yet, in dealing with art, which, without any addition, might mean either pure "art," or an art or mystery, professional or handicraft, the Legislature adds the limitation "fine" art to point the limitation I have adverted to. In the case of art, therefore, the limited object of the statute is clearly expressed, and so in the case of science and literature the same limitation ought to prevail. In the hands of the philosopher and man of science and literature, science, although gradually applied for the purpose of experiment and advancement of the general state of knowledge, is so applied without any material or substantial intention of advantage or gain or of enjoyment by the individual; whereas "science" seems to me to cease to be science within the meaning of the exemption when it is acquired, communicated, or made use of for the purpose of being applied or used for the individual object, advantage, or gain of the members of the associated body. The "science," as applied by the manufacturer or engineer, is still science generally, but is not science which the Legislature intended to exempt from local taxation. That this is so is, I think, clear upon principle, and the authorities cited do, as a whole, bear out this view. No doubt it has been thought that the Court of Queen's Bench, in some of the earlier cases, carried the exemption at least to its furthest limits, but all the latter cases are in favour of its stricter limitation. The application of the rule, therefore, becomes in each case a question of fact. What is the purpose of the institution claiming exemption? Is it instituted purely or exclusively for the purposes of "science" as I have defined it, or is it instituted mainly and substantially for the acquisition by enjoyment, advancement, education, or knowledge of the art or profesion of the members composing the institution? It may be put that the discussion of "science" in any shape is as productive of advantage to, as that of literature is of enjoyment by, the individuals who compose the institution. But if the advancement and acquisition of science taken generally is the main and substantial object of the association, than the necessary concomitant of advantage and enjoyment to the individual does not destroy the exemption. And, in like manner, if the primary and substantial purpose of the institution is the advantage and gain of a particular body of professional men, exercising a professional art by which to earn their livelihood, the fact that those objects are gained by the discussion and promotion of such science as if applied to their art will advance their individual and professional interests, will not protect the society from taxation. For the purpose of deciding under which head the institution must be ranged, I have carefully considered the terms of the charter and by-laws, and the purposes for which the premises are used, and I cannot but come to the conclusion that neither the purpose nor the use is within the meaning of the Legislature as giving exemption. I find from the charter and by-laws that it calls itself an institution of civil engineers, of the members and intending members of which profession it is substantially composed, and the slight admixture of persons other than members of that profession, or their pupils, does not destroy that limitation and distinctive character. Again, I find that all the science and literature to which the charter refers converge upon one point—the education and advancement of its members in the particular professional art of a civil engineer, in which they are engaged, and by which they earn, or are to earn, their living. That this is the substantial purpose of the institution, as expounded by the charter and by-laws, is shown by the report of the council, which also shows the purpose for which they "use" the rateable hereditaments, for we find that, out of a gross income of upwards of £11,000, upwards of £5,000 is devoted to the advancement of professional objects and interest. I might point out various other elements of the purposes for which the society's premises are used, which seem to me to tend in the same direction, and which lead me to the conclusion that the ‘science" for the diffusion of which the lectures and papers serve is ancillary to the main purpose and object of the institution. There was, however, one particular use of the premises—viz., that of the Committee of the Benevolent Association, a body which almost admittedly did not come within the exemption upon which I was prepared to express an opinion, if my decision in favour of the appellants rested upon it; but, as my judgment has so much broader a scope, I prefer not to express an opinion upon it. The result, therefore, is that I hold the institution not to be exempt, and give judgment in favour of the respondent parish. Mr. Justice Manisty delivered a separate judgment, arriving at the same conclusion.

Chubb and Sons v. E. Cotterill and Co.—This was a motion on Saturday last before the Master of the Rolls for judgment, the defendants having been restrained by injunction from publishing the copyright illustrations and letterpress of the plaintiff's trade catalogue of locks and safe-rooms. The plaintiffs are the manufacturers of Chubbs' locks in the City, and for the purpose of promoting their business they published catalogues, which contained designs or drawings of articles manufactured by them accompanied by descriptive letterpress. There were several editions of the work, the last of which was registered in July 1879. The defendants were also manufacturers of locks, keys, safes, strong rooms, and other articles, and they published in June, 1876, books of designs, entitled "E. Cotterill and Co.'s unpickable and powder-proof acme and climax locks," with descriptive letterpress. The designs and letterpress were similar to the catalogue of the plaintiffs, and, it was alleged, were in many instances a distinct copy. The plaintiffs averred that these books were of great value to them, and by the publication of the defendants' trade lists they had sustained damage. The Court, when the case was heard before the Long Vacation, restrained the defendants from issuing or circulating any more of their trade lists till the hearing of the action.—Mr. Short, who appeared for the plaintiffs, now asked for judgment and costs, as the defendants conseuted to the adoption of that course.—The Master of the Rolls: Very well.—Order accordingly for judgment as asked, with costs.

Architects and School Boards.—At the Liskeard County Court last week, the judge (Mr. Montagu Bere, Q.C.,) gave judgment in the action brought by the Talland and Lansallos United District School Board against Mr. Silvanus Trevail, of Tywardreath, to recover £30 9s. 7d. for money alleged to be overpaid defendant whilst acting as architect for the plaintiffs. The action, which was reported in our issue of November 21, was tried before a jury at the November Court, who found for Mr. Trevail to the extent of £31 10s. 4d. The judge, however, reserved his judgment on certain legal points. He now gave judgment for the defendant, on the ground that the School Board was a corporate body with a seal, but they did not use it upon the appointment of the defendant as architect. The appointment required the seal to be affixed. The defendant's solicitor afterwards applied for costs, which were allowed.

Our Office Table.

A loan collection of etchings and engravings belonging to the Duke of Buccleugh is now on exhibition at the Edinburgh Museum of Science and Art. The collection embraces in all 390 works of art, including the "Liber Studiorum," of Turner, etchings by Rembrandt and Adrian, Van Ostade, and a few examples of Antonio. A very interesting part of the collection is a series of 215 portraits from copper plates, representing famous characters, from 1068 to the beginning of the 17th century. The engravings had evidently been published in book form, and the title-page of the work, which is exhibited, bearing the date 1618. The book contains a series of portraits of the sovereigns of England, from William the Conqueror to the date of issue, and also of James IV. of Scotland, Mary Stuart, Queen of Scots, and Lord Darnley.

The committee of the Parkes Museum and the council of the Working Men's Club and Institute Union have arranged for a series of demonstrations to working men on Saturday afternoons, commencing on January 3, when Professor Corfield will explain the uses of the many appliances connected with house-drainage which are in the Museum. The subsequent demonstration, will be on "Ventilating, Lighting, and Warming," by Professor Corfield; "Food," by Dr. G. V. Poore; and "The Hospital and Sick Room," by Dr. T. C. Steele.

The first number of Mr. Walford's new magazine, *The Antiquary*, reaches us just as we are going to press. It is antiquarian to the very paper and priut, and the list of contributors is a fairly respectable one. The best papers in the number seem Dr. Hayman's "Historical Memories of Tewkesbury Abbey," and Mr. Henfrey's "Canterbury Coins of Edward I., II., and III. The prologue in verse, by Austin Dobson, pleasantly prefaces Mr. Walford's new venture, to which we wish all success.

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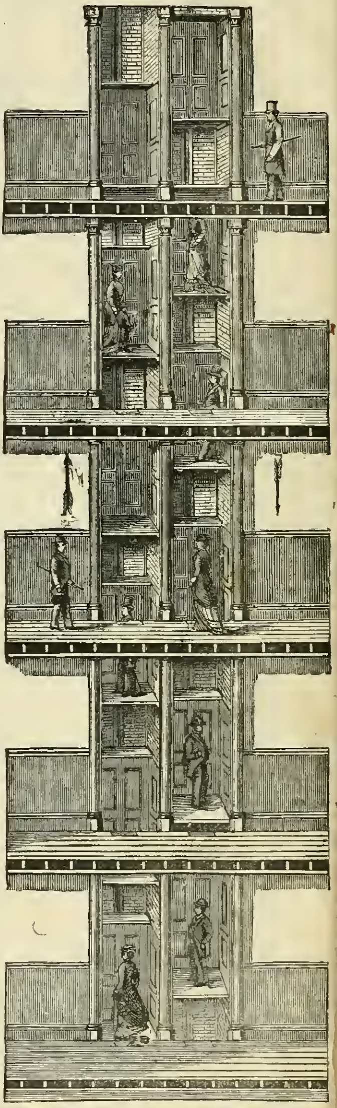

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